Alton Estate Regeneration
Hybrid Application

ENVIRONMENTAL STATEMENT: VOLUME 1 - MAIN TEXT AND FIGURES

Barton Willmore LLP
May 2019

REDROW

Alton Estate, Roehampton

Environmental Statement Volume 1

Main Text and Figures

Prepared by Barton Willmore on behalf of Redrow Homes Limited

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ABBREVIATIONS

AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
AEI	Average Exposure Indicator
ANC	Association of Noise Consultants
AOD	Above Ordnance Datum
APS	Annual Population Survey
APSH	Annual Probable Sunlight Hours
APVRA	Alton and Putney Vale Regeneration Area
ATC	Automatic Traffic Count
AQAP	Air Quality Action Plan
AQDMP	Air Quality and Dust Management Plan
AQMA	Air Quality Management Area
BAP	Biodiversity Action Plan
BoCC	Birds of Conservation Concern
BPM	Best Practice Means
BRE	Building Research Establishment
BS	British Standard
CEMP	Construction Environmental Management Plan
CFD	Computational Fluid Dynamics
CIEEM	Chartered Institute of Ecology and Environmental Management
CIEH	Chartered Institute of Environmental Health
CITB	Construction Industry Training Board
CLP	Construction Logistics Plan
CNVMP	Construction Noise and Vibration Management Plan
CRTN	Calculation of Road Traffic Noise
DCMS	Department for Culture, Media and Sport
DEFRA	Department for Environment, Food and Rural Affairs
DHN	District Heat Network
DMPD	Development Management Policies Document
DMRB	Design Manual for Roads and Bridges
DoE	Department of the Environment
EA	Environment Agency
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
EFT	Emission Factor Toolkit
EPA	Environmental Protection Act
EPUK	Environmental Protection UK
ES	Environmental Statement
EU	European Union
EVCPs	Electric Vehicle Charging Points
FTE	Full-time Equivalent
GCN	Great Crested Newt
GIA	Gross Internal Area
GLA	Greater London Authority
GLHER	Greater London Historic Environment Record
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GP	General Practitioner
GPA	Good Practice Advice
GVA	Gross Value Added
Ha	Hectares
HAM	Highway Assignment Model
HDVs	Heavy Duty Vehicles
HER	Historic Environment Record

HRSA	Habitat Regulations Screening Assessment
HSI	Habitat Suitability Index
HUDU	Health Urban Development Unit
IEMA	Institute of Environmental Assessment and Management
IGS	Institute of Geological Sciences
ILP	Institute of Lighting Professionals
IMD	Index of Multiple Deprivation
IOA	Institute of Acoustics
JNCC	Joint Nature Conservation Committee
JSA	Job Seeker Allowance
Km	Kilometre
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LBR	London Borough of Richmond
LBW	London Borough of Wandsworth
LCC	London County Council
LDVs	Light Duty Vehicles
LEAPs	Local Equipped Areas for Play
LFT	Labour Forecasting Tool
LMA	London Metropolitan Archives
LNR	Local Nature Reserve
LSOAs	Lower Super Output Areas
LPA	Local Planning Authority
m	Metres
MAGIC	Multi Agency Geographic Information for the Countryside
MTS	Mayors Transport Strategy
MCC	Manual Turning Count
MYPE	Mid-Year Population Estimates
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LSOA	Lower Super Output Areas
NAQOs	National Air Quality Objectives
NE	Natural England
NEAPs	Neighbourhood Equipped Areas for Play
NHS	National Health Service
NIA	Net Internal Area
NMR	National Monument Record
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide
HP&G	Historic Park and Garden
NNR	National Nature Reserve
NOEL	No Observed Effect Level
NPFA	National Playing Fields Association
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NRMM	Non-road Mobile Machinery
NSL	No Sky Line
NTS	Non-Technical Summary
ONS	Office for National Statistics
OS	Ordnance Survey
PBRA	Preliminary Bat Roost Assessment
PEA	Preliminary Ecological Appraisal
PIA	Personal Injury Accident
PM_{10} and $PM_{2.5}$	Particulate Matter
PPG	Planning Policy Guidance
PRFs	Potential Roost Features
ProPG	Professional Practice Guidance on Planning and Noise

PROW	Public Right of Way
RIBA	Royal Institute of British Architects
RPG	Registered Park & Garden
SA	Sustainability Appraisal
SAC	Special Area of Conservation
SBINC	Sites of Borough Importance
SEL	Sound Exposure Level
SINC	Site of Importance for Nature Conservation
SLINC	Sites of Local Importance
SMINC	Site of Nature Conservation Importance
SNPP	Sub-National Population Projections
SOAEL	Significant Observed Adverse Effect Level
SPA	Special Protection Area
SPD	Supplementary Planning Document
SPG	Supplementary Planning Guidance
SSAD	Site Specific Allocations Document
SSSI	Site of Specific Scientific Interest
SPD	Supplementary Planning Document
SPZ	Source Protection Zone
sqm	Square metres
SuDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
TCA	Townscape Character Area
TEBs	Transport Emission Benchmarks
TfL	Transport for London
TLRN	TfL Road Network
µg/m3	micrograms per cubic metre
ULR	Upward Light Ratio
UNECE	United Nations Economic Commission for Europe
UXO	Unexploded Ordnance
VSC	Vertical Sky Component
WHO	World Health Organisation
WSI	Written Scheme of Investigation
ZOI	Zone of Influence

GLOSSARY

Within this Environmental Statement the following terms are defined as follows:

Above Ordnance Datum	Ordnance Datum is the vertical datum used by ordnance survey as the basis for deriving altitudes on maps. Topography may be described using the level in comparison or 'above' ordnance datum.
Applicant	Redrow Homes Limited
Site	Alton Estate, Roehampton
Aquifer	A geological formation (soil or rock) which is able to store water in significant quantities and transmit water relatively quickly under natural conditions (or when pumped).
Baseline	Environmental conditions at specific periods of time, present on, or near a site, against which future changes may be measured or predicted.
Biodiversity	Abbreviated form of 'biological diversity'.
Completed Development	Within the ES this phase refers to the Development when fully built and operational.
Considerate Contractors	Contractors who are compliant with the Considerate Contractors scheme can be considered as a contractor who is clean, respectful, safe, environmentally conscious, responsible and accountable.
Construction	Within the ES this phrase refers to all construction works associated with the Development. Demolition and construction of the Development is anticipated to commence in 2020, subject to gaining planning permission, and span approximately 10 years. Overall, the demolition and construction process is expected to be completed by 2030.
Construction Liaison Officer	A designated liaison officer who will deal with public and other complaints and enquiries during the construction phase.
County Wildlife Site	County Wildlife Site (CWS) are areas of land that are rich in wildlife such as a tract of heath, a meadow, a copse or a village pond.
Cumulative effects	The summation of effects that result from changes caused by a development in conjunction with other past, present or reasonably foreseeable actions.
Development	a) A *Phased demolition of all existing buildings and structures (except Alton Activity Centre community building);* b) *Mixed-use phased development ranging from 1-9 storeys above ground level comprising up to 1,103 residential units and up to 9,572 sqm (GIA) of non-residential uses comprising new and replacement community facilities (including enhanced library and healthcare facilities, youth facilities, community hall, children's nursery & children's centre) (Class D1); flexible commercial floorspace (comprising retail (Class A1), financial and professional services (Class A2), café / restaurants (Class A3), hot-food takeaways (Class A5), business (Class B1), and community uses (Class D1)); landscaping; removal and replacement of trees; public realm improvements; access improvements; relocation of bus turnaround area; improvements to children's play facilities; provision of energy centre; car & cycle parking; and other highway works*

	incidental to the development. All matters reserved except for Blocks A, K, M, N, O, Q, Portswood Place Nursery and Community Centre and highway/landscape/public realm improvements.
Effect	A physical or measurable change to the environment attributable to the project.
EIA Regulations	The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)[1].
Environmental Impact Assessment (EIA)	A systematic means of assessing a development project's likely significant environmental effects.
Environmental Statement (ES)	Statutory report summarising the findings of an environmental impact assessment.
Field Pattern	The pattern of hedges, fences and walls that define fields in farmed landscapes.
Flood Risk Assessment (FRA)	A desk-based study which considers the contributing factors and predicts / quantifies the risk of flooding and also identifies a water level in the event of flooding.
Habitat	The environment in which populations or individual species live or grow.
Landscape Character	The distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement. It creates the particular sense of place of different areas of the landscape.
Landscape Effects	Change in the elements, characteristics, character and qualities of the landscape as a result of development.
Landscape Sensitivity	The extent to which a landscape can accept change of a particular type and scale without unacceptable adverse effects on its character.
Light spill	The unwanted spillage of light on to adjacent areas and may affect or cause nuisance to sensitive receptors, particularly residential properties and natural habitats.
Local Nature Reserve	Local Nature Reserve (LNR) are places with wildlife or geological features that are of special interest locally.
Mitigation Measures	Actions proposed to moderate adverse effects arising from the whole or specific elements of a development including any process, activity or design to avoid, reduce, remedy or compensate for adverse environmental effects of a development project.
Non-Technical Summary	A report which briefly describes the main points discussed in the Environmental Statement in a clear manner, without the use of technical jargon and phraseology.
Phase 1 Habitat Survey	An ecological survey technique that provides a standardised system to record vegetation and wildlife habitats. It enables a basic assessment of habitat type and its potential importance for nature conservation. Each habitat type or feature is identified and presented on a map.

[1] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (No. 571)

Public Open Space	Open space, designated by a local authority, defined where public access is generally not formally established, but which fulfils or is capable of fulfilling a recreational and/or non-recreational role (for example, amenity, ecological, educational, social or cultural). It includes most nature reserves, city farms, cemeteries, reservoirs (including covered reservoirs) and some private institutional and housing estate grounds which are not considered suitable for building development. Public Open Space does not include school playing fields nor the amenity areas associated with the development of homes or flats or pedestrian precincts (Local Government Act 1966 Section 8).
Public Right of Way (PROW)	A right of passage by the public over the surface of the land without impediment. Public Rights of Way include public footpaths, bridleways and byways open to all traffic and Restricted Byways.
Receptor	A component of the natural, created or built environment such as human being, water, air, a building, or a plant that has the potential to be affected by the Proposed Development.
Residual Effects	Those effects of a development that cannot be mitigated following implementation of mitigation proposals.
Scoping	An exercise undertaken to determine the topics to be addressed within the Environmental Statement.
Screening	Consideration as to whether an environmental impact assessment is required for a project.
Section 106 Agreement	Section 106 (S106) of the Town and Country Planning Act 1990 allows a local planning authority (LPA) to enter into a legally-binding agreement or planning obligation with a landowner in association with the granting of planning permission. The obligation is termed a Section 106 Agreement.
Site of Nature Conservation Importance (SNCI)	Sites of Nature Conservation Importance (SNCI) are amongst the best sites for wildlife in the County. They are a comprehensive suite of local wildlife sites that are of high value for biodiversity, with habitats and species that are uncommon in the County and sometimes further afield.
Site of Special Scientific Interest (SSSI)	The nature conservation agencies have a duty under the Wildlife and Countryside Act 1981, as amended, to notify any area of land which in their opinion is 'of special interest by reason of any of its flora, fauna, or geological or physiographical features'. Such areas are known as Sites of Special Scientific Interest (SSSIs).
Sky glow	The upward spill of light into the sky which can cause a glowing effect and is often seen above cities when viewed from a dark area.
Special Landscape Area	Special Landscape Areas comprise traditional features, such as a pattern of small fields formed by hedgerows, ditches and ponds and interspersed with ancient woodland, which create a landscape of interest and variety and provides a diversity of habitat that is essential for wildlife.
Sustainable Drainage System (SuDS)	Sustainable management practices designed to control the rate and quality of surface water runoff into receiving waters, for example the use of swales and wetlands as buffers, as opposed to conventional drainage practices.
Topography	The natural or artificial features, level and surface form of the ground surface.

Tree Preservation Order	A Tree Preservation Order (TPO) is a legally enforceable order made by the Local Planning Authority (LPA) to protect trees and woodland in the interests of public amenity. The power to make a TPO is contained in the Town and Country Planning Act 1990 and the Town and Country (Tree Preservation) (England) Regulations 2012. The principal effect of a TPO is to prohibit the cutting down, uprooting, topping, lopping, uprooting, wilful damage to or wilful destruction of protected trees or woodlands unless permission has been given by the LPA.
Visual Effect	Change in the appearance of the landscape from available viewpoints as a result of development.

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 1 Introduction

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1.0 INTRODUCTION

1.1 Redrow Homes Ltd (the "Applicant"), is submitting a hybrid planning application for demolition of existing buildings and erection of up to 1,103 dwellings, new and replacement community facilities, flexible commercial floorspace, new and replacement play facilities and associated hard and soft landscaping, public realm and access improvements, parking, servicing, and other associated works (the Development) at part of the Alton Estates, Roehampton (the Site). Located within the administrative area of the London Borough of Wandsworth (LBW), the Site extends to 12.50 hectares (ha) and is shown on Figure 1.1. A full description of the Site and Development is provided in Chapter 3 of this Environmental Statement (ES).

Requirement for EIA

1.2 The Environmental Impact Assessment (EIA) process is the mechanism by which development proposals are appraised in terms of their likely significant environmental effects. EIA is described as a means of drawing together, in a systematic way, an assessment of a development's likely significant environmental effects (beneficial and adverse). This helps to ensure that the importance of the predicted significant environmental effects, and the scope for reducing them, are properly understood before a decision is made. Information on the likely significant effects of the Development has been gathered and is presented in this document, the ES. The ES will inform the decision-maker (in this case LBW) of the likely significant environmental effects of the Development both during construction and operation, and proposes mitigation measures to prevent, reduce or offset any significant adverse effects on the environment.

1.3 The Development falls within Category 10(b) of Schedule 2 of the *Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)*[i] as an urban project where the area of the development exceeds 5 hectares and includes more than 150 dwellings. An EIA Screening Opinion was sought from LBW in September 2018 and LBW subsequently confirmed that an EIA was required as part of the planning application. It is considered that the Development could lead to significant effects on the environment and an ES, informed through the EIA Screening and Scoping process (see Chapter 2 for further details), has been prepared in support of the planning application.

Organisation of the Environmental Statement

1.4 Regulation 18 of the EIA Regulations sets out the information an ES should include. Table 1.1 below shows where the Regulation 18 information has been provided in this ES. Appendix 1.1 sets out where the information required by Schedule 4 has been provided in this ES.

Table 1.1: Location of Information within the ES Required by Regulation 18 of the EIA Regulations

Specified Information		Location within ES
Reg 18 (3) An environmental statement is a statement which includes at least—		
(a)	a description of the proposed development comprising information on the site, design, size and other relevant features of the development;	Chapter 3
(b)	a description of the likely significant effects of the proposed development on the environment;	Technical Chapters 6-13
(c)	a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment	Chapter 3 and Technical Chapters 6-13
(d)	a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment;	Chapter 4
(e)	a non-technical summary of the information referred to in sub-paragraphs (a) to (d);	Separate standalone NTS
(f)	any additional information specified in Schedule 4 relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected	Chapter 3 and Technical Chapters 6-13
Reg 18 (4) An environmental statement must—		
(a)	where a scoping opinion or direction has been issued in accordance with regulation 15 or 16, be based on the most recent scoping opinion or direction issued (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion or direction);	Further information is provided in Chapter 2.
(b)	include the information reasonably required for reaching a reasoned conclusion on the significant effects of the development on the environment, taking into account current knowledge and methods of assessment; and	Technical Chapters 6-13
(c)	be prepared, taking into account the results of any relevant UK environmental assessment, which are reasonably available to the person preparing the environmental statement, with a view to avoiding duplication of assessment.	A Habitat Regulations Screening Assessment (HRSA) has been prepared in conjunction with the Biodiversity ES Chapter.
Reg 18 (5) In order to ensure the completeness and quality of the environmental statement—		
(a)	the developer must ensure that the environmental statement is prepared by competent experts;	Each of contributors to the ES has set out their credentials in the introductory section of their technical assessment chapter.
(b)	the environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.	See Appendix 1.2.

ES Structure

1.5 This ES comprises 14 chapters and is supported by figures (located at the back of each chapter within Volume 1), technical appendices (within a separate Volume 2) and the Transport Assessment (TA) (within a separate Volume 3). A Non-Technical Summary (NTS) of the full ES is provided as a standalone document. Table 1.2 sets out the structure of the ES.

Table 1.2 ES Structure

Volume 1 – Main Text & Figures		
Chapter No.	**Chapter Title**	**Description**
1	Introduction	Introduction to the ES, EIA requirements, details of project team, ES organisation and availability.
2	EIA Methodology	Methods used to prepare each chapter, description of ES structure and content, generic significance criteria, scoping and consultation.
3	Site and Development Description	Site description and details of the Development.
4	Alternatives and Design Evolution	Outline of the main alternatives considered by the Applicant.
5	Construction Methodology and Phasing	Details of anticipated programme for development and construction methodology.
6	Population and Human Health	Consideration of the potential effects on population and human health.
7	Heritage, Townscape and Visual Effects	Effects of the Development on above ground heritage assets and townscape and visual amenity.
8	Archaeology	Effects of the Development on below ground heritage assets.
9	Transport & Access	Assessment of the Transport & Access effects.
10	Air Quality	Assessment of the effects relating to air quality.
11	Noise and Vibration	Effects of the proposed development on noise and vibration.
12	Biodiversity	Assessment of the effect on biodiversity and ecology.
13	Daylight, Sunlight and Overshadowing	Effects relating to daylight, sunlight and overshadowing.
14	Summary and Residual Effects	Summary of the residual and interactive effects of the Development.
Volume 2	**Technical Appendices**	Technical data and reports to support the chapters in Volume 1.
Volume 3	**Transport Assessment**	Transport Assessment, including Parking Management Plan and Travel Plan.
Standalone Document	**Non-Technical Summary**	Summary of the ES in non-technical language.

Project Team

1.6 The ES has been coordinated by Barton Willmore and presents the results of technical studies carried out in conjunction with a number of specialist consultants appointed by the Applicant. The project team is listed in Table 1.3 along with their respective disciplines and contributions to the ES. A 'statement of expertise' as required by Regulation 18 (5) (b) of the EIA Regulations 2017 (as amended) is provided at Appendix 1.2.

Table 1.3 Project Team

Organisation	Expertise
Redrow Homes Ltd	The Applicant
Hawkins Brown and Tate Hindle	Architects
Gillespies	Landscape Design
Barton Willmore	Town Planning, Architects & EIA Project Management, Population & Human Health, Townscape & Visual Effects.
Built Heritage Consultancy	Built Heritage
CgMS	Archaeology
WSP	Biodiversity, ES Volume 3: Transport Assessment
Arup	Transport and Access ES Chapter
PBA	Air Quality
RSK	Noise and Vibration
GIA	Daylight, Sunlight and Overshadowing

Other Documents

1.1 A number of other documents have been submitted to LBW in support of the planning application. These include:

- Planning Statement;
- Affordable Housing Statement;
- Masterplan Statement;
- Design, Landscape and Access Statement;
- Statement of Community Involvement;
- Internal Daylight, Sunlight & Overshadowing Assessment;
- Site Waste Management Plan;
- Foul Sewage and Utilities Assessment;
- Cultural Strategy;
- Decant Strategy;
- Waste Strategy;
- Utilities Appraisal Report;
- Fire Safety Strategy;
- Equalities Impact Needs Assessment; and
- Financial Viability Assessment.

Environmental Statement Availability

1.2 The ES is available for public viewing during normal office hours at the following addresses:

Planning Department
Wandsworth Council

The Town Hall
Wandsworth High Street
London, SW18 2PU

Tel: 020 8871 7620
Email: planning@wandsworth.gov.uk

A further full copy will be made available at the Roehampton Library.

1.3 The ES may be purchased in volumes, the costs for which are set out below:

- Non-Technical Summary (NTS) - £15
- Volume 1: ES Main Text & Figures - £150
- Volume 2: ES Appendices - £350
- Full copy (Volumes 1 and 2 with NTS) of the ES on CD - £15

1.4 For copies of any of the above please contact the Environmental Planning team at Barton Willmore:

Environmental Planning Team
Barton Willmore LLP
7 Soho Square
London, W1D 3QB

Tel: 020 7446 6888
Email: environmental@bartonwillmore.co.uk

References

[i] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (2018 No.695)

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 2 ES Methodology

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2.0 ES METHODOLOGY

Introduction

2.1 This chapter sets out the methodology used to prepare each chapter of the ES and describes its structure and content. In particular, it sets out the process of identifying and assessing the likely significant effects of the Development on the environment.

2.2 The ES has been prepared in accordance with the Town & Country Planning (Environmental Impact Assessment (EIA)) Regulations 2017, as amended (the "EIA Regulations")[i], which implement European Council Directive No. 85/337/EEC as amended by Council Directive No. 97/11/EC.

Scoping

2.3 The Development has been the subject of a scoping exercise to identify the likely significant effects on the environment that may arise from the demolition and construction and operational phases of the Development. An EIA Screening and Scoping Report (Appendix 2.1) was initially submitted to LBW on 28th September 2017. An EIA Scoping Opinion (Appendix 2.2) was received from LBW on 13rd December 2017. A subsequent scoping note (Appendix 2.3) was issued to LBW on 10th January 2018 to clarify a number of points raised in the EIA Scoping Opinion and this was agreed and accepted by LBW on 6th February 2018 (refer to Appendix 2.4). Further clarification was sought on the cumulative schemes for assessment, which was agreed on 23rd February 2019 (refer to Appendix 2.4).

2.4 The results of the request for an EIA Screening and Scoping Opinion identified that the following subject areas should be included in the ES:

- Population and Human Health;
- Heritage, Townscape and Visual Effects;
- Archaeology;
- Transport & Access;
- Air Quality;
- Noise and Vibration;
- Biodiversity; and
- Daylight, Sunlight & Overshadowing.

2.5 The EIA Scoping Opinion also identified that the Development was considered to generate

non-significant effects on the following subject areas:

Water Resources and Flood Risk

2.6 A Flood Risk and Drainage Strategy has been undertaken for the Development (ref: 41753/FRA) (refer to Appendix 2.5). The Site is located in Flood Zone 1 (low probability of fluvial flooding) which is considered to be at low risk from other sources of flooding and there are no significant flood risk effects anticipated from the Development. As part of the Development design, a mitigation Strategy has been developed to ensure that the Development is safe from the risk of flooding. This includes ground levels being set at a minimum of 300mm higher that surrounding ground levels and grading exterior levels away from building entrances. The FRA demonstrates that the Development is safe and in accordance with the requirements of national and local planning policy.

2.7 A Surface water drainage strategy has also been developed and will include the provision of Sustainable Drainage Systems (SuDS) techniques where practicable including consideration of the projected impacts associated with climate change and exceedance events. The Flood Risk Assessment and Drainage Strategy has been agreed with the Environment Agency (EA) and Lead Local Flood Authority (Thames Water) to ensure all operational effects are managed in terms of flood risk and water quality both on and off site. Construction impacts on surface water will be managed in accordance with best practice which will be outlined in any future Construction and Environmental Management Plan (CEMP). No significant effects are anticipated in relation to the water environment and therefore this discipline has been scoped out of the ES.

Agricultural Land

2.8 The Site is currently developed and there will be no loss of agricultural land. This topic has therefore been scoped out of the ES.

Land Contamination

2.9 Given the current Site use, which comprises predominantly residential use, significant effects in relation the land contamination would not be expected. A Preliminary Risk Assessment (ref: 29535R01(01) (refer to Appendix 2.6) has been undertaken for the Site which found no direct evidence of significant ground contamination at the Site. The study recorded the possibility that some shallow made ground may exist on the Site associated with historic and current development of the present-day Site. Prior to redevelopment, a programme of intrusive investigation will be carried out to identify the possible presence, nature and extent of any

contamination within the ground/groundwater. Any contaminated (if present) would be suitably treated prior to Development. Based on the above, likely significant effects are not anticipated and this topic has been scoped out of the ES.

Wind Microclimate

2.10 A pedestrian level Wind Microclimate Assessment has been undertaken for the Development (refer to Appendix 2.7). The report has identified the potential wind microclimate effects on the Development, based on an assessment conducted using Computational Fluid Dynamics (CFD) simulations. The assessment identifies that some parts of the Development may be exposed to prevailing south-westerly winds, which could have channelling effects between Blocks. However, these effects would be relatively isolated and through the use of localised mitigation measures, including the implementation of hard and soft landscaping this would break up wind flow and reduce the potential for adverse wind effects. With the proposed landscaping scheme, it is expected that wind conditions at ground and podium levels of the Development would be suitable for the intended pedestrian uses. Likely significant wind effects from the Development are therefore not anticipated and this topic has been scoped out of the ES.

Lighting

2.11 The Site lies within an existing urbanised area that is considered to lie within the Environmental Zone E3 (suburban), as defined by the Institute of Lighting Professionals. The proposals are not anticipated to produce a significant lighting impact due to the nature of the Development and its context. As such, this topic has been scoped out of the ES.

Waste

2.12 Waste will be generated during the demolition phase of the Development from the removal of existing buildings and infrastructure; through the construction phase from disused construction materials; and through the operational phase from the proposed residential and non-residential land uses.

2.13 To manage construction waste, a Site Waste Management Plan (SWMP) has been prepared and this will be submitted in support of the planning application. Existing buildings and infrastructure on the Site would be removed with much of the materials either reused or recycled for use on or off the Site and this would be identified during the design process.

2.14 An operational Waste Strategy has also been undertaken and is submitted with the planning application. The Waste Strategy considers operational waste for the Development, describing the strategy for each land use and an assessment of waste generation, storage, handling and collection requirements. Operational waste would be disposed of in line with LBW requirements and managed in accordance with all applicable legislation.

2.15 On the basis of the above, likely significant effects of waste generation during the demolition, construction, and operational phases of the Development are not considered to be significant and therefore waste is scoped out of the EIA.

Climate Change and Greenhouse Gases

2.16 Climate change and greenhouse gases, as a separate chapter, has been scoped out of the ES. Chapter 3 summarizes the findings of the ES and the climate change adaptations integrated into the Development. This has drawn upon technical chapters and reports, including the Flood Risk Assessment and Air Quality Assessment and summarizes the sustainability and energy provisions included within the Development.

Accidents and Disasters

2.17 The Development is residential in nature and does not include uses which are considered to be hazardous. The Site is not in a location which is at risk of disasters such as flooding, land instability or earthquakes.

2.18 An unexploded ordnance (UXO) assessment has been undertaken for the Site as part of the Preliminary Risk Assessment (refer to Appendix 2.6). The assessment identifies that the Site is at medium risk of UXO being present. Specific risk mitigation measures are therefore recommended as part of a programme of intrusive investigation prior to Development. This includes site specific UXO awareness briefings to all personnel conducting intrusive works and identifies necessary mitigation identified to deal with risks. For medium risk areas, the following risk mitigation measures are recommended:

- Open Intrusive Works (trial pits, service pits, open excavations, shallow foundations etc.): Non-Intrusive UXO Magnetometer Survey and Target Investigation (where this type of survey is not practical (due to for example terrain or ground conditions), it is recommended that a UXO Specialist is provided to support shallow intrusive works); and
- Boreholes and Piled Foundations: Intrusive Magnetometer Survey of all borehole and pile locations/clusters down to maximum bomb penetration depth.

2.19 In light of the above, no likely significant effects are anticipated and therefore this topic has been scoped out of the ES.

Public Consultation

2.20 The planning application is the culmination of an extensive design process which has involved extensive consultation with LBW, statutory consultees, the local community and other local stakeholders.

2.21 A public exhibition was held in September 2017 at Roehampton Library. Information was on display at the event to explain the background to, and aim of, the Development and show the emerging design and feedback forms were used to gather comments from the public. Chapter 4 summarises how the views of the local community have been taken into account in the design evolution of the Development.

2.22 In addition to the public exhibition, a number of other consultation events have been undertaken, as set out in Table 2.1 below.

Table 2.1 Consultation Programme

Date	Event
July 2017	**Roehampton Festival** Exhibition boards were included at the Roehampton 'Feel Good' Festival held at Downshire Field. These provided information about the September consultation event and provided opportunity for members of the public to sign up for future design workshops. The Applicant and members of the project team were in attendance. Wandworth Council's Regeneration team were also on hand to answer questions.
September 2017	**Consultant-led workshops** A series of 14 workshops on various topics areas were held in Roehampton Parish Hall to generate interest in the regeneration and planning process. Participation in the workshops was actively encouraged in a number of ways, including online at www.AltonEstateRegen.co.uk website.
September & October 2017	**Open sessions at Roehampton Parish Hall** At either end of the public exhibition in September, a number of open sessions were held in Roehampton Parish Hall where members of the project team and representatives from Wandsworth Council were available to discuss the project with local residents.
October 2017	**The young people's workshop** A young people's workshop was arranged in October 2017, enabling the regeneration team to engage with young people living on Alton Estate, and provide the opportunity to expand on some of the issues raised previously and inviting them to make further suggestions.
June 2018	**Consultation Events in June 2018** A number of open sessions were held in Roehampton parish hall where members of the project team and representatives from Wandsworth Council were available to discuss aspects of the project with local residents. The open sessions in the Parish Hall were followed up by pop-up exhibitions held throughout June at Roehampton Library, Downshire Field, Saint Joseph Church,

Date	Event
	Roehampton Lane and Eastwood Children's Centre. A youth consultation meeting was also held on the afternoon on 14th June 2018.
September 2018	**Roehampton Festival** The Applicant attended the 'Get Active' Roehampton Festival with a number of further exhibition boards on display, providing updated information on key aspects of the scheme. The Festival also provided the project team with an opportunity to respond to the questions that were asked most frequently during the exhibitions that took place in June.
November 2018	**Consultation Events in November 2018** Two consultation events were held in November to present the designs for the new bus turnaround along Danebury Avenue close to Portswood Place and the Alton Activity Centre play space. Representatives from LBW and members of the project team were available to respond to questions from residents.
2017 & 2018	**Direct Engagement** A programme of direct engagement was also implemented which involved members of the regeneration team going out into the community and organising a series of meetings and briefings with community groups, youth organisations, faith groups, schools and businesses at venues on and around the Alton Estate.

2.23 Further details in relation to the public consultation exercise undertaken for the Development is provided within the Statement of Community Involvement, submitted separately in support of the planning application.

2.24 In addition to consultation with LBW (various departments), the Wandsworth Design Review Panel, target groups, local organisations and individuals, consultation has also been undertaken with the following statutory consultees:

- Natural England;
- Historic England;
- 20th Century Society;
- London Parks and Gardens Trust;
- Royal Parks;
- London Borough of Richmond;
- Environment Agency;
- Thames Water;
- Greater London Authority;
- Metropolitan Police; and
- Transport for London (TfL).

Approach to Technical Studies

2.25 The EIA studies commenced at an early stage in the development process. The findings of these baseline environmental studies have played an important role in the design of the

Development by defining the environmental sensitivities, constraints and opportunities associated with the Site.

2.26 The technical studies have been undertaken in accordance with current best practice. Specific guidance used is referenced within each of the respective assessment chapters. The majority of assessments involved consultations with statutory and non-statutory bodies, desk-based research, site inspections and surveys, impact prediction and mitigation.

2.27 The assessment and conclusions of the ES are based on the description of the Development provided in Chapters 3 and accompanying figures. Chapter 5 sets out details of the demolition and construction phase of the Development, on which the ES is based.

Structure of Technical Chapters

2.28 Each technical chapter of the ES (Chapters 6-13) has been set out broadly in line with Table 2.1 below.

Table 2.1: Structure of the Technical Chapters

Heading	Content
Introduction	Each of the technical chapters begins with an introduction providing context to the EIA completed.
Policy Context	This section includes a summary of policies of relevance to the environmental discipline and explains its purpose in the context of the Development and the ES.
Assessment Methodology	This section describes the method and approach employed in the assessment of likely significant effects, the criteria against which the significance has been evaluated, the sources of information used and any technical difficulties encountered. Relevant legislation is also identified.
Baseline Conditions	This section describes and evaluates the baseline environmental conditions i.e. the current situation and anticipated changes over time assuming the Site remains undeveloped (future baseline).
Likely Significant Effects	This section identifies the likely significant effects on the environment resulting from the Development during the demolition and construction and operational phases. A description of the likely significant effects of the Development and an assessment of their predicted significance is provided.
Mitigation Measures	This section describes the measures which would be implemented to mitigate against potential adverse impacts. Where possible, enhancement measures have also been proposed.
Residual Effects	The residual effects, i.e. the remaining effects of the Development assuming implementation of the proposed mitigation measures, have been estimated and presented.
Cumulative Effects	This section considers the cumulative effects of the Development with committed developments identified within the vicinity of the Site. Any likely significant effects on the environment arising in this respect are set out in this section.
Summary	Each technical chapter concludes with a brief summary outlining the potential residual effects for the demolition and construction phase (short/medium) and operation (medium/long-term) phase of the Development.

Likely Significant Effects

2.29 The assessment of impact significance has been undertaken using appropriate national and

international quality standards. Where no such standards exist, the judgments that underpin the attribution of significance are described. The guidelines, methods and techniques used in the process of determining significance of effects are contained within each of the technical chapters presented.

Magnitude

2.30 The methodology for determining the scale, or magnitude, of effect is set out in Table 2.2 below.

Table 2.2: Methodology for Assessing Magnitude

Magnitude of Impact	Criteria for Assessing Effect
Major	Total loss or major/substantial alteration to key elements/features of the baseline conditions such that the post development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition/attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss/alteration will be discernible/detectable but not material. The underlying character / composition / attributes of the baseline condition will be similar to the pre-development circumstances/situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

Sensitivity

2.31 The sensitivity of a receptor is based on the relative importance of the receptor using the scale in Table 2.3 below.

Table 2.3: Methodology for Assessing Sensitivity

Sensitivity	Examples of Receptor
High	The receptor/resource has little ability to absorb change without fundamentally altering its present character, or is of international or national importance.
Moderate	The receptor/resource has moderate capacity to absorb change without significantly altering its present character, or is of high importance.
Low	The receptor/resource is tolerant of change without detriment to its character, is of low or local importance.

Significance

2.32 The significance of an environmental effect is determined by the interaction of magnitude and sensitivity, whereby the impacts can be beneficial or adverse. Table 2.4 below shows how magnitude and sensitivity interact to derive effect significance.

Table 2.4: Methodology for Assessing Significance

Magnitude	Sensitivity		
	High	Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
Moderate	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
Negligible	Negligible	Negligible	Negligible

2.33 The above magnitude and significance criteria have been provided as a guide for technical specialists to assess impact significance. Where discipline specific methodology has been applied that differs from the generic criteria above, this has been clearly explained within the given chapter under the heading of Assessment Methodology.

Mitigation

2.34 Any adverse environmental effects have been considered for mitigation at the design stage and, where practicable, specific measures have been put forward. Measures have been considered based on the following hierarchy of mitigation:

- Avoidance;
- Reduction;
- Compensation;
- Remediation; and
- Enhancement.

2.35 Where the effectiveness of the mitigation proposed has been considered uncertain, or where it depends upon assumptions of operating procedures, data and/or professional judgement has been introduced to support these assumptions.

2.36 Mitigation recommended during the demolition and construction phase would be set out in the CEMP to be agreed with LBW prior to the commencement of work and implemented throughout the duration of the works. Outline mitigation measures to be included in a future CEMP are set out in Chapter 5 Construction Methodology and Phasing.

2.37 Mitigation to be implemented during the operational phase would be secured through planning conditions and obligations.

Residual Effects

2.38 The likely significant effects on the environment, assuming the successful implementation of mitigation measures proposed, have been identified within each chapter.

Cumulative Effects

2.39 The ES considers the potential for likely significant cumulative effects on the environment. The assessment has been informed by Planning Practice Guidance[1], specifically the section: *'When should cumulative effects be assessed?'* which states:

> *"Each application (or request for a screening opinion) should be considered on its own merits. There are occasions, however, when other existing or approved development may be relevant in determining whether significant effects are likely as a consequence of a proposed development. The local planning authorities should always have regard to the possible cumulative effects arising from any existing or approved development."*

2.40 The ES duly considers the potential for likely significant effects on the environment resulting from *'existing and approved'* developments in the area coming forward at the same time as the Development.

2.41 One scheme has been identified that could have the potential to lead to likely significant cumulative effects on the environment. Table 2.5 provides details and the location of the scheme is shown on Figure 2.1. The scheme has been agreed for assessment with LBW through the Scoping process.

Table 2.5: Cumulative Schemes

Scheme Name and Application Number	Scheme Details	Planning Status	Approximate Distance from the Site
Digby Stuart and Southlands Colleges Roehampton Lane SW15 (Ref: 2014/3330)	Construction of a part 4, part 5 storey building to provide student accommodation, conference suite, academic and support space; construction of a part 4, part 5 storey library building to the west of Digby Stuart lawns; associated landscaping and tree works, closure of existing main vehicular access onto Roehampton Lane, alterations to existing southern pedestrian and vehicular access including boundary	Application Approved (October 2014)	300m north of the Site.

[1] Paragraph: 024 Reference ID: 4-024-20170728, Revision date: 28/07/2017

Scheme Name and Application Number	Scheme Details	Planning Status	Approximate Distance from the Site
	walls; formation of new pedestrian and vehicular access onto Roehampton Lane; relocation of car parking; alterations and extension to internal road layout and new pedestrian footpath.		

2.42 Each technical chapter (Chapters 6-13) has assessed the potential for likely significant effects on the environment as a result of the cumulative effect with the above committed development.

Assumptions and Limitations

2.43 The principal assumptions that have been made and any limitations that have been identified in preparing the ES are set out in each technical chapter. General assumptions include the following:

- Assessments assume the baseline conditions at the time of ES preparation (2018/2019) unless otherwise stated in the technical chapter;
- It is assumed that current surrounding land uses do not change, with the exception of the committed development identified;
- Assessments are based on published sources of information and primary data collection. Sources are provided as necessary;
- Assessments are based on the description of development set out in Chapter 3 and the anticipated construction methodology and programme described in Chapter 5;

Objectivity

2.44 The technical studies undertaken within the ES have been progressed in a transparent, impartial and unbiased way with equal weight attached, as appropriate, to beneficial and adverse effects. Where possible, this has been based upon quantitative and accepted criteria together with the use of value judgments and expert interpretations.

2.45 The assessment has been explicit in recognising areas of limitation within the ES and any difficulties that have been encountered, including assumptions upon which the assessments are based. Where appropriate, the assessment of significance has been given confidence levels to give a judgement to the likelihood of an effect occurring.

References

[i] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (2018 No.695)

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 3 Site and Development Description

BARTON WILLMORE

3 SITE AND DEVELOPMENT DESCRIPTION

Site Context

3.1 The Alton Estate is located on the western edge of the London Borough of Wandsworth (LBW), to the east and north east of Richmond Park (refer to Figure 1.2). The estate was constructed by the London County Council in the 1950s in response to the urgent need for housing in London after World War II. The principle access into the estate is via Roehampton Lane, which connects Roehampton with the A3 trunk to the south and the South Circular Road to the north.

3.2 The Alton Estate is formed of two distinct estate areas, namely Alton East and Alton West, the latter being the focus of the re-development. Alton West was a larger development opportunity than Alton East and thus lent itself to a more monumental scale that was built mainly between 1954 and 1959.

3.3 Parts of the Site are located within the Alton Conservation Area. This was designated in 2001 to protect the historic and architectural setting of the Alton area. The estate is also an Archaeological Priority Area.

3.4 There are a number of designated heritage assets located in close proximity to the Site. These include the Grade I Listed Roehampton House, Mount Clare House and Parkstead House, the Grade II* Listed Downshire House and the Temple within its former grounds, Dunbridge, Denmead, Charcot, Winchfield and Binley Houses and the Bull at the foot of Downshire Field and the Grade II Listed Nos 1-13, 15-33, 2-26 Minstead Gardens and Nos 245-255, 257-61 (odd) Danebury Avenue and retaining walls.

3.5 The Site is adjacent to Richmond Park, a Grade I Registered Park and Garden, and Grove House Registered Park and Garden (listed Grade II*) is also adjacent to the Site on the north side of Clarence Lane.

3.6 The Site is not subject to any ecology or landscape designations. There are two European designated sites within 2km of the Site. Richmond Park Special Area of Conservation (SAC), Site of Special Scientific Interest (SSSI), and National Nature Reserve (NNR) is adjacent to the south west of the Site and Wimbledon Common SAC and SSSI is located approximately 750m to the east of the Site. Barnes Common Local Nature Reserve (LNR) is situated approximately 1.7km to the north of the Site.

3.7 LBW has declared the entire borough as an Air Quality Management Area (AQMA), for exceedances of the annual mean nitrogen dioxide (NO_2) and daily mean particulate matter (PM_{10}) objectives.

3.8 According to the www.gov.uk/check-flood-risk website, the Site is located in Flood Zone 1 (at a low risk of flooding). The Site is not located within a Source Protection Zone (SPZ).

Site Description

3.9 The Site covers a total area of approximately 12.5 hectares (ha) and is shown on Figure 3.1.

3.10 There are 288 existing dwellings within the existing Site comprising a mix of houses and flats, and which are predominately constructed from brick and concrete and typically vary between 2 and 4 storeys in height. Allbrook House, which comprises flats, is the tallest structure at 8 storeys. These buildings and are proposed to be demolished and replaced through the Development. The existing dwellings are made up of 158 existing Council tenanted (social rent) homes and 130 leasehold and freehold (private) properties.

3.11 There are a range of retail services on the Site, including individual shops, cafes, betting shops, professional services (opticians), a laundrette, fast food takeaways, plus a satellite housing office for LBW and the MET Police. There are also various community facilities on the Site, including a library, nursery school, youth services, elderly residents club room and doctor surgeries. Roehampton Village is located to the north-east of the Site on the opposite side of Roehampton Lane. Roehampton High Street contains a range of small-scale local retailers and services.

3.12 Downshire Field is a large area of open space located towards the western side of the Site. An existing children's play area is situated within Downshire Field with other play facilities at the Alton Activity Centre and Hersham Close.

3.13 The main vehicular access to the Alton West Estate is via the junction between Danebury Avenue and Roehampton Lane. Other secondary access points are located at Kingsclere Close and from Alton East via Holybourne Avenue.

Description of Development

3.14 The application is for a part outline and part detailed planning permission (hybrid planning application) comprising the following:

a) Phased demolition of all existing buildings and structures (except Alton Activity Centre community building);

b) Mixed-use phased development ranging from 1-9 storeys above ground level comprising up to 1,103 residential units and up to 9,572 sqm (GIA) of non-residential uses comprising new and replacement community facilities (including enhanced library and healthcare facilities, youth facilities, community hall, children's nursery & children's centre) (Class D1); flexible commercial floorspace (comprising retail (Class A1), financial and professional services (Class A2), café / restaurants (Class A3), hot-food takeaways (Class A5), business (Class B1), and community uses (Class D1)); landscaping; removal and replacement of trees; public realm improvements; access improvements; relocation of bus turnaround area; improvements to children's play facilities; provision of energy centre; car & cycle parking; and other highway works incidental to the development. All matters reserved except for Blocks A, K, M, N, O, Q, Portswood Place Nursery and Community Centre and highway/landscape/public realm improvements.

3.15 The Development will comprise a mix of uses including residential, commercial and community uses across a number of Blocks.

3.16 Blocks A, K, M, N, O, Q, the Portswood Place Community Centre and landscape proposals to the village square, Alton Activity Centre and Downshire Field, comprise the detailed element of the application and Blocks B, C, D, E, F, G, H, I & J comprise the outline element of the application (refer to Figure 3.1).

3.17 The outline element of the Development is defined by a set of parameters that place limits on the quantum, extent and type of development that could come forward under future detailed planning proposals. The parameters include the following (as included in Appendix 3.2):

- Development Plots;
- Access and Circulation;
- Maximum Plot Heights;
- Ground floor frontage; and
- Public Realm.

3.18 Each technical chapter within the ES assesses the detailed drawings (Appendix 3.1) and the parameter plans (Appendix 3.2) and, specifically, the potential development within the parameters that would lead to the "worst case" effects for that discipline. This will

ensure that any future detailed proposals coming forward within the parameters of a future outline consent would not lead to greater (more adverse) effects on the environment than have been assessed at the outline stage.

3.19 Figure 3.2, the Masterplan, has been prepared to illustrate one way in which the Development could be delivered.

Residential

3.20 The Development includes the delivery of 1,103 new homes across the Site. 654 residential units will be provided as part of the detailed element of the Development and up to 449 residential units will be provided as part of the outline element of the Development.

3.21 Dwellings will be provided in a range of tenures, including social rent, Intermediate (including shared equity and shared ownership) and private market housing, as shown in Table 3.1 below. This is further detailed in Table 3.2, which provides the housing mix for the detailed element of the Development whilst Table 3.3 includes an indicative total housing mix for the outline element of the Development.

Table 3.1: Proposed Housing Mix

Residential Unit Size	Social Rent	Intermediate	Private	Total
Total	**188**	**68**	**847**	**1,103**

Table 3.2: Proposed Housing Mix – detail

Residential Unit Size	Social Rent	Intermediate	Private	Total
1 Bed 1 Person	0	0	2	2
1 Bed 2 Person	18	1	142	161
1 Bed 2 Person (w/c)	0	0	0	0
2 Bed 3 Person	0	0	316	316
2 Bed 3 Person (w/c)	0	0	12	12
2 Bed 4 Person	30	6	1	37
2 Bed 4 Person (w/c)	3	0	13	16
3 Bed 5 Person	31	38	8	77
3 Bed 5 Person (w/c)	2	0	4	6
3 Bed 6 Person (w/c)	2	0	0	2
4 Bed 5 Person	13	0	0	13
4 Bed 6 Person	10	0	0	10
4 Bed 7 Person	1	0	0	1
4 Bed 8 Person (w/c)	1	0	0	1
Total	**111**	**45**	**498**	**654**

Table 3.3: Proposed Indicative Housing Mix – outline

Residential Unit Size	Social Rent	Intermediate	Private	Total
Total	**77**	**23**	**349**	**449**

3.22 In total, 256 affordable homes will be delivered as part of the Development. Of these 256 affordable homes, 188 will be provided as social rented homes and 68 will be provided as intermediate tenure homes. A total of 156 affordable homes, including 111 social rented homes and 45 intermediate units will be delivered as part of the detailed element of the Development while up to 100 affordable homes, including up to 77 social rented homes and up to 23 intermediate units will be delivered as part of the outline element of the Development.

Mixed-Use

3.23 The Development includes a range of new and replacement mixed-use facilities, including commercial and community use. A total of 9,572sqm GIA of mixed-use floor space will be provided as part of the Development, which will include 3,402sqm GIA of flexible commercial floorspace (Use Class A1-A3, A5, B1 and D1), 643sqm GIA of dedicated office floorspace (Use Class B1) and 5,527sqm GIA of dedicated community floorspace (Use Class D1). All proposed office and community floorspace will be provided as part of the detailed element of the Development. Of the proposed flexible commercial floorspace, 1,809sqm GIA will be provided within the detailed element and up to 1,593sqm GIA will be provided within the outline element of the Development.

3.24 The 1,809sqm of flexible commercial floorspace proposed within the detailed element of the Development will be predominantly located within the groundfloor areas of Blocks N and O. 85sqm of flexible commercial floorspace will also be provided within Minstead Gardens in the form of a new retail unit. The groundfloor levels of Blocks B and C within the outline element of the Development will include up to 1,593 sqm (GIA) of flexible commercial use (Refer to Appendices 3.1 and 3.2).

3.25 The proposed office space will be located within Block O of the Development. A proportion of the space will be used by LBW's Housing Office Team to provide a 'community service'. The remainder of the space would be set aside as being flexible workspace available for the local community and voluntary sector.

3.26 A range of new and replacement community facilities will also be included as part of the Development. Of the 5,527sqm GIA of proposed community floorspace, 2,987sqm GIA will be provided within Block A to the east of the Development, while 1,940sqm GIA will be

provided at Portswood Place and 600sqm GIA will be provided at Minstead Gardens, located to the west of the Development (refer to Appendix 3.1). Table 3.4 provides a breakdown of the proposed community floorspace within the Development.

Table 3.4: Proposed Community Facilities

Area	Facility	Floorspace (sqm GIA)
Block A (Detail)	Library	1,214
	Health Facilities	652
	Base Youth Centre	321
	Community Hall	227
	Ancillary Community Floorspace	573
Portswood Place (Detail)	Eastwood Nursery and Eastwood Children's Centre	1,940
Minstead Gardens (Detail)	Danebury health facilities	477
	Minstead Gardens Club Room	123
Total		**5,527**

Building Heights and Massing

3.27 The majority of the building heights across the Development will vary from 4 to 9 storeys in height. The maximum height of the buildings within the detailed element of the Development will be 9 storeys (64.20m AOD) in height for Block Q and the maximum height of buildings within the outline element of the Development will be 8 storeys (57.02m AOD) in height for Block B (refer to Appendices 3.1 and 3.2).

Green Infrastructure

3.28 The proposed green infrastructure for the Development is shown on the illustrative landscape masterplan provided at Figure 3.3.

3.29 Up to a total of 87,692 sqm of open space areas would be provided within the Development, and would include publicly accessible and communal amenity space.

3.30 The Development will include the creation of a new village square located at the meeting between Alton East, Alton West and Roehampton Village, to provide a central hub for Roehampton. The new village square will include a combination of hard and soft landscaping and will include a play space and seating areas.

3.31 Open space areas to the west of the Development will include the existing Downshire Field. Landscape improvements and selective tree removals are proposed that will result in poorer quality specimens being removed from Downshire Field however a programme of new tree planting proposed to enhance the landscape setting and ecological value of

the Site. A range of landscape design features will also be included within Downshire Field, including:

- New pedestrian footpaths, exercise equipment, a trim trail, and incidental play features, such as natural boulders to provide places for climbing;
- Enhancements and enlargement to the existing Downshire Field play space to create a natural play environment suitable for children of all ages;
- Quiet seating areas for residents of the wider estate;
- Flower-rich grassland areas; and
- Biodiversity enhancements, including loggeries and bat boxes.

3.32 A mixture of children's play spaces is proposed across the Development. This will a local play facility, suitable for 5-11 year olds, comprising sensory and sculptural play features for climbing and balancing will be provided within the Village Square to the east of the Development. Two enhanced play hubs with a variety of equipment and features suitable for children of all ages will also be created at the Alton Activity Centre (redesigned to provide open access to a multi-use games area and updated play structure), and within Downshire Field, where the existing play park will be replaced and enlarged with naturalistic local play features, such as timber climbing and balancing equipment and natural landforms with integrated play elements. Dedicated play areas for younger children (0-4 year olds) will be set aside within the play hubs. Within the communal courtyards located within the residential blocks, doorstop play facilities suitable for young children (0-4 years old) will also be provided.

3.33 Further details of green infrastructure improvements are provided within the Design, Landscape and Access Statement submitted as part of the planning application.

Access

3.34 The main vehicular access points into the Development will be via Roehampton Lane to the east of the Site and Danebury Avenue the west of the Site.

3.35 The Development will include a number of access improvements. The junction of Danebury Avenue with Roehampton Lane is proposed to be enhanced with changes in surfacing to both footways. The alignment of the carriageway on Danebury Avenue where it joins Roehampton Lane is proposed to be revised to provide:

- Improved pedestrian crossing facilities via a median strip;
- Improved cycle facilities via a mandatory cycle lane on the approach to the

advanced cycle stop line; and

- Improved vehicle access for buses through the introduction of a second exit lane separating left and right turning traffic.

3.36 The junction of Kingsclere Close with Roehampton Lane is proposed to be retained with the Kingsclere Close approach improved by introducing offline bays to remove parking from the carriageway. Access to 166-168 Roehampton Lane to the east of the Site will be improved through simplifying the current arrangement by widening the egress point to provide a single two-way access. This will reduce conflict and reduce the risk of access becoming blocked and affecting Roehampton Lane. The existing bus turnaround at the Minstead Gardens junction with Danebury Avenue is also proposed to be relocated to the west to the Tunworth Crescent junction with Danebury Avenue.

3.37 Further details of the access improvements to be provided as part of the Development are included in ES Volume 3: Transport Assessment.

Parking

3.38 Up to 544 residential car parking spaces will be provided across the Development, either on-street or in concealed podium car parks within the residential blocks.

3.39 An additional 7 parking bays will be provided within Block A of the detailed scheme, to provide operational facilities for the community uses in the block.

3.40 A minimum provision of 3 accessible car parking spaces per 10 accessible dwellings will be marked as accessible spaces with at least one wheelchair accessible space per core restricted for use by blue badge holders.

3.41 20% of car parking spaces will have Electric Vehicle Charging Points (EVCPs) installed (active provision), with a further 20% having the potential for installation of EVCPs in the future (passive provision).

3.42 Up to a total of 2,100 residential cycle parking spaces will be provided within the Development, comprising up to 2,072 long stay and 28 short stay spaces. Up to an additional 139 non-residential cycle parking spaces will also be provided as part of the Development, comprising up to 28 long stay and 111 short stay spaces.

Lighting

3.43 The lighting scheme for the Development will be designed taking into account the Institute of Lighting Professionals (ILP) (2001) Guidance Notes for the Reduction of Obtrusive Light[i] and BS 5489-1:2013[ii] and BS EN 13201-2:2015[iii]. The design of the street lighting will promote safe and secure movement for all users by including street lighting, integrated road safety features and natural surveillance of routes to create safe and accessible neighbourhoods. Further detail is provided within the Design, Landscape and Access Statement submitted in support of the planning application.

Waste Management

3.44 The Development will provide appropriate opportunities for the efficient collection and recycling of waste and adequate space for refuse and recycling facilities will be provided within the built areas of the Development. Further details are provided in the Waste Strategy provided as part of the planning application.

Energy, Sustainability and Climate Change

3.45 As part of the Development, a Travel Plan will be adopted to encourage the use of sustainable transport choices (to be secured via planning condition). This will include measures to encourage a shift of mode to walking, cycling and use of public transport and a move away from reliance on private cars. Further details are provided in the Transport Assessment which is included at Volume 3 of the ES.

3.46 The drainage strategy for the Development will incorporate Sustainable Drainage Solutions (SUDS) to ensure the sustainable management of surface water on the Site. The drainage strategy allows for changes in anticipated rainfall as a result of climate change. Further detail is provided within the Flood Risk Assessment and Drainage Strategy submitted as part of the planning application.

3.47 An Energy Strategy has been prepared for the Development to demonstrate how it complies with LBW policies, the adopted London Plan and supporting GLA technical guidance on energy. Given that the draft London Plan 2017 is a material planning consideration, albeit has limited weight, the strategy has also considered it.

3.48 The Energy Strategy describes demand-reduction measures, energy-efficiency measures and renewable energy to demonstrate how the Development meets the objectives of the

energy hierarchy: Be Lean, Be Clean, Be Green. The table below summarises the strategy for each of these objectives.

Table 3.5: Summary Energy Strategy

Be Lean	The Development achieves a high quality, sustainable design by integrating the following passive and active design measures to reduce energy demand: • Energy-efficient building fabric and insulation to all heat loss floors, walls and roofs; • High-efficiency double-glazed windows throughout; • Quality of build will be confirmed by achieving good air-tightness results throughout; • Efficient-building services including high-efficiency heating and ventilation systems; • Low-energy lighting throughout the buildings; and • All design measures will contribute to an enhancement in energy performance equal to a 4.29% reduction in regulated CO_2 emissions over the Building Regulations (2013) baseline.
Be Clean	• A site-wide heat network, powered by gas-fired, low-NOx CHP and high-efficiency back-up boilers will serve domestic and non-domestic units across the development. A CHP-led system will be implemented as a means of delivering a strategically-significant scheme for Wandsworth and is adopted within the Development as an important transition technology. The design for the energy centre accommodates a CHP-led heating solution and made provision for connection to an area-wide District Heat Network (DHN) beyond the development boundary through future-proofing measures; • The DHN will meet GLA's air quality limits. In order to meet and maintain the NOx limits, prior to occupation the Low-NOx CHP unit and boiler emissions will be tested. These will continue to be monitored by the Energy Service Company so that air quality limits are maintained; and • Through the design of an efficient, decentralised heat network, the regulated CO_2 emissions will be reduced by a further 29.68% over Building Regulations (2013) baseline.
Be Green	• Air Source Heat Pumps; • Solar PV will be the preferred strategy for renewables used within the Development; • Air Source Heat Pumps form a part of the heating strategy and will provide heating and cooling to the retail units in the Development; and • In combination, Solar PV and Air Source Heat Pumps will deliver a further 3.36% reduction in regulated CO2 emissions over Building Regulations (2013) baseline.

3.49 Detailed calculations of carbon saving for residential and non-residential energy use are set out in the Energy Strategy. It also sets out the carbon offsetting calculation demonstrating what the Applicant commits to paying to address the shortfall in on-site carbon savings. In summary, the Development would meet the LBW and adopted London Plan policies.

3.50 The Development will also include the following key sustainability features, as set out in the Sustainability Statement:

- A minimum of BREEAM 'Excellent' will be achieved for all non-residential elements of the Development;
- All dwellings included in the Development will be designed to meet a water consumption rate of 105 litres per person per day;
- Construction materials will be responsibly sourced, durable, robust and healthy. The Applicant will implement their Sustainable Procurement Policy which states a preference for using materials with a low environmental impact, as well as seeking to use locally-sourced, recycled and reclaimed materials where available;
- The Considerate Constructors Scheme will be implemented by the Applicant to manage the construction process in an environmentally, socially-responsible and accountable manner;
- The Development already benefits from existing public transport routes and will increase provision for sustainable transport by creating connections through the site for pedestrians and cyclists; and
- Artificial, external lighting will be energy efficient. Artificial lights will be positioned in the most suitable locations across the Development and public realm, carefully tailored to the use it supports.

3.51 The Energy, Overheating and Sustainability Strategies are included as Appendices 3.3 to 3.5 of this chapter.

References

[i] Institute of Lighting Professionals (2011) Guidance Notes for the Reduction of Obtrusive Light GN01:2011.
[ii] BSI (2013) BS 5489-1:2013: Code of practice for the design of road lighting. Lighting of roads and public amenity areas
[iii] BSI (2015) BS EN 13201-2:2015 Road lighting. Performance requirements

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Chapter 4 Alternatives and Design Evolution

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4.0 ALTERNATIVES & DESIGN EVOLUTION

Introduction

4.1 Regulation 18 and Schedule 4 of the EIA Regulations require an applicant to provide "…a *description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment*". This chapter, therefore, reviews the principal land use and siting options explored and the reasoning for the selection of the current design for the Development which forms the subject of assessment within the ES. The following three alternative options were considered:

- The 'do nothing' alternative where the Development is not progressed;
- Alternative locations or uses; and
- Alternative design/layout for the Development.

4.2 The form of the Development has been influenced by a range of factors, including location, surrounding uses and landscape character, environmental impact assessment and input from LBW, statutory consultees and stakeholders through extensive meetings and workshops.

The 'do nothing' Alternative

4.3 The Site is within the Applicant's control and development can be delivered on this Site. Should the Development not proceed, the beneficial and adverse effects outlined in this ES relating to the Development would not occur.

Consideration of Alternative Locations and Uses

4.4 LBW have been working with the local community to develop proposals to regenerate the Alton Estate for a number of years.

4.5 A number of options suggesting how the Alton West area could change and develop were produced and consulted on for six weeks during September and October 2013. These identified four key areas of change on which three options were presented, each including an increasing level of intervention. These areas of change were the Danebury Avenue centre, the Portswood Place centre, the housing area along Danebury & Harbridge Avenue, and the central park area between Downshire House and Mount Clare including Bull Green.

4.6 The Options consultation enabled feedback to be provided which helped determine the level of change the community wanted to see in each area, as well as feedback on specific ideas and proposals.

4.7 Following the options consultation in relation to the alternative locations, between September and October 2013, a preferred option was developed. The preferred option included a series of proposals that reflected the scale of change supported during the options stage, and a series of specific proposals which received support. These included:

a) A revitalised town centre which included an improved village green, environmental improvements, better and more varied shops, a new community cultural facility, and new buildings for a range of community service providers;
b) A revitalised park centre at Portswood Place including a new community hub for family, health, wellbeing and community facilities, and the potential for a relocated Recreation Centre from the town centre. A relocated bus stand and environmental improvements to streets and spaces. The potential for a new role for Mount Clare, which could include residential uses including specialist housing for older people;
c) New housing and apartment blocks along Danebury Avenue, Harbridge Avenue, and Kingsclere Close, providing higher quality homes with better layouts within the existing street pattern. New housing was also proposed to replace the buildings at 166 & 168 Roehampton Lane, with services from here moving to Portswood Place;
d) Improvements to open spaces and the public realm including an improved Central Park at Bull Green, to include a redesigned children's playground, a woodland play area, an amphitheatre and stage, an events field and a café in the park, and a 'necklace' path around the edge of the park for pedestrians and cyclists; and
e) Improvements relating to transport and movement were also suggested including an extension of the K3 route through the Alton Estate to Barnes from Kingston via the Alton. Further consideration was also given to the controlled opening of the Danebury avenue barrier outside peak times.

4.8 The preferred options stage took into consideration the results of the consultation, and feedback from other stakeholders, LBW Council officers, and elected members. It was also informed by discussions with statutory stakeholders such as English Heritage, the GLA, TfL, and neighbouring authorities such as Royal Parks and the London Borough of Richmond (LBR).

4.9 Key stakeholder feedback from the options and preferred option consultation included:

- GLA – advised during the options stage that greater sensitivity to the heritage assets on the Alton Estate, especially the listed bungalows, should be demonstrated in the final masterplan;

- English Heritage – raised concerns during the preferred option stage in relation to the proposed demolition of the grade II listed Minstead bungalows as well as the size of the proposed Health and Wellbeing Centre, and the possibility that it will obscure views of Mount Clare;
- 20th Century Society - favoured a refurbishment approach to development rather than redevelopment in the Danebury and Harbridge areas. However, proposals regarding the parkland, upgrading of public realm, development at Portswood Place with retention of bungalows were supported.

4.10 Taking the feedback into consideration, the preferred option design was amended for the Final Masterplan, included the retention of the Minstead Garden bungalows.

4.11 Further details of the options process and associated consultation is provided in the Statement of Community Involvement submitted in support of the planning application. The public consultation undertaken as part of the application has also been set out in ES Chapter 2: ES Methodology.

4.12 The Alton Area Masterplan Report was subsequently approved in October 2014[i] to establish the vision for the regeneration of the Alton Estate. The Masterplan's proposals were subsequently formalised in the Roehampton Supplementary Planning Document (SPD)ii which was adopted in October 2015. The SPD transposed the objectives of the Alton Area Masterplan into planning policy guidance, to help inform future development proposals.

4.13 The Site falls within the Area Spatial Strategy for Roehampton, as defined within LBW's Site Specific Allocations Document[iii] under Site Allocation 8.1 – "Area Spatial Strategy for Roehampton". The allocation explains that the area is identified for comprehensive regeneration and new development, in accordance with LBW Core Strategy Policy PL15 (Roehampton)[iv]. Within the Site there are also the two following site-specific allocations that have been identified:

- Site allocation 86: Roehampton, Danebury Avenue; and
- Site allocation 86D: 166-170 Roehampton Lane, SW15.

4.14 The Roehampton SPD was subject to extensive community consultation and a Sustainability Appraisal (SA)[v]. The Site has therefore been through the SA process and is determined to be a suitable location for development.

4.15 Accordingly, no alternative locations and types of land uses were considered during the design evolution of the Development.

Consideration of Alternative Designs

4.16 The Development submitted for approval is the result of a thorough analysis of environmental constraints and opportunities, access issues and market demand. Consultation with LBW, statutory consultees, the local community and other local stakeholders has been a key influence in design evolution.

4.17 The design of the Development has been guided by a number of key 'Visions' for the Masterplan area of Alton Estate, as set out in the Roehampton SPD. These include:

- The area will be transformed into a place of housing choice for a wider variety of households, ranging from Council tenants who regard it as among the best location sin the borough, to owner-occupiers who see it as competing in the wider south-west London markets;
- A new generation of high-quality homes will be delivered with existing sub-standard homes replaced and new homes added. Residential buildings will be of high quality and attractive design, well connected to the existing street layout, and built to contemporary standards to meet the needs of a wide range of residents;
- New and enhanced shops, community services and business spaces will revitalise the Local Centre. An improved community arts and cultural offer will serve the SPD area residents and wider Roehampton neighbours. Start-up business space will create new and continuing employment opportunities for local residents. Extending primary health care services, exercise space, spaces for independent non-profit community organisations, workshops and enterprise space and local retail services will also be delivered, a with a focus on the well-being of the local community;
- Existing green and open spaces will be refreshed and reinvigorated with a significant renovation of the landscape, and provision made for a range of new outdoor activities and new access for residents. A network of new and improved streets, cycle paths and footpaths will connect the SPD area to its neighbours and surroundings; and
- The area will become a safe, attractive, high-quality and mixed neighbourhood. The layout and design of development will draw on the positive aspects of the historic landscape and LCC Masterplan, enhancing and better revealing heritage assets and the special qualities of the area.

4.18 The Applicant has added to this vision for the regeneration of the Alton Estate by setting the following additional vision objectives:

- To blend this iconic post-war estate with the placemaking and streetscape lessons that have been learnt since its formation to create a great place to live;

- By using contemporary architecture, inspired by its heritage context and remnants of the former Capability Brown parkland landscape from which the estate was formed, the vision for the masterplan is to deliver a new generation of high-quality homes in strikingly designed buildings, combined with exemplar civic and commercial buildings and useable and attractive public realm; and
- Through carefully targeted interventions into the existing estate the regeneration seeks to create a place that evolves and builds upon the palimpsest of development has occurred on the estate over the years. Through the restoration of links to its historic past and sympathetic architecture that informed by the existing heritage context, the masterplan offers an opportunity to reconnect and bring together the currently fragmented areas of Roehampton Village and the Alton East and West Estates.

4.19 The vision for the Development builds upon the masterplanning work commissioned by the LBW as part of the Alton Area Masterplan which was subsequently transposed into planning guidance in the form of the Roehampton SPD.

4.20 To inform the Development, the following design principles were identified at the outset and have followed through the design process:

- **Permeability**: The masterplan should maintain important views across the site as well as creating new ones to increase the sense of openness. Connections between the estate and surrounding areas such as Roehampton Village and Alton East should be strengthened with new routes created at strategic points;
- **High quality public realm**: The public realm should be flexible with simple, multi-functional spaces. These spaces should be visible and approachable for all;
- **Massing**: The proposed townscape should complement the local character areas of Roehampton Village, Alton East and Alton West whilst including suitable variation within its own architecture to create a unique, identifiable character;
- **Materiality**: Materials should be used to transition between the traditional architectural language of Roehampton Village and the Modern language of Alton West. Materials should also be used to present quality and variety across the masterplan;
- **Active frontage**: The streets at the core of the masterplan should be vibrant and energised by strong and continuous active frontage;
- **Declutter streetscapes**: The masterplan should be welcoming and safe for pedestrians and cyclists, parking should therefore be primarily situated within or below podiums in proposed buildings to keep it out of site as much as possible;
- **Landmarks**: The selection of existing local landmarks should be highlighted by the masterplan and their setting enhanced to celebrate them. New landmarks should be created to generate a strong sense of place and help people find their way through the

site;

- **Architectural Variety**: The masterplan should contain an exciting and varied set of block types with elements of joy and surprise within the architecture;
- **Road Retention**: The existing road layout should be retained with improvements where necessary to limit disruption to existing utilities, allow greater ease of phasing and make the most efficient use of space;
- **Clear open space ownership**: Residents should feel a great sense of pride and ownership of their space and this should be benefitted by generous and beautiful amenity space that feels private, secluded and secure;
- **Solar Orientation**: The shared amenity spaces within the masterplan should have maximum exposure to sunlight and face south as often as possible; and
- **Mix of uses**: The masterplan should have a clear centre with accessible and welcoming civic spaces, exciting mix or retail spaces and a mixture of offices. The Village square should act as the cultural hub of all of these uses to tie the masterplan together.

Design Evolution

4.21 A number of changes have occurred over the course of the design evolution and Design Review Panel meetings, in relation to key constraints and opportunities on and surrounding the Site. These are summarised below.

Wind

4.22 Through the use of wind analysis (Computational Fluid Dynamics (CFD) simulations) it was determined that the Site has wind conditions which are suitable for the intended use, with the exception of localised areas around the base of the medium-rise towers located to the west of the Site.

4.23 Appropriate landscaping was subsequently designed within the Development, in order to reduce wind speeds in windier areas/eliminate strong wind exceedances, and to ensure that the Site is suitable for its intended use. All ground level amenity spaces, including the Village Square to the north of Block A and the Alton Activity Centre to the west of Block K are expected to have the desired wind conditions. Additionally, all podium amenity spaces are expected to have the desired wind conditions during the summer season.

Ecology

4.24 A number of opportunities have been taken during the evolution of the design of the Development, to encourage and enhance the site wide biodiversity and ecology, including through:

- The provision of a network of trees and green spaces to form potential wildlife habitats and green corridors;
- Promotion of sustainable planting by developing planting designs that are appropriate for their location, including the availability of sunlight and water;
- Incorporation of native plant species into the planting designs across the Development including the use of native shrub planting to provide nesting opportunities for birds; and
- Establishment of a series of living roofs on the buildings across the site, to aid biodiversity and establish a range of habitats.

Noise

4.25 A study has been undertaken as part of the planning application to inform the need for appropriate design measures in relation to noise.

4.26 Following studies of the existing background noise levels at sensitive receptor locations, it was determined that fixed plant within the Development should be designed appropriately and should not exceed a noise level of 41 dB(A) (assuming daytime use only) to adhere to the noise requirements of LBW.

4.27 Furthermore, in order to achieve the level of noise attenuation necessary for indoor residential areas of Blocks M and O, high specification glazing products have been advised with a sound reduction index no less than 39 dB as a worse-case.

4.28 Other noise design measures include the closure of windows (although not sealed) to achieve the required level of mitigation and alternative means of ventilation (potentially in the form of trickle vents or mechanical ventilation) to achieve appropriate sound reduction rating levels.

4.29 Recommendations have been made for the building envelope of the proposed Eastwood Children's Centre and Nursery and the northern facade of the proposed library building to be designed to reduce external to internal noise levels.

Daylight, Sunlight and Overshadowing

4.30 In terms of daylight and sunlight, measures including massing alterations were implemented during the design process to minimise the impacts on daylight to surrounding sensitive receptors as much as possible while still ensuring the provision of a viable scheme.

4.31 Design alterations were made to Block N within the Development, including changes to the design of living spaces and window sizes. Alterations were also made to the proposed design of balconies within the Block N to reduce daylight and sunlight losses.

References

[i] London Borough of Wandsworth, October 2014. Alton Area Masterplan.
[ii] London Borough of Wandsworth, October 2015. Wandsworth Local Plan Supplementary Planning Document: Roehampton.
[iii] London Borough of Wandsworth, March 2016. Wandsworth Local Plan Site Specific Allocations Document.
[iv] London Borough of Wandsworth, March 2016. Wandsworth Local Plan Core Strategy.
[v] WSP, April 2015. Roehampton Supplementary Planning Document Sustainability Appraisal.

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Chapter 5 Construction Methodology and Phasing

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5.0 CONSTRUCTION METHODOLOGY & PHASING

Introduction

5.1 This chapter describes the anticipated demolition and construction methodology and phasing of the Development. Consideration of likely significant effects on the environment that may arise during the demolition and construction phase, and any necessary mitigation measures, are provided within the respective technical chapters of this ES.

5.2 Planning for demolition and construction is necessarily broad at this stage and may be subject to modification. This chapter is based on reasonable assumptions and experience and allows assessment of the realistic "worst case" demolition and construction phase effects.

Anticipated Programme

5.3 Demolition and construction of the Development is anticipated to commence in 2020, subject to gaining planning permission, and span approximately 10 years. Overall, the demolition and construction process is expected to be completed by 2030. Table 5.1 and Figure 5.1 show the indicative demolition and construction and phasing programme for the Development.

Table 5.1 Indicative Demolition and Construction Phasing

Development	Anticipated Start Date	Anticipated Completion Date
• Blocks A, M, O; • Alton Activity Play Area improvements; and • Roehampton Village Square Public Realm	Q1 2020	Q1 2023
• Blocks K, N, Q; • Demolition and construction of Portswood Place Nursery, Children's Centre and Health Facility, and • Downshire Field Public Open Space Improvements.	Q3 2022	Q3 2027
• Blocks B, C, D/E, F, G, H, I & J	Q3 2026	Q2 2030

Note the above periods overlap and are indicative dependant on the Main Contractor's desired demolition and construction programme.

Decanting Strategy

5.4 A number of existing residents currently living on site will need to be rehoused prior to demolition commencing. The following decant strategy is proposed:

- Residents of 1-29 Danebury Avenue, 1-14 Portswood Place and 2a Minstead Gardens will be offered replacement homes in Bessborough Road (Sherwood Lodge) or Early Move in 2020;
- Residents of 2-84 Harbridge Avenue (even numbers only), 1-45 Allbrook House and 1-28 Kingsclere Close will be offered replacement homes in Block A, Fontley Way and Bessborough (Sherwood Lodge) in 2022; and
- Residents of 1-115 Harbridge Avenue (odd numbers only) and 31-243 Danebury Avenue (odd numbers only) will be offered replacement homes in Block Q of the Development in 2026.

5.5 The indicative dates for the decant strategy are also shown on Figure 5.1.

Demolition and Construction Methodology

Demolition

5.6 Existing residential dwellings, non-residential facilities and associated structures across the Site would be demolished to ground level, including:

Detailed element:

- 134 existing homes;
- Existing retail facilities, including the Co-Operative and associated pharmacy;
- Allbrook House library;
- Eastwood Nursery School;
- Portswood Place retail floor space; and
- Danebury Avenue Surgery and Alton Medical Practice.

Outline element:

- 154 existing homes; and
- Retail floorspace along Danebury Avenue.

5.7 A plan showing the buildings that will be demolished is provided at Figure 5.2.

5.8 There would be a commitment to reuse demolition materials on the Site where appropriate. Any demolition waste removed from the Site would be sorted and taken to a recycling centre

to be disposed of or recycled in accordance with all relevant legislation.

Construction Machinery

5.9 Consideration has been given to the types of plant that are likely to be used during the construction works. The plant and equipment likely to be associated with the construction process is set out in Table 5.2.

Table 5.2 Plant used during the Construction Process

Type of Equipment	Required for Construction Phase
Tracked/wheeled 360 degree excavators	✓
Concrete Crushers	✓
Dumpers	✓
Mobile cranes	✓
Hand held tools including breakers (pneumatic and hydraulic)	✓
Power tools including percussion drills, cutting disks, pipe-threaders	✓
Piling equipment	✓
Wheel washing plant	✓
Scaffold	✓
Mobile access platforms	✓
Delivery trucks	✓
Skips / Skip trucks	✓
Forklift trucks	✓
Ready mix concrete wagons	✓
Concrete placing booms & pumps	✓
Road sweepers	✓

Enabling Works

5.10 Enabling works will comprise:

- Arboricultural works – including the protection of trees/vegetation to be retained and removal of trees/vegetation where applicable;
- Ecological works, where required;
- Installation of any site hoarding and security fencing;
- Ground modelling works including topsoil stripping and stockpiling for later use;
- General clearance; and
- Installation of temporary surface water management measures.

5.11 As explained in Chapter 2 of this ES, the Site is not considered to be heavily contamination. Intrusive site investigations will be undertaken prior to building out of each phase of the Development and any contaminants found will be dealt with appropriately, thereby remediating any contamination and the associated risk to future users of the Site.

5.12 The Site is within an area at medium to high risk of unexploded ordnance (UXO) being present. Prior to the development of each phase, specialist studies into the potential for UXO will be undertaken to ensure any risk is appropriately dealt with.

Excavation and Sub-Structure Works

5.13 Excavation work, preparation of ground works and installation of foundations would take place at this stage. As a worst case, it has been assumed that piled foundations will be required.

5.14 Sub-structure works may involve:

- Localised re-grading within the Site to create level development platforms for the structures;
- Excavation for foundations and to allow installation of any below ground services; and
- Installation of ground slabs (ground bearing or suspended block) and supporting beams.

Drainage works

5.15 Temporary drainage infrastructure will be installed by the main development contractor to manage and regulate surface water run-off during the construction period.

5.16 All site works will be undertaken in accordance with CIRIA (2001) Control of Water Pollution from Construction Sites[i] which promotes environmental good practice for control of water pollution arising from construction activities.

5.17 Construction vehicles will be properly maintained to reduce the risk of hydrocarbon contamination and will only be active when required. Construction materials will be stored, handled and managed with due regard to the sensitivity of the local water environment and thus the risk of accidental spillage or release will be minimised.

5.18 In accordance with the Control of Pollution (Oil Storage) (England) Regulations 2001[ii], any tanks storing more than 200 litres of oil will have secondary bunding. Bunding will be specified having a minimum capacity of "not less than 110% of the container's storage capacity or, if there is more than one container within the system, of not less than 110% of the largest container's storage capacity or 25% of their aggregate storage capacity, whichever is the greater." Any above ground storage tanks will be located on a designated area of hardstanding. No underground storage tanks will be used during the construction period. Storage of liquids such as degreasers, solvents, lubricants and paints will be in segregated, bunded enclosures.

5.19 The construction drainage system will be designed and managed to comply with BS6031 "The

British Standard Code of Practice for Earthworks"[iii], which details methods that should be considered for the general control of drainage on construction sites. Further advice is contained within the Geotechnical Design, General Rules (BS EN 1997)[iv] which should be read in conjunction with Basis of Structural Design (BE EN 1990)[v].

5.20 The following control measures will also be incorporated into the Construction Environmental Management Plan (CEMP):

- Temporary surface water management system, for example oil interceptors, holding tanks to remove suspended sediment before discharge etc;
- Equipment maintenance;
- Wheel washing;
- Covering stockpiles; and
- Storage of substances in accordance with applicable legislation

5.21 Further information on the CEMP is provided below.

Construction of Superstructure

5.22 This stage will involve the construction of each main building structure and will include the pouring of concrete, the installation of steel frames, load bearing brick walls, reinforced masonry and the external building fabric.

Fit Out

5.23 Fit out of the Development will involve the installation of block work party walls, dry lining to internal walls, internal walls, domestic mechanical and electrical installations with fitted kitchens and bathrooms.

Landscaping

5.24 Landscaping works will involve some ground modelling works and the establishment of green spaces within the Site including soil preparation, tree and vegetation planting, seeding, construction of footpaths/cycle routes. The ground modelling works will be undertaken concurrently with the site preparation and substructure works outlined above.

Material and Resource Use

5.25 The primary construction materials to be used will include concrete, brick, steel columns and

beams, brickwork and blockwork, aluminium, glass and timber. Where possible, materials and resources used during the construction of the Development will be sourced from the local area. A proportion of timber will be purchased from responsible forest sources. In terms of material selection, 'A' rated materials from the Building Research Establishment's Green Guide to Specification[vi] will be preferred.

Construction Phase Vehicle Movements

5.26 Construction vehicle movements will be managed to minimise the impact on the local road network. Table 5.3 provides an indicative level of construction traffic trip generation associated with the construction phase of the Development.

Table 5.3: Demolition and Construction Traffic

Vehicle Type	Average Two-way Trips Per Day
HGV	82
Cars and Light Goods	209

5.27 The HGV movements would be dispersed across the working day outside of the AM and PM peak periods. The arrival and departure of light vehicles would be concentrated during the morning and evening periods, but would be less than the predicted levels of traffic during the operational phase of the Development.

Construction Traffic Access and Management

5.28 The main construction traffic route over the construction programme would be along the main arterial routes, most notably Danebury Avenue and Roehampton Lane as far as possible, to minimise the impacts on the local road network.

5.29 If abnormal or oversized loads are required to deliver materials to the Site, notice will be given to LBW, depending on the routing, and also the Police, the Fire Brigade, and other emergency services, sufficiently in advance of the required closure or diversion dates. Should any hazardous materials arise during the course of the works, these materials will be transported to a licensed disposal site using permitted routes as identified in the Construction Traffic Management Plan.

5.30 All vehicle unloading will take place within the Site and will not affect public highways or adjacent occupiers.

5.31 All management of construction traffic and access will be carried out in accordance with a

CEMP as set out below:

- Planning and managing both vehicle and pedestrian routes;
- The elimination of reversing, where possible;
- Safe driving and working practices;
- Protection to the public;
- Adequate visibility splays and sight lines;
- Provision of signs and barriers; and
- Adequate parking for off-loading storage areas.

Controls to Protect the Environment

5.32 The environmental controls (or mitigation measures) to eliminate, reduce or offset likely significant adverse effects on the environment during the construction phase (as identified above) are identified below. It is anticipated that these controls will be secured by appropriately worded planning conditions or obligations:

- Preparation of a CEMP, which clearly sets out the methods of managing environmental issues for all involved with the construction works, including supply chain management;
- Requirement to comply with the CEMP included as part of the contract conditions for each element of the work. All contractors tendering for work will be required to demonstrate that their proposals can comply with the content of the CEMP and any conditions or obligations secured through the planning permission;
- In respect of necessary departures from the above, procedures for prior notification to LBW, as appropriate, and affected parties will be established;
- Establishing a dedicated point of contact and assigning responsibility to deal with construction related issues if they arise. This will be a named representative from the construction team;
- Production of a newsletter to be circulated to the surrounding neighbours and authorities; and
- Regular dialogue with LBW and the local community.

5.33 The preparation of a CEMP is an established method of managing environmental effects resulting from construction works.

5.34 The CEMP will be submitted to LBW (and other statutory authorities) prior to the commencement of the works. Compliance with the CEMP will be to be secured by planning condition. The structure of the CEMP will include the following:

- A table showing the objectives, activities (mitigation/optimisation measures), and responsibilities for the implementation of those activities;
- The broad plan of the work programme including working hours and delivery times;
- Details of prohibited or restricted operations (location, hours etc.);
- Institutional arrangements for its implementation and for environmental monitoring: responsibilities, role of the environmental authorities, participation of stakeholders;
- Contact during normal working hours and emergency details outside working hours;
- Provision for reporting, public liaison, and prior notification of particular construction related activities;
- The mechanism for the public to register complaints and the procedures for responding to such complaints; and
- The details of proposed routes for HGVs travelling to and from the Site.

Site Offices & Welfare Accommodation

5.35 Specific offices and accommodation for construction staff will be required and located on site.

Hours of Work

5.36 Working hours on the Site will be agreed with LBW through the CEMP. However, it is likely that the standard hours of work will be adhered to. These are:

- Monday to Friday, 8am to 6pm;
- Saturday, 8am to 1pm; and
- No working on Sundays, Bank Holidays or Public Holidays.

5.37 All work outside these hours will be subject to prior agreement of, and/or reasonable notice to LBW as appropriate.

5.38 Night-time working will be restricted to exceptional circumstances, and work internally with buildings. By arrangement, there may be some out of hours construction deliveries made to the Site.

Management of Construction Works

5.39 All contractors will be required to complete a method statement and risk assessment and obtain a works permit from the Applicant prior to commencement on site.

Response to Complaints

5.40 Any complaints will be logged on-site and, where necessary, reported to the relevant individual within LBW, as appropriate, (and vice versa) as soon as practicable.

Prior Notice

5.41 In the event of unusual activities or events, these will be notified to LBW, as appropriate, and relevant property owners or occupiers in advance. The relevant activities will be agreed with LBW, as appropriate, once the detailed programme of construction is defined. This will include:

- Necessary night-time, weekend or evening working (outside core areas) of a type which may affect properties; and
- Road or footpath closures/diversions and movements of wide loads (unlikely to be required).

5.42 The community will be kept informed during the construction phase through press adverts, LBW, and through direct notification to Parish Councils as appropriate.

References

[i] CIRIA C532 (2001) Control of Water Pollution from Construction Sites Guidance for consultants and contractors
[ii] The Control of Pollution (Oil Storage) (England) Regulations 2001, Statutory Instrument 2001 No. 2954
[iii] British Standards Institution (December 2009) BS6031:2009 Code of Practice for Earthworks
[iv] British Standards Institution (December 2004) BS EN 1997-1:2004 Eurocode 7. Geotechnical Design. General Rules.
[v] British Standards Institution (2002) BS EN 1990: 2002 Basis of Structural Design
[vi] Building Research Establishment Online Resource, available via http://www.bre.co.uk/greenguide

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 6 Population and Human Health

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6.0 POPULATION AND HUMAN HEALTH

Introduction

6.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of issues related to population and human health.

6.2 This chapter has been prepared by Barton Willmore who are Institute of Environmental Management & Assessment (IEMA) EIA Quality Mark registrants and have an established track record in the preparation of both socio-economic and population and human health ES chapters. They are, therefore, considered to be 'competent experts' as per requirements of the 2017 EIA Regulations.

6.3 This chapter identifies that the Development will provide:

- A moderate beneficial effect on population and housing through the demolition of 288 existing homes on the Estate and re-providing 1,103 new high-quality homes in a range of tenures of varying size, providing an improvement to the existing housing stock of the Estate and contributing towards LBW's future housing target;
- A major beneficial effect on local expenditure on the basis that the Development will introduce 815 net additional households to the area which are considered to generate an annual growth in commercial expenditure of £20.5m. In addition, the new resident workforce will deliver economic output (Gross Value Added (GVA)), estimated to be in the region of £88.1m per annum (based on current values);
- A moderate beneficial effect on employment through the replacement of existing commercial and community floorspace on the Estate totalling 9,339 sqm with new retail, employment and community facilities totalling 9,572 sqm. However, only 7,329 sqm of the existing 9,339 sqm non-residential floorspace is currently in-use, providing in the region of between 193 and 237 full-time equivalent (FTE) jobs. The Development will therefore provide a net additional 2,243 sqm of in-use commercial and community floorspace, calculated to provide in the region of between 243 and 296 FTE jobs. The Development is therefore expected to provide between 50 and 59 net additional FTE jobs in comparison to existing employment levels on the Site;
- A moderate beneficial effect on primary healthcare through the Development's provision of additional healthcare facilities which will increase GP provision by an additional 3 GPs. An additional 3 GPs would generate capacity to serve an additional 4,971 patients, yet the Development is anticipated to generate in the region of 1,932 new patients. The GP provision provided by the Development will therefore not only

meet the needs arising from the Development but also in the wider area where GP surgeries are currently operating above capacity;

- A moderate beneficial effect on wider human health through the creation of a high quality and vibrant mixed-use development which will make the best use of the existing land and positively contribute to the health of the residents within the Development and the surrounding area;
- A negligible effect on primary and secondary education given that the existing school provision have capacity to accommodate the 28 children of primary school age and 20 children of secondary school age expected to yield from the 815 net additional dwellings provided by the Development;
- A moderate beneficial effect on deprivation given that the Development is located within a part of LBW which is ranked within LBW's most 20% deprived. Therefore the Development will be regenerating one of LBW's most deprived areas, providing a range of social and economic related benefits thereby improving deprivation levels in the local area; and
- A major to moderate beneficial effect on open space through refreshing and reinvigorating the 82,574 sqm of existing provision and providing a further 5,117 sqm of open space. Furthermore, there is currently a deficit of play space provision in Roehampton and across LBW generally. In Roehampton, play space provision only totals 169 sqm currently but the Development will be providing 7,657 sqm of play space provision through a variety of types of play.

Policy Context

6.4 A summary of the national, regional and local planning policy relevant to this assessment is provided below.

National Policy

6.5 National Planning Policy is contained principally in the National Planning Policy Framework (NPPF) with the latest version published in February 2019[i]. At the centre of the 2019 NPPF is the principle of sustainable development, with three overarching objectives: economic, social and environmental.

6.6 The **social objective** supports strong, vibrant and healthy communities by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with

accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being (paragraph 8).

6.7 The **economic objective** is to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure (paragraph 8).

6.8 So that sustainable development is pursued in a positive way, at the heart of the 2019 NPPF is a presumption in favour of sustainable development, in which '*plans should positively seek opportunities to meet the development needs of their area, and be sufficiently flexible to adapt to rapid change*' (paragraph 11).

6.9 The NPPF is supported by Planning Practice Guidance (PPG)[ii] on a range of different topics. Guidance is provided in respect of Environmental Impact Assessments, but socio-economic considerations are not specifically addressed.

6.10 The Estate Regeneration National Strategy[iii] was published by Government in December 2016. The Government believes that estate regeneration can transform neighbourhoods by delivering well designed housing and public space, providing a better quality of life and new opportunities for residents, with estate regeneration having the potential to deliver thousands of net additional homes over the next 10 to 15 years.

Regional Policy

6.11 Regional planning policy is contained in the Draft New London Plan (August 2018)[iv]. The Draft New London Plan provides the spatial strategy and policy context to guide development in London. 'Good Growth' underpins the policies set out within the Plan with the aim to '*improve the health and quality of life of all Londoners, to reduce inequalities and to the make the city a better place to live, work and visit*' (paragraph 1.0.7).

6.12 The Plan acknowledges that London's population is projected to increase by 70,000 every year and to meet this increase in population there is a need for 66,000 homes, along with space for tens of thousands new jobs every year.

6.13 The Draft New London Plan sets a 10-year housing target for LBW of 2,310 dwellings per annum (23,100 in total over the period 2019/20 to 2028/29) providing an increase to the target of 1,812 dwellings per annum as set out in The London Plan 2016.

6.14 The Plan believes that planning for mixed-use developments in all parts of London will spread the success of London's economy and create stronger inclusive communities.

Local Policy

6.15 Local planning policy is contained in the adopted Wandsworth Local Plan – Core Strategy (March 2016)[v]. The Core Strategy sets the spatial strategy and policies to guide development in LBW over the period 2015 to 2030.

6.16 Policies in the adopted Core Strategy of relevance to this assessment include:

- Core Policy PL1: promotes the creation of attractive and distinctive neighbourhoods where deprivation and inequalities can be tackled through regeneration initiatives with the focusing of mainstream services and resources on the highest priority areas. Roehampton, within which the Site is located, is assessed by the CS to be within the highest relative deprivation assessment score;
- Policy PL4: protect and improve public and private open space and Green Infrastructure. The Council will require the provision of open space and/or secure public access to private facilities in areas identified as deficient in open space, play space or sport and recreation facilities. Deficiencies have been informed by the Open Space Study (February 2007)[vi] and open space requirements are based on the GLA proximity standards and summarised in Table 6.1 (below);
- Policy PL5: LBW will make provision for at least 25,860 net additional homes over a 14-year period, 2015/16 to 2029/30;
- Policy PL6: LBW intends to meet the needs of the local economy and states that, in areas lacking local jobs, like Roehampton, measures to promote additional employment through regeneration initiatives will be supported;
- Policy PL15 focuses solely on regeneration within Roehampton. The Council, working in partnership with residents and local organisations, is developing the Alton Area Masterplan, 2014[vii] the objectives of which will include attracting new investment into the area, making the area safer, providing better shopping, employment and community and leisure facilities.

6.17 Supplementary Planning Guidance (SPG) was specifically produced for Roehampton and adopted in October 2015[viii]. The SPG provides planning guidance for the implementation of the Alton Area Masterplan and contains 9 overarching strategic objectives to successfully deliver the vision for regeneration:

- Create a more mixed and balanced community with new and improved high-quality housing that will raise the living conditions and widen housing choice;
- Improve the quality of the retail, service and community facilities. Improve existing community buildings and create new facilities within existing Local Centre and Important Local Parade;
- Provide improved job and training opportunities for Roehampton residents;
- Adopt a place-making approach which protects, strengthens and repairs the special qualities of the estate through bespoke and sensitive intervention;
- Improve or replace poor-quality buildings;
- Improve pedestrian, cycle and vehicular connections within the site and to the surrounding streets, centres, communities and open spaces;
- Upgrade existing and create new streets, public spaces and pedestrian links to make them more attractive, convenient and usable;
- Create a more attractive area with a high-quality and active landscape by upgrading existing open spaces and creating new ones;
- Conserve and enhance existing heritage assets, including those on the Heritage at Risk Register, and their settings, to better reveal the qualities of the estate.

Table 6.1: Open Space Typology and Proximity Standards (GLA)

Type	Definition of Size	Recommended distance from home
Regional Parks (linked MOL)	400 ha	3.2km – 8.0km
Metropolitan Parks	60 ha	3.2km
District Parks	20ha	1.2km
Local Parks	2.0 ha	0.4km
Small Local Parks and Open Spaces	0.4 – 2.0 ha	0.4km
Pocket Parks	Under 0.4ha	Less than 0.4km
Linear Open Spaces	Variable	Where feasible

Source: LBW, Open Space Study, Table 4.1, Page 4-6. NB: ha = hectares

Assessment Methodology

Scope of the Assessment

6.18 The Site is located on the western edge of the LBW, immediately adjacent to Richmond Park to the west/south west, and within the administrative ward of Roehampton and Putney Heath ("Roehampton") (See Figure 6.1). The Site is located within the Alton Regeneration Area, the extent of which is illustrated in Figure 6.2. However, Putney Vale is also included for comparison. The Alton and Putney Vale Regeneration Area is defined as the following

five Lower Super Output Areas (LSOAs) combined: Wandsworth 13B, 23A, 23B, 23C and 23D (see Figure 6.2).

6.19 For the purposes of this assessment, baseline conditions for the Alton and Putney Vale Regeneration Area (APVRA) (where available) and Roehampton ward will be compared to those of LBW, the London Region and England as a whole, to ensure that the wider context is adequately represented.

6.20 As the Development comprises residential, employment and community uses, the following factors have been included in the assessment of likely significant effects:

- Construction phase employment generation;
- Changes in population numbers and structure once the Development is operational;
- Changes in levels of local expenditure following completion;
- Changes in levels of public open space;
- Changes in employment opportunities following completion;
- Changes in deprivation levels;
- Demands on primary healthcare services (GPs and dentists once operational;
- Demands on primary and secondary education infrastructure once operational; and
- Wider human health effects once operational (with reference to other relevant ES chapters and Appendix 2.2).

6.21 Construction phase effects on education and healthcare have been scoped out of the assessment as it is expected that the construction workforce and their families would use facilities near their place of residence. Effects are not anticipated to be significant.

6.22 The assessment comprises the following stages:

- Identification of baseline conditions with respect to these topics using information and statistics available in the public domain;
- Assessment of likely significant effects of the Development on the environment by reviewing the baseline conditions and determining the change attributable to the Development using published formulae and guidance to assess effects;
- Recommendation of mitigation or enhancement measures if necessary;
- Assessment of residual effects assuming implementation of the mitigation/ enhancement measures; and

- Assessment of the cumulative schemes described within Chapter 2: EIA Methodology for the potential to have likely significant cumulative effects on the environment when combined with the Development.

6.23 The assessment should be read alongside the Equality Impact and Needs Assessment prepared by Indigo Planning on behalf of Redrow Homes Limited, which considers the impact of the Development specifically on people with "protected characteristics" according to Section 149 of the Equality Act 2010. The Equality Impact and Needs Assessment will be submitted as part of the planning application.

6.24 The Development proposes up to 1,103 dwellings. The detailed element of the Development proposes 654 of the 1,103 dwellings and the outline element proposes the remaining 449 dwellings. Of the 1,103 dwellings, 288 are existing dwellings proposed for demolition and rebuild with the remaining 815 dwellings being additional in number on the Estate. As local facilities and services already accommodate the needs of the 288 dwellings to be reprovided i.e. within local schools and at local GP practices, it is considered appropriate to assess the additional demands placed on local education and healthcare infrastructure based on the 815 additional dwellings only.

6.25 The Development will be built in phases. It is considered that the effects on the human population from the demolition and construction process will result from issues such as air quality, noise, dust etc. and these will be covered by other technical chapters and summarised under Wider Human Health.

Population

6.26 Existing baseline demographic conditions are primarily based on Office for National Statistics (ONS) 2011 Census statistics and 2017 Mid-Year Population Estimates (MYPE). However, where appropriate to represent future baseline conditions, reference has been made to the ONS, 2016-based Sub-National Population Projections[ix] (SNPP), which are the most up-to-date projection series at the time of writing.

6.27 The anticipated construction period of the Development is from January 2020 to April 2030. The ONS 2016-based Household Projections[x] have been used to identify that, by the year 2030, the average household size in LBW is forecast to be 2.37 people. The size of population generated by the Development has been determined by multiplying the likely average household size of 2.37 by the number of residential units proposed by the Development.

Housing

6.28 Existing baseline conditions have been informed by the ONS, 2011 Census. Qualitative assessment is based on the contribution that the Development will make to the identified housing needs identified by planning policy and to addressing any historical shortfall in housing delivery through reference to the Wandsworth Local Plan – Authority Monitoring Report 2017/18.

Local Expenditure

6.29 A quantitative assessment is made on the potential for new residents living in the Development to increase spending on goods and services in the local area using household expenditure data published by Experian[xi].

6.30 The contribution that future residents will make to the Gross Value Added (GVA) output of the local economy is also assessed using the number of economically active residents and residents in employment from the ONS, Annual Population Survey (APS)[xii], for the 12 months to March 2018, applied to the total population anticipated to arise from the Development. The GVA output for LBW provided by Oxford Economics[xiii] is applied to the anticipated number of future workers to estimate the GVA contribution per annum. GVA is a measure of economic impact, distributed through retained profit and wages.

Employment

6.31 Existing baseline employment conditions in relation to economic activity have been informed by the ONS, APS[xiv], for the 12 months to September 2018. Ward level data is not available from this data source so cannot be calculated for Roehampton. Data for this indicator is presented for LBW, London and England. However, claimants of Job Seeker Allowance (JSA) have been considered for Roehampton to determine the number of people looking for employment and in which trades.

6.32 Baseline employment conditions in relation to occupational sectors have been sourced from the ONS, Business Register and Employment Survey (BRES) 2017[xv]. Baseline employment conditions in relation to commuting patterns have been informed by the ONS, 2011 Census [xvi].

6.33 The likely number of jobs generated during the construction phase has been assessed based on the Construction Industry Training Board (CITB), Labour Forecasting Tool (LFT)[xvii]. The LFT is able to produce labour forecasts based on historic data. The tool focuses on

forecasting labour demand on a month-by-month basis by each occupational group throughout the construction phase of the Development. The LFT calculations have been based on the floorspace schedules set out in Chapter 3: Site and Development Description and assume a build period of 2020 to 2030 (as detailed in Chapter 5: Construction Methodology & Phasing). The level of construction apprenticeships, and of indirect employment generated during the construction period, has been assessed qualitatively and based on professional judgement and experience of previous schemes.

6.34 The level of GVA per annum generated throughout the construction phase of Development is calculated by applying the GVA per construction worker per annum in LBW from Oxford Economics[xviii] to the likely number of jobs generated during the construction phase of the Development.

6.35 Operational phase employment has been calculated based on guidance provided by the Homes & Communities Agency (HCA), Employment Densities Guide, 3rd Edition, November 2015[xix] applied to the floorspace schedules by Use Class. Employment densities are provided for individual Use Class by either Gross Internal Area (GIA) or Net Internal Area (NIA). GIA floorspaces are available for both the existing and proposed non-residential uses of the Site. However, NIA floorspaces are only available for the existing non-residential uses of the Site, not for the proposed non-residential uses. Where employment densities require floorspaces by NIA, the NIA for the proposed uses has been calculated using the adjustment factor derived from existing uses.

6.36 Additionality factors such as leakage, displacement and composite multiplier effects have not been assessed on this occasion as levels of operational phase employment remain similar to the existing employment levels.

Primary Healthcare

6.37 General Practitioners (GP) Practice provision has been identified within proximity of the Site and illustrated at Figure 6.3. These Practices are all located within Roehampton and are all within 1km of the Site. The levels of under- or over-provision of GPs are determined through reference to the National Health Service (NHS) General and Personal Medical Services statistics[xx] which provide total patient list size for individual GP practices and the number of full time equivalent (FTE) GPs at each practice as at March 2018. The location data relating to each Practice has been sourced from NHS Business Services[xxi].). Assessment has been conducted by comparing the GP to patient ratios of local practices against the average for England of 1 GP for every 1,657 people to determine under- or

over-capacity. The ratio of 1 GP per 1,657 people is derived from GP workforce numbers published by NHS Digital[xxii] as at June 2017 and 2017 MYPE (also as at June 2017).

6.38 It should be noted that, whilst the Development is adjacent to the Roehampton University, students have access to their own free medical centre with which they can register. Out of term, the students can also attend the 'parent' Practice, the Putneymead Group Medical Practice. For this reason, it is assumed acceptable to omit student requirements when assessing local demands on primary healthcare.

6.39 The number of dental practices within proximity of the Site is also investigated and those practices accepting new patients identified via a targeted telephone survey. It is not possible to determine the precise number of patient places available as no central census of dentists is conducted and no definitive ratio of patients per dentist exists. However, analysis has been drawn as to availability of new patient registrations for both private and NHS patients, based on survey results. Dental practices are also illustrated on the accompanying Figure 6.3. They are all situated within Roehampton and located within the 1km of the Site.

6.40 As the number of reprovided households (288) will already be registered with primary healthcare providers, assessment will be based on the capacity for local primary healthcare to accommodate the population generated by the additional number of homes (815). The number of additional residents that could live on the Development (which is calculated using the household size statistics explained above) is then compared to the levels of capacity within the primary healthcare system to determine whether or not the existing provision will be able to accommodate the needs of the Development.

Wider Human Health

6.41 A qualitative assessment has been made of the potential for the Development to lead to likely significant effects with respect to wider human health issues. Health is a multidisciplinary topic and many individual technical documents submitted in support of the planning application are relevant to health.

6.42 A Health Impact Assessment (HIA) has also been undertaken and is provided as Appendix 6.1 to this chapter. The HIA assessment has been undertaken using the London Health Urban Development Unit (HUDU) Healthy Urban Planning Checklist[xxiii] and the HUDU Rapid HIA Tool[xxiv]. The assessment has reviewed the potential health effects of the Development and provided recommendations to seek to maximise health gains and remove or mitigate potential adverse impacts on health.

6.43 The World Health Organisation defines health as, *"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*[xxv]. For this reason, a wide-ranging assessment of health effects has been undertaken.

6.44 Construction phase effects of the workforce have not been assessed in detail because safe working practices would be adhered to in accordance with the requirements of the Health and Safety Executive and relevant legislation including The Construction (Design and Management) Regulations 2015[xxvi], which would minimise the potential for accidents and other situations with a detrimental effect on employees' health.

6.45 Construction and operational phase effects on nearby sensitive receptors including the local population have been assessed qualitatively, cross referencing the relevant ES chapters (including Chapter 10: Air Quality and Chapter 11: Noise and Vibration), the accompanying HIA (see Appendix 6.1) and standalone technical assessments submitted in support of the planning application. These include the following:

- Transport Assessment;
- Design, Landscape and Access Statement; and
- Planning Statement.

6.46 The conclusions of the planning documents have been used to indicate whether significant health effects would be likely, without and with mitigation in place. Professional judgment and knowledge of the baseline conditions of the local area have also been used to forecast how the health of the existing and future population / Site users may be affected by the Development.

Education

6.47 Those state-run primary and secondary schools accommodating pupils from the area in which Alton Estate is located have been identified via schoolsguide.co.uk and are illustrated on the accompanying Figure 6.4. The specific schools selected for assessment have then been verified with the LBW. For the purposes of this assessment Independent and Special schools have been excluded and the assumption made that all pupils generated by the Development would enter mainstream state-run schools, which is the worst case for assessment. Quantitative data in relation to the level of spare capacity at both primary and secondary phase was obtained through consultation with the LBW, School Place Planning and Data, Housing and Regeneration Department in October 2017 (see Appendix 6.3). Whilst the individual school capacities do not alter, the number of pupils on roll has been

updated to reflect the January 2018 annual schools census, to ensure that up-to-date spare capacity is represented.

6.48 In order to establish future baseline capacity, consultation has again been undertaken with the LBW, School Place Planning and Data, Housing and Regeneration Department (see Appendix 6.3). The method for calculating how many primary and secondary aged children are likely to be produced by the Development has been through use of the LBW Population Yield Calculator, which is publicly accessible online.

6.49 Assessment is quantitively based on the level of surplus or deficit school places identified versus the number of pupils generated by the additional housing element of the Development. The pupil yield arising from the Development has been calculated through use of the Wandsworth Population Yield Calculator[xxvii]. The Wandsworth calculator has been populated by the net additional dwellings to be provided (i.e. 1,103 less the 288 properties to be demolished).

Deprivation

6.50 Baseline conditions in respect of deprivation levels have been informed through reference to the Indices of Deprivation 2015[xxviii]. Specifically, the Index of Multiple Deprivation (IMD) component of the Indices provides a measure of deprivation, relative to other areas across the whole of England. The IMD is published for geographical statistical units called Lower Super Output Areas (LSOAs). LSOAs are smaller than wards and there are nine LSOAs located within Roehampton and Putney Heath ward. Consideration is given to the level of deprivation within Roehampton in terms of 'overall deprivation' ranking and each of the seven 'domains' of deprivation:

- Income;
- Employment;
- Health Deprivation and Disability;
- Education, Skills and Training;
- Barriers to housing and services;
- Crime and Disorder; and
- The Living Environment.

6.51 Assessment is qualitatively made in respect of the Development proposals and how this is likely to affect future deprivation levels within the area.

Public Open Space

6.52 Baseline conditions have been taken from the Wandsworth Open Space Study (February 2007) in relation to the typology and size of public open spaces in LBW. A qualitative assessment has been undertaken based on the proximity of the Site to existing open space and the quantum and accessibility of open space proposed by the Development.

Determining the Significance of Effects

6.53 There are no technical significance criteria relating to assessment of population and human health effects other than those that relate specifically to other technical areas such as pollution, noise etc. and these are dealt with in separate ES chapters, if necessary. The significance of effects is therefore assessed using professional judgement in line with the outline methodology for determining sensitivity and magnitude of effects within Chapter 2 EIA Methodology.

6.54 Quantitative calculations have been undertaken where possible e.g. surplus or deficit of pupil places and comparative GP to patient ratios, and the level of significance determined by the effect at either local, borough or county level. Where it is not possible to measure effects on a quantitative basis, a qualitative assessment is provided. Those effects which are considered to have a minor, moderate or major effect have been considered as significant and where effects have been established as significant adverse, appropriate mitigation measures have been identified. Effects are considered to be either temporary (during construction) or permanent (during operation) of the Development.

6.55 As noted earlier, of the 1,103 dwellings, 288 are existing dwellings proposed for demolition and rebuild with the remaining 815 dwellings being additional in number on the Estate. As local facilities and services already accommodate the needs of the 288 dwellings to be reprovided, it is considered appropriate to assess the additional demands based on the 815 additional dwellings only.

Baseline Conditions

Population – Age Profile

6.56 In 2017 there were estimated to be 10,100 people living within the APVRA. The APVRA has a younger age profile with a greater proportion of people aged 16-64 years (70%) than Roehampton (69%), LBW (68%) and England (63%). In contrast, only 9% of the APVRA's

population was aged 65+ years in 2017 which is marginally lower than Roehampton (10%) and considerably lower than the London (12%) and England (18%) averages.

6.57 Since 2011, the proportion of APVRA's population that is aged 0-15 years has increased from 19% in 2011 to 21% in 2017. In contrast, the proportion of APVRA's population aged 65+ years has decreased from 10% to 9% between 2011 and 2017.

Table 6.2: Age Profile by broad age group

2011 Census	APVRA	Roehampton	LBW	London	England
0 to 15 years	19%	18%	17%	20%	19%
16 to 64 years	71%	71%	75%	69%	65%
65+ years	10%	11%	9%	11%	16%
2017 MYPE	**APVRA**	**Roehampton**	**LBW**	**London**	**England**
0 to 15 years	21%	21%	18%	21%	19%
16 to 64 years	70%	69%	73%	68%	63%
65+ years	9%	10%	9%	12%	18%

Source: ONS, 2011 Census (Table KS102EW) and 2017 Mid-Year Population Estimates (MYPE)

Figures have been individually rounded and may not sum

Population – Projections

6.58 As previously noted, it is anticipated that construction of the Development will commence in January 2020 and be completed by April 2030. The ONS, 2016-based Sub-National Population Projections indicate that, by the year 2030, there will be approximately 341,900 people living in LBW. This figure represents a 3.5% growth in population between 2020 and 2030. Equivalent growth for London over the same period is 6.8% and England 5.0%.

Housing

6.59 The 2011 Census recorded approximately 130,493 households in LBW, 2.7% of which (3,491) are within APVRA. Key highlights from Table 6.3 illustrate that APVRA has a significantly higher proportion of flatted development (80% of total housing stock) in comparison to LBW (67%), London (53%) and England (22%). Terraced properties account for 13% of APVRA's housing stock, which is low in comparison to LBW (24%), London (23%) and England (25%). Similarly, 5% of APVRA's housing stock is semi-detached, which whilst low in comparison to London (19%) and England (31%) is only marginally lower than the average for LBW (7%). However, in contrast, whilst only 4% of APVRA's housing stock is detached, this is higher than the average for LBW (2%) and comparable to the proportion for London (6%).

6.60 Within the APVRA, nearly half of the households (46%) are living within socially rented properties. This proportion is significantly higher than the average for LBW (20%), London (24%) and England (18%). In contrast, APVRA has a significantly lower proportion of owner-occupied households (28%) in comparison to LBW (46%), London (48%) and England (63%).

Table 6.3: Household Accommodation Type and Tenure (2011 Census)

Type	APVRA	Roehampton	LBW	London	England
Detached	4%	5%	2%	6%	22%
Semi-detached	5%	4%	7%	19%	31%
Terraced	13%	11%	24%	23%	25%
Flats	80%	81%	67%	53%	22%
Tenure	**APVRA**	**Roehampton**	**LBW**	**London**	**England**
Owned	28%	29%	46%	48%	63%
Shared Ownership	1%	1%	1%	1%	1%
Social Rent	46%	46%	20%	24%	18%
Private Rent	25%	23%	32%	25%	17%
Living Rent Free	1%	1%	1%	1%	1%

Source: ONS, 2011 Census, Tables KS401EW and KS402EW

6.61 The Wandsworth Local Plan – Authority Monitoring Report 2017/18[xxix] provides details of housing completions in LBW since 2001/02. The London Plan 2016 sets LBW a housing target of 1,812 additional dwellings per annum over the 10-year period 2015/16 to 2025/26 against which LBW have assessed their annual housing completions. In 2015/16 LBW saw 2,776 dwelling completions; in 2016/17 a total of 2,345 dwelling completions; and in 2017/18 a total of 2,173 dwelling completions, therefore exceeding the annual London Plan 2016 target in all three years. However, the Draft New London Plan (August 2018) increases LBW's 10-year housing target to 2,310 dwellings per annum. In comparison to the Draft New London Plan target (2,310 per annum), completions for 2017/18 (2,173) fell below this. Furthermore, only 5 units were completed in Roehampton and Putney Heath ward, equivalent to 0.2% of all completions in LBW.

Employment

6.62 Data on the economic activity of local residents is available from the ONS, Annual Population Survey[xxx]. In the 12 months to September 2018, LBW recorded a total of 195,200 residents as economically active. Of these, 187,000 residents were in employment with 8,300 people being unemployed. As explained in the methodology section, APS data is not available for APVRA or Roehampton.

6.63 For comparison purposes, LBW recorded 79.8% of those aged 16 to 64 as being in employment compared to 74.5% in the London Region and 75.3% in England as a whole.

LBW has a notably low unemployment rate[1] (4.3%) compared to that of London (5.1%) and a comparable rate to England (4.2%) over the same period. There are, however, in excess of 1,370 residents claiming job seeker allowance in LBW, 120 of whom live in Roehampton[2].

6.64 The prime driver of the local economy in APVRA is Retail, employing 500 people in 2017 according to the 2017 Business Register and Employment Survey (BRES). This represents 31% of all people in employment in APVRA, which is significantly higher than the proportion for LBW (10%), London (8%) and England (9%). High levels of employment in APVRA are also within the Health industry (22%) and Education industry (17%). The high level of health-related employment will be due to the location of Queen Mary's Hospital and education-related employment will be due to Roehampton University being nearby. Table 6.4 provides a breakdown of employment sectors for Roehampton, LBW, London and England.

Table 6.4: Occupational Structure 2017 (ranked for APVRA)

Industry	APVRA	Roehampton	LBW	London	England
Retail	31%	10%	10%	8%	9%
Health	22%	16%	20%	11%	13%
Education	17%	35%	11%	8%	9%
Accommodation & food services	7%	7%	8%	8%	7%
Arts, entertainment, recreation & other services	6%	14%	6%	5%	5%
Information & communication	4%	2%	5%	8%	4%
Construction	3%	2%	4%	4%	5%
Transport & storage (inc postal)	3%	1%	4%	5%	5%
Business administration & support services	2%	5%	8%	11%	9%
Professional, scientific & technical	2%	3%	11%	13%	9%
Property	1%	1%	3%	2%	2%
Motor trades	1%	0%	1%	1%	2%
Agriculture, forestry & fishing	1%	0%	0%	0%	1%
Wholesale	0%	1%	4%	3%	4%
Manufacturing	0%	0%	1%	2%	8%
Financial & insurance	0%	0%	1%	7%	4%
Mining, quarrying & utilities	0%	0%	0%	1%	1%
Public administration & defence	0%	0%	4%	4%	4%
Total	100%	100%	100%	100%	100%

Source: ONS, 2017 BRES [downloaded from NOMIS 25 January 2019]

All figures have been rounded and may not sum

6.65 Census data indicates that residents of Roehampton travel an average of 12.5km to work, which is further than the average for LBW (10.3km) and London (11.2km) but shorter than the average for England (14.9km).

[1] Based on the proportion of economically active people aged 16 and over
[2] JSA as at December 2018

Primary Healthcare

6.66 There are currently four GP Practices operating within Roehampton (see Figure 6.3). Data acquired from the NHS General and Personal Medical Services Statistics for March 2018 provides patient list size and number of full time equivalent (FTE) GPs at each Practice. Table 6.5 indicates that one GP Practice is currently operating below the GP to patient ratio of 1 GP per 1,657 population. The Mayfield Surgery currently has a GP to patient ratio of 1:1,588. Were each of the four full-time equivalent GPs (as recorded by the annual GP census) to increase their patient list size to 1,657, capacity would be demonstrated for an additional 274 patients.

Table 6.5: GP Practices @ March 2018

No	Name	Postcode	Patients	GP	Ratio
1	Danebury Avenue Surgery	SW15 4DU	3,126	1.31	2,386
2	The Roehampton Surgery	SW15 4HN	5,851	2.13	2,747
3	The Alton Practice	SW15 4LE	3,852	1.75	2,201
4	Mayfield Surgery	SW15 4AA	6,354	4.0	1,588

Source: NHS Digital (March 2018) General and Personal Medical Services

6.67 A study of local dentist provision also identifies three dental practices within Roehampton (see Figure 6.3). The Practices are currently offering a mix of NHS and Private patient registrations (albeit the Westmoor Clinic operating on a referral basis only).

6.68 Whilst not primary healthcare, it is noteworthy that the Site is located to the south of the Queen Mary's Hospital, Roehampton which provides a wide range of medical services and includes the nearest minor injuries unit in proximity to the Site. In addition, to the south east of the Site is the Huntercombe Hospital – a psychiatric intensive care hospital for people with mental health conditions.

Wider Human Health

6.69 A review of the Health Profile for the LBW, available from Public Health England[xxxi], has been undertaken as part of this assessment. The Health Profile includes information on various health features and provides a comparison with data for London and England. Table 6.6 below presents the data recorded by Public Health England for the LBW. An extensive overview of the health baseline conditions at the Site are included within the HIA (Appendix 6.1)

Table 6.6: Summary of the Health Profile for LBW

Recorded Health Features for LBW	Comparison to Benchmark (London)	Comparison to Benchmark (England)	Recent Trend
Employment rate (aged 16-64)	Better		Increasing/Getting better
GCSEs achieved	Better		Could not be calculated
New cases of tuberculosis	Better	Worse	Could not be calculated
Smoking status at time of delivery	Similar	Better	No significant Change
New Sexually transmitted infections	Worse		Decreasing/Getting better
Under 18 conceptions	Similar		Decreasing/Getting better
Children in low income families (under 16s)	Better	Similar	Decreasing/Getting better
Obese children (aged 10-11)	Better	Similar	No Significant Change
Hospital stays for self-harm	Similar	Better	Could not be calculated
Hospital stays for alcohol related harm	Similar	Better	Could not be calculated
Hospital stays for alcohol related harm (under 18s)	Similar	Better	Could not be calculated
Hip fractures in older people (aged 65+)	Similar	Better	Could not be calculated
Infant mortality rate	Similar	Better	Could not be calculated
Killed and seriously injured on roads	Similar	Better	Could not be calculated
Under 75 mortality rate: cardiovascular	Similar		Could not be calculated
Under 75 mortality rate: cancer	Similar		Could not be calculated
Under 75 mortality rate: all causes	Similar		Could not be calculated
Suicide rate	Similar		Could not be calculated
Excess winter deaths	Similar		Could not be calculated
Life expectance at birth: male	Similar		Could not be calculated
Life expectance at birth: female	Similar	Better	Could not be calculated
Dementia diagnoses (aged 65+)	Similar		Could not be calculated
Excess weight in adults (aged 18+)	Better		Could not be calculated
Physically active adults (aged 19+)	Better		Could not be calculated
Smoking prevalence in adults (aged 18+)	Similar		Could not be calculated
Smoking prevalence: routine	Similar		Could not be calculated

Recorded Health Features for LBW	Comparison to Benchmark (London)	Comparison to Benchmark (England)	Recent Trend
and manual occupations			

6.70 The table above identifies that the list of recorded health features of LBW are generally better or similar to those recorded for England or the London Region with the exception of new sexually transmitted infections (STIs).

Education

6.71 Figure 6.4 identifies six primary schools and five secondary schools, all of which currently have pupils from the area in which Alton Estate is located on their Register (based on evidence obtained from www.schoolsguide.uk[xxxii] mapping of pupil residences). All local primary schools have a nursery, plus there is a standalone facility at Eastwood Nursery School. All secondary schools identified has sixth form facilities.

Primary Education

6.72 Table 6.7 identifies the nursery and primary schools, their individual pupil capacity and the number of pupils on roll as at January 2018. Figure 6.4 identifies the location of the primary schools in relation to the Site. The census indicates that there is an existing surplus of 295 primary pupil places within the search area. Of these 295 places, some 214 are at the Mosaic Jewish Primary school. As a faith school, the catchment area is much wider than the borough itself and some 50% of places are faith-based places. Therefore, of the surplus of 214 spaces in Table 6.7, 107 places have been deducted for the purpose of this assessment to reflect this. On this basis, the existing surplus of primary school places available to support new pupils could be 188.

Table 6.7: Existing Pupil Capacity of Primary Schools

Map No.	Name	Capacity @ 2017	Pupils @ 2018	Surplus / Deficit	Surplus / Deficit used in assessment
Nursery schools					
1	Eastwood Nursery	174	82	**92**	**92**
Primary schools					
2	Mosaic Jewish Primary School*	420	146	214*	107
3	The Alton School	210	216	-6	-6
4	Roehampton CofE Primary School	210	216	-6	-6
5	Heathmere Primary School	351	318	33	33
6	Sacred Heart Catholic Primary School	420	442	-22	-22

7	Granard Primary School	588	506	82	82
	Total Primary schools			**295**	**188**

Source: LBW, School Place Planning and Data / DfE Annual Schools Census Jan 2018

*Mosaic School is currently filling year on year and is currently accommodating up to Yr 5; therefore as Yr 6 has yet to be filled the surplus figure displayed deducts 60 places which will belong to Yr 6 pupils once open.

6.73 Consultation with LBW has established that there are no planned expansions to any of the above primary schools (see Appendix 6.3), although Granard Primary School has recently been enlarged by 1FE and the Mosaic Jewish Primary School is a relatively new provision.

Secondary Education

6.74 Table 6.8 identifies the existing secondary school provision with their individual capacities and the number of pupils on roll as at January 2018. Figure 6.4 identifies the location of the secondary schools in relation to the Site. The surplus/deficit calculations demonstrate that there are approximately 1,484 surplus secondary pupil places in proximity of the Site.

Table 6.8: Existing Pupil Capacity of Secondary Schools

Map No.	Name	Capacity	Pupils @ 2018	Surplus / Deficit @ 2018	Surplus / Deficit @ 2020*
1	Ark Putney Academy	1,200	626	574	874
2	Ashcroft Technology Academy	1,300	1,254	46	46
3	St Cecilia's Church of England School	1,000	934	66	216
4	Southfields Academy	1,645	1,177	468	468
5	Richmond Park Academy	1,100	770	330	330
	Total Secondary Schools			**1,484**	**1,934**

Source: LBW, School Place Planning and Data / DfE Annual Schools Census Jan 2018

2020 figures take account of planned expansion of Ark Putney and St Cecilia's C of E School

6.75 Whilst a notable surplus of secondary pupil places currently exists, LBW plan to provide additional secondary school provision in the local area, equivalent to 3FE (1FE at St Cecilia's and 2FE at Ark Putney). It is the aim of LBW to have the additional forms of entry available after 2020 (see Table 6.8) and the additional planned places will be used to accommodate pupil's resident on the existing and future Alton Estate[3].

6.76 Opportunities for higher education are enhanced by the adjacent proximity of the campus sites of the Roehampton University.

[3] LBW, School Place Planning and Data, email LBW to BW, 12th December 2017 (see Appendix 6.3)

Deprivation

6.77 According to the Indices of Deprivation 2015, LBW is ranked the 158th most deprived local authority in England (out of 326). However, within LBW there are pockets of considerable deprivation. Of the 179 Lower Super Output Areas (LSOAs) in LBW, 11 LSOAs are within the most 20% deprived nationally.

6.78 The Development will be located within the most deprived areas of LBW as indicated by the darker red shading on Figure 6.5 which maps the deprivation levels of LSOAs in LBW.

6.79 The Development extends across three LSOAs (Wandsworth 013A, Wandsworth 013B and Wandsworth 023A) as shown on Figure 6.5. Wandsworth 013B is the 8th most deprived LSOA in LBW (out of 179 LSOAs) and falls within the most deprived 10% of LSOAs in LBW on the: Income Domain; Employment Domain; Education, Skills and Training Domain; Health Domain; and Barriers to Housing and Services Domain. Table 6.9 details the IMD decile for each of these three LSOAs, for each of the seven deprivation domains. Decile 1 represents the most 10% deprived in LBW and decile 10 represents the least 10% deprived LSOAs in LBW.

Table 6.9: IMD 2015 LBW decile for LSOAs in which Development is located

Deprivation Domain	Wandsworth 013A	Wandsworth 013B	Wandsworth 023A
Overall IMD	2	1	2
Income	2	1	2
Employment	3	1	2
Health Deprivation and Disability	3	1	3
Education, Skills and Training	1	1	2
Barriers to Housing and Services	2	1	3
Crime and Disorder	4	5	3
Living Environment	10	10	8

Source: Indices of Deprivation 2015, MHCLG

Public Open Space

6.80 The LBW Open Space Study (February 2007) identified a total of 1060 hectares (Ha) of open space provision in LBW across 192 sites. Table 6.10 details the open space provision in LBW by type and size.

Table 6.10: Open space provision in LBW by type and size

Open Space Type	No. of sites	Area (Ha)	% of open space area
Regional park	1	104.53	9.9%
Metropolitan park	6	344.32	32.5%

District park	2	31.32	3.0%
Local park	6	23.75	2.2%
Small local park	14	12.87	1.2%
Pocket park	1	0.17	0.0%
Linear open space	8	122.06	11.5%
Public Park Total	**38**	**639.11**	**60.3%**
Allotments, community gardens and urban farms	5	3.67	0.3%
Amenity green space	69	127.08	12.0%
Cemeteries and church yards	14	74.16	7.0%
Civic spaces/pedestrianised areas	1	1.07	0.0%
Greenspaces within grounds of institution	17	71.3	6.7%
Natural or semi-natural urban greenspaces	4	1.95	0.2%
Outdoor sports facilities/playing fields (education)	23	31.73	3.0%
Outdoor sports facilities/playing fields (private)	15	101.43	9.6%
Outdoor sports facilities/playing fields (public)	4	9.07	0.9%
Provision for young people and teenagers	1	0.56	0.1%
Other	1	0.1	0.0%
Other Open Space Total	**154**	**421.2**	**39.7%**
Total Open Space	**192**	**1060.3**	**100.0%**

Source: Table 5.1, LBW Open Space Study (February 2007)

6.81 The levels of open space provision vary significantly between LBW wards. The LBW Open Space Study (February 2007) reports by 2001 Census electoral wards. The Development is located within the 2001 Census electoral ward of Roehampton, which corresponds to the current electoral boundary of Roehampton and Putney Heath which has been used as the Study Area for the baseline assessment. The Open Space Study identified that Roehampton has a total of 309.34 Ha of open space provision which is largest open space provision of all wards in LBW in terms of overall quantum of open space provision and also the largest provision per 1,000 population (23.78 Ha per 1,000 population)[4]. The average open space provision for LBW is 4.07 Ha per 1,000 population.

6.82 Of the 309.34 Ha of open space provision in Roehampton ward, 166.19 Ha is public parks. This is the second largest quantum of public provision in LBW, with Queenstown ward having the highest provision (183.58 Ha). Roehampton ward's public park provision equates to 12.77 Ha per 1,000 population which is significantly above the LBW average of 2.45 Ha per 1,000 population.

6.83 The large quantum of public park provision in Roehampton ward is due to the regional and metropolitan parks of Putney Heath and Wimbledon Common being located within the ward. However, it is important to note that the Site is also located adjacent to Richmond Park.

[4] Table 5.2, LBW Open Space Study (February 2007)

6.84 However, reference to Figures 5.1 to 5.3 of the LBW Open Space Study (February 2007) identifies that there is no provision of district parks, local parks, small local parks or pocket parks in Roehampton ward and such provision in other LBW wards is outside of the defined GLA catchments (set out in Table 6.1 of this assessment) for Roehampton ward residents.

6.85 In respect of children's play provision, the National Playing Fields Association (NPFA) recommend a minimum standard of outdoor space for children's play of 0.8 Ha per 1,000 people[5]. The LBW Open Space Study (February 2007) identified that across LBW the child's play provision is equivalent to 0.0134 Ha per 1,000 people, therefore falling significantly below the NPFA recommended standard. Within Roehampton ward specifically, the child's play space provision is equivalent to 0.0169 Ha per 1,000 people[6].

6.86 Child's play space provision can be classified as Local Equipped Areas for Play (LEAPs) and Neighbourhood Equipped Areas for Plan (NEAPs). Both LEAPs and NEAPs are accessible to the general public. The LBW Open Space Study (February 2007) only identified one LEAP in Roehampton ward located on Danebury Avenue/Highcliffe Drive Estate, located in the centre of Roehampton ward. However, this means that the north and south of Roehampton ward fall outside of the identified 400m catchment area for children's play facilities, resulting in the north and south of Roehampton ward being identified as deficient in children's play provision.

6.87 The Open Space Study identified a number of 'other' forms of children's play provision located within Roehampton ward which have the potential to be upgraded to either a LEAP or NEAP[7].

6.88 In respect of outdoor sports provision, the LBW Open Space Study (February 2007) identified a total of 169 pitches for football, cricket, rugby and hockey across LBW. However, only 42 of these pitches (25%) are available for casual use with the remaining 75% of pitches in secured community use or with no public access[8]. A further 201 outdoor sports facilities are available across LBW including: 137 tennis courts; 17 netball courts; 19 multi-use games areas; 7 basketball courts; 7 bowling greens; 3 softball pitches; and 4 athletic/running tracks[9].

6.89 The LBW Open Space Study (February 2007) identified 623.05 Ha of natural greenspace across LBW. 65% of LBW's natural greenspace is provided across six sites, two of which

[5] Paragraph 6.3, LBW Open Space Study (February 2007)
[6] Table 6.3, LBW Open Space Study (February 2007)
[7] Table 12.3, LBW Open Space Study (February 2007)
[8] Table 7.1, LBW Open Space Study (February 2007)
[9] Table 7.8, LBW Open Space Study (February 2007)

are located in Roehampton ward – Wimbledon Common and Putney Heath[10]. Roehampton ward is therefore not identified as being deficient in natural greenspace. Roehampton ward also has 268.55 Ha of Sites of Importance for Nature Conservation (SINCs) accounting for 32% of the LBW total – the highest of any ward in LBW[11].

6.90 A total of seven allotment sites were identified by the LBW Open Space Study (February 2007), one of which being located within Roehampton ward – Stag Lane (Putney Vale), located in the south westerly corner of the ward. A total of 60 plots are available at Stag Lane but all of these are occupied with a further 79 people waiting for a plot. The northern part of Roehampton ward is served by two allotment sites located in neighbouring West Putney ward (Pleasance and Dover House Road) but large parts of Roehampton ward are deficient of allotment space.

Likely Significant Effects

Construction Phase

Effects on Employment

6.91 The construction phases of the Development are expected to generate a significant number of jobs across all construction disciplines from ground workers to construction management. Based on calculations produced through use of the CITB, Labour Forecasting Tool (LFT), which are in turn based on the phasing and floorspace schedules provided in Chapter 3, it is anticipated that both the residential and commercial components of the Development, between the years 2020 and 2030 are likely to produce employment for an average of 242 full time equivalent (FTE) workers per month. These averages are considered to be a conservative estimate as they will be considerably enhanced by workers who will undertake demolition work and construct the open space and other landscaped areas for both the detailed and outline elements of the Development, not included within the above LFT calculations.

6.92 Based on average GVA per construction worker in LBW of £77,531 per annum (Oxford Economics, 2015-2018) over a 10.5-year construction phase (Q1 2020 to Q2 2030), a GVA of around £197m could be generated (=242 FTE workers x £77,531 x 10.50 years) from direct construction workers.

[10] Paragraph 8.9, LBW Open Space Study (February 2007)
[11] Table 8.4, LBW Open Space Study (February 2007)

6.93 The provision of 242 FTE direct construction jobs will have a positive effect on industries within the construction supply chain, referred to as the indirect effect. To deduce the indirect employment effect a type 1 employment multiplier of 1.89[12] has been applied to the direct jobs figure, resulting in an estimate that a further 215 indirect jobs will be supported during the construction period, generating £175m in GVA. In total, therefore a GVA of approximately £372m is likely to be generated.

6.94 Overall, the Development is considered to have a temporary, major beneficial effect on employment during the construction phase.

Wider Health Effects

6.95 Assessments of the effects of the Development on air quality and noise, all of which can have a bearing on health, have been included elsewhere in this ES (Refer to ES Chapter 10: Air Quality and Chapter 11: Noise and Vibration). A summary of the proposed construction mitigation measures in relation to both Air Quality and Noise and Vibration are set out below in Table 6.11, along with the residual effects of the Development following mitigation. These are also summarised in Chapter 14: Summary and Residual Effects.

Table 6.11: Significance during Construction – Air Quality and Noise and Vibration

Effect	Mitigation	Residual Significance
Air Quality		
Dust deposition and elevated PM_{10} concentrations	Standard high-risk mitigation measures from the SPG on 'the control of dust and emissions during construction and demolition' to be applied.	Not significant in relation to proposed and existing human health receptors and ecological receptors.
Elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations from construction traffic	No direct mitigation required.	Not significant in relation to existing human health receptor and ecological receptors.
Noise and Vibration		
Construction Noise	Procedures within the CEMP, including: • operate within approved construction hours; • no plant/equipment to be operational at night; and • Equipment switched off when not in use.	Minor Adverse
Construction Traffic		Negligible
Construction Vibration		Negligible

6.96 Suitable construction mitigation measures will include the implementation of a Construction Environmental Management Plan (CEMP), which would be secured by a planning condition.

[12] ONS, Type 1 multiplier, 2013

The CEMP would be in place throughout the demolition and construction phase to minimise effects from construction noise and dust on nearby residents and those living in the first phases of development at the Site. Accordingly, no likely significant effects have been identified at the construction stage on wider health effects.

Operational Phase

Effects on Population and Housing

6.97 The Development is anticipated to be complete by April 2030, by when the average household size within LBW is expected to be 2.37. The delivery of approximately 815 net additional dwellings could therefore be expected to generate homes for approximately 1,932 people.

6.98 LBW's Local Plan (adopted March 2016) makes provision for at least 25,860 net additional homes between 2015/16 and 2029/30. Authority monitoring has identified historic periods of shortfall in housing delivery but with an expectation of achieving completions above managed delivery targets if sufficient developments come forward. The Development will therefore contribute towards meeting LBW's housing target.

6.99 The Roehampton SPD (October 2015) identified that a number of homes within the Alton Area are sub-standard. The demolition of 288 existing dwellings and the provision of 1,103 new homes across the masterplan area is considered to provide an improvement to the existing housing stock and provide a new supply of high-quality homes in a range of tenures (including social rent, shared equity and market housing) of varying size. A total of 256 affordable homes (188 social rent and 68 intermediate) will be delivered as part of the regeneration, which provides a net increase of 98 affordable homes. Table 6.12 summarises the housing mix of the 815 net homes provided by the Development.

Table 6.12: Housing mix of the 815 net homes provided by the Development

Tenure	Existing dwellings	Proposed dwellings	Net dwellings
Social rent	158	188	98
Intermediate		68	
Private	130	847	717
Total	**288**	**1,103**	**815**

6.100 It is considered that both the detailed and outline elements of the Development will have a moderate beneficial significance of effect on population and housing.

Effects on Local Expenditure

6.101 On the basis that an additional, approximately 815 households will be introduced into LBW, there will be an increase in consumer spending per household as residents use local shops and services to meet their day to day needs. Spending on convenience and comparison goods and on leisure and services would be expected to increase and residents would be expected to use the on-site and local retail and leisure facilities.

6.102 Retail expenditure data from Experian, Retail Planner Data, 2015, reports the average annual household expenditure in LBW on convenience (food), comparison (non-food) and leisure goods and services as follows:

- Convenience = £5,039 per household per annum;
- Comparison = £8,408 per household per annum; and
- Leisure = £11,808 per household per annum.

6.103 Based on these figures, the provision of 815 net additional dwellings will generate an annual convenience goods expenditure of approximately £4.1m; comparison goods expenditure of £6.8m; and expenditure of leisure goods and services of £9.6m. In total, this equates to an annual growth in commercial expenditure of £20.5m.

6.104 The Development's net additional 815 dwellings could be expected to accommodate 1,932 residents. Based on the existing proportion of the total population that are economically active as determined in the baseline assessment (195,200 residents equivalent to 60.4% of the total population), the Development could be expected to accommodate 1,167 economically active residents, of which 1,118 residents would be assumed to be in employment.

6.105 The growing resident workforce will deliver economic output. Oxford Economics provide data on total GVA output and workforce jobs at a Borough level. Utilising this data, it has been established that within LBW, the GVA per worker is around £78,900 per annum. Based on 1,118 future residents assumed to be in employment, the Development could generate around £88.2m in GVA per annum (based on current values).

6.106 Effects on local expenditure are assessed as major beneficial.

Effects on Employment

6.107 The area has traditionally provided employment opportunities across a wide range of uses which comprises individual shops, cafes, betting shops, professional services (opticians), a laundrette and fast food takeaways. There is approximately 426 sqm of office (Use Class B1) floorspace within the Site, which comprises satellite housing offices for the Council and the MET Police. The Citizen Advice Bureau (Class A2) also have an office at 166 Roehampton Lane, which measures 162 sqm. In addition, a range of services are provided in the existing community floorspace which include: the Roehampton Library at Allbrook House, which is currently open 4 days a week; Eastwood Children's Nursery and Children's Centre provide childcare services from the buildings at 166 and 168 Roehampton Lane; the 'Base', 'Regenerate' and Roehampton youth centres located along Danebury Avenue, Portswood Place and Holybourne Avenue respectively; and two GP practices operate from within the Site, namely at the Danebury Surgery at 351 Danebury Avenue and the Alton Surgery at 208-210 Roehampton Lane.

6.108 The existing non-residential floorspace totals 9,339 sqm of which 6,083 sqm is currently used as community floorspace (Use Class D) and 3,256 sqm currently used as commercial floorspace (Use Classes A1-A3, A5 & sui generis and B1).

6.109 In respect of the community floorspace, of the existing 6,083 sqm on the Site, only 4,073 sqm is occupied with 2,010 sqm (33%) being currently vacant and therefore not being used to provide services for residents on the Estate. Table 6.13 presents the existing community floorspace by facility, indicating vacant and in-use floorspace.

Table 6.13: Existing Community Floorspace

Area	Facility	Vacant floorspace (Sqm GIA)	In-use floorspace (Sqm GIA)	Total floorspace (Sqm GIA)
Roehampton Local Centre	Roehampton Library	0	527	527
	Roehampton Base	0	210	210
	Roehampton Boys Club	200	0	200
	Roehampton Youth Club	0	336	336
	Alton Medical Practice	0	340	340
Roehampton Lane	166 Roehampton Lane (inc. Eastwood Nursery and excluding Citizen Advice Bureau (A2 use))	1,810	1,444	3,254
	168 Roehampton Lane (inc. Eastwood Children's Centre)	0	864	864
Portswood Place	Regenerate	0	48	48
	Danebury Medical Centre	0	226	226
	Minstead Gardens Clubroom	0	78	78
Total		**2,010**	**4,073**	**6,083**

6.110 The Development proposes to demolish the existing community floorspace and re-provide 5,527 sqm of community floorspace as detailed in Table 6.14.

Table 6.14: Proposed Community Floorspace

Facility	Floorspace (Sqm GIA)	Location
Library	1,214	Block A (Detail)
GP Facilities	652	
Base Youth Centre	321	
Community Hall	227	
Ancillary Community Floorspace	573	
Eastwood Nursery Eastwood Children's Centre	1,940	Portswood Place (Detail)
Danesbury health facility	477	Minstead Gardens (Detail)
Minstead Gardens Club Room	123	
Total	**5,527**	

6.111 Given that only 4,073 sqm of the 6,083 sqm of existing community floorspace is in-use, the Development's provision of 5,527 sqm of new community floorspace increases the quantum and quality of community floorspace on the Site by providing a range of services to residents of the estate as demonstrated in Table 6.15.

6.112 In respect of the commercial floorspace (Use Classes A1-A3, A5 & sui-generis and B1), the existing provision on Site equates to 3,256 sqm. All of this provision is being demolished and re-provided with 4,045 sqm (3,402 sqm flexible provision for Use Class A1-A3, A5, B1 and D1) and 643 sqm (Dedicated Class B1), again increasing the quantum and quality of commercial floorspace on the Site.

6.113 The new retail units that are to be constructed will benefit from a flexible use (that will include Class A1 to A3, A5, B1 and D1 uses). The future delivery and quantum of these uses will be predicated on the future needs for such floorspace. LBW will remain freehold owners of the premises, enabling the future provision of retail, office and community floorspace to be carefully curated to meet the needs of the community in the future. As such, scope exists through the provision of the flexibly designed commercial floorspace to deliver additional office and community floorspace to respond to future need.

6.114 Table 6.15 provides a summary of the existing and proposed floorspaces by Use Class.

Table 6.15: Comparison of Existing and Proposed Non-Residential Uses

Use Class	Existing Floorspace (Sqm GIA)	Existing Floorspace In Use (Sqm GIA)	Proposed Floorspace (Sqm GIA)	Difference (Sqm GIA)
Class A1 – A3, A5 & Sui Generis[13]	2,830	2,830	3,402	+572
Class B1 Uses	426	426	643	+217
Class D Uses	6,083	4,073	5,527	+1,454
Total Non-Residential Uses	**9,339**	**7,329**	**9,572**	**+2,243**

Source: Accommodation Schedule (190221)

6.115 Overall, when comparing the total quantum of non-residential floorspace, the Development would provide a net additional 2,243 sqm of non-residential floorspace in comparison to existing provision. One of the objectives of the Roehampton SPD is to consolidate the existing floorspace, improve the quality of community floorspace within the Site and re-provide this floorspace in a series of fit for purpose, flexible community hubs that draw together the disconnected facilities across the Site into dedicated and efficiently designed community floorspaces.

6.116 The vacant D Class Use community floorspace on Roehampton Lane (2,010 sqm) is not used to provide services for the residents of Alton Estate. The 4,073 sqm D Class use community floorspace that is in currently use, but that is of poor quality, is to be replaced with 5,527 sqm of new, improved quality Class D1 floorspace which will be used to better meet the needs of the new and existing community. The replacement community floorspace with enhanced services and facilities including a flexibly designed multi-purpose community hub comprising replacement library, café, office and community floorspace, medical facilities, youth centre, elderly residents club room and a community hall, will provide a focal point for the regeneration and the community. In addition, the Development also proposes to deliver a new Eastwood Nursery and Children's Centre plus community facilities at Portswood Place.

6.117 Specifically in relation to office space, the Roehampton SPD requires development proposals within the Roehampton Local Centre to create new employment opportunities for local residents by delivering approximately 400 sqm of additional B1 floorspace for small businesses and workspaces. 643 sqm of dedicated office (Class B1) floorspace (243 sqm in excess of requirement) will be provided by the Development. Approximately half of the space will be used as a replacement for the Council Housing Office that will provide a local facility for housing tenants to access. The remainder of the space will be used as affordable workspace to be made available to local businesses and community groups. In addition, the

[13] Proposed flexible planning use that includes for B1 and D1 uses beyond the reprovision of any existing floorspace for A1-A3 & A5 uses.

commercial floorspace in the outline element of the Development is subject to a flexible planning use (that includes offices) that will provide the opportunity for additional office accommodation if this is needed in the future.

6.118 The Development will therefore increase both the overall quantum and quality of non-residential floorspace, through the replacement of existing facilities and the provision of new and enhanced shops, community services and business spaces that will revitalise the Local Centre.

6.119 The Development will create a shopping parade at Danebury Avenue providing an improved quantum of retail floorspace. Replacement facilities will be provided for existing tenants. A new convenience food store will be delivered close to the junction between Danebury Avenue and Roehampton Lane, along with a small convenience store at Portswood Place. The commercial floorspace within the Roehampton Local Centre, has been designed so that it can accommodate a range of potential uses, including office and community uses, that can be tailored to account for future demand.

6.120 Table 6.16 seeks to compare the level of employment from the existing commercial and community floorspace, alongside that of the proposed commercial and community floorspace by applying employment densities from the HCA Employment Density Guide 2015.

Table 6.16: Comparison of Existing and Proposed Non-Residential Uses

Use Class	Floorspace (Sqm GIA)	Floorspace (Sqm NIA)***	Workers per sqm (FTE)	Indicative jobs (FTE)
Existing facilities				
Class A1 – A3, A5 & Sui Generis	2,830	2,651	15-20	133 to 177
Class B1 Uses	426	426	12*	36
Class D Uses	4,073^	4,008	165**	24
Total	**7,329^**	**7,085**		**193 to 237**
Proposed facilities				
Class A1 – A3, A5 & Sui Generis	3,402	3,187	15-20	159 to 212
Class B1 Uses	643	616	12*	51
Class D Uses	5,527	5,439	165**	33
Total	**9,572**	**9,269**		**243 to 296**

Source: Accommodation Schedule (21st February 2019)
^Excludes existing floorspace currently vacant
* Assumed density for B1a (offices) professional services/public sector
** Assumed mid-point of densities for Use Class D2
*** NIA taken from the accommodation schedule for the existing facilities. NIA for the proposed B1 floorspace is taken from Redrow's Summary Area Schedule. The NIA is not available for the other uses, so the proposed NIA calculated using adjustment factor derived from existing uses.

6.121 The existing commercial and community floorspace is estimated to employ in the region of between 193 and 237 FTE jobs. However, employment generation is anticipated to increase

to between 243 and 296 FTE jobs with the proposed new commercial and community floorspace.

6.122 The quality of the commercial and community floorspace will be improved and will provide opportunities for consolidated and better-quality community facilities in spaces that have been designed to be flexible. Through the increase in proposed floorspace of A1-A3, A5 and B1 uses, employment generation will increase providing between 50 and 59 net additional FTE jobs in comparison to existing employment levels.

6.123 The regeneration of Alton Estate to meet the objectives of the Roehampton SPD is therefore considered to have a beneficial effect on employment as well as on retail, community uses and public services.

6.124 Overall, it is considered that the Development will have a moderate beneficial effect on employment.

Effects on Primary Healthcare

6.125 The baseline evidence has identified that there are four GP Practices within walking distance of the Site. One of the four Practices (Mayfield Surgery) is operating with spare capacity, when compared to the England average of 1: 1,657 GP to patient ratio. If each full-time equivalent GP working at the Mayfield Surgery were to increase their patient list to 1,800 patients, there would be capacity to accommodate an additional 274 patients.

6.126 The overall Development will deliver a total of 1,103 dwellings providing home to approximately 2,614 people (1,103 x 2.37 average household size). However, of the 1,103 total dwellings, only 815 of these are additional dwellings. The remaining 288 dwellings are to replace 288 existing dwellings being demolished as part of the regeneration. It is assumed that primary healthcare infrastructure is already in place to meet the needs of the 288 dwellings and therefore effects on primary healthcare have been assessed in relation to the 815 dwellings only.

6.127 The 815 dwellings are estimated to be home to approximately 1,932 people (1,932 x 2.37 average household size). This assessment assumes that all 1,932 people will be new to the area and therefore will need to register with a new GP. This is a worst-case scenario as some residents are likely to already be from the local area and therefore already registered with local GPs.

6.128 The number of new residents (1,932 people) exceeds the surplus capacity within the local GP provision (276 places) and therefore the existing GP provision is likely to be insufficient to accommodate the needs of the Development.

6.129 However, the Development proposes the provision of additional healthcare facilities which will increase GP provision in proximity of the Site by an additional 3 GPs.

6.130 Based on the ratio of 1 GP per 1,657 patients, this increased GP provision would generate capacity for 4,971 patients. This compares with the number of net additional people anticipated to live in the Development of 1,932 people (i.e. 815 dwellings x average household size of 2.37). Therefore, the additional GP provision provided by the Development is in excess of the needs arising from the Development and will therefore also assist in providing GP services beyond the extent of the Development.

6.131 Survey data gathered on local dental practices identifies three establishments within walking distance of the Site. The Roehampton Dental Practice and the Maple Dental Surgery are both accepting new accepting new NHS and private patients. The Westmoor Clinic operates on a referral basis only. No central register of patient places is available for dental practices but given that two of the dental practices are accepting new patients, it is considered that collectively these practices are likely to be able to provide sufficient capacity to meet the needs of the Development.

6.132 Overall, it is considered that the Development is likely to have a moderate beneficial effect on primary healthcare.

Effects on Wider Human Health

6.133 Both the detailed and outline elements of the Development have been designed to include areas of green open space: the design objectives for the Development promote active lifestyles, through the provision of amenity and recreational open space on the Site, which is well connected. These are important for physical and mental wellbeing. Open spaces within the Development will be accessible to neighbouring residents and the links between the Site and surroundings will allow new and existing residents to integrate and make for an inclusive community.

6.134 The Development will include the provision of a series of footpaths and cycleways to improve linkages for pedestrians and cyclists through the Site. Transport improvements provided as part of the Development (refer to Chapter 9) will also improve access for cyclists at the Site. The alignment of the carriageway on Danebury Avenue where is joins

Roehampton Lane is proposed to be revised to provide improved cycle facilities via a mandatory cycle lane on the approach to the advanced cycle stop lane.

6.135 In addition, the Development will include improved and enhanced cycle parking facilities. Extensive provision of long-stay and short-stay cycle parking spaces will be provided for the residential blocks as well as for the commercial and community uses on the Site, allowing safe and secure cycle parking. The improved cycle access connections and cycle parking spaces would have wider human health benefits, increasing the numbers cyclists in the area and ensuring safe cycling.

6.136 As well as green space provision and improved access and linkages for pedestrians and cycles using the Development, the provision of new residential dwellings and enhanced community facilities as part of the Development (refer to ES chapter 3) would also have beneficial effects on wider human health, improving the health profile of the area. Consideration of the operational effects of the Development on human receptors in terms of Air and Noise and Vibration have also been considered as part of the ES and are set out in chapters 10 (Air Quality) and chapter 11 (Noise and Vibration). A summary of the proposed operational mitigation measures in relation to both Air Quality and Noise and Vibration are set out below in Table 6.17, along with the residual effects of the Development following mitigation. These are also summarised in Chapter 14: Summary and Residual Effects. These chapters conclude that the Development would have no significant effect on human receptors in terms of Air Quality or and Noise and Vibration.

Table 6.17: Significance during Operation – Air Quality and Noise and Vibration

Effect	Mitigation	Residual Significance
Air Quality		
Elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations from operational traffic and relocation of the bus turnaround	No direct mitigation required.	Not significant in relation to proposed and existing human health receptor and ecological receptors.
Noise and Vibration		
Fixed Plant Noise	Mechanical plant designed (in terms of noise source output) accordingly to the requirements of LBW	Negligible
Road Traffic Noise	None Required	Negligible
Relocation of Bus Turnaround		Negligible

6.137 The Development will enhance the opportunities already existing on the Site and improve the physical environment, raise the aspirations and improve the life chances of those living in what is one of the most deprived areas of LBW. Through the retention and enhancement

of open space areas on the Site, this will make it more of an attractive area for the surrounding communities to use. The Development will maintain the character and uses of the Site and enhance these to improve the quality of life for the existing residents. It will create a high quality and vibrant mixed-use development which will make the best use of the existing land and positively contribute to the health of the residents within the Development and the surrounding area.

6.138 On the basis of the above, overall the wider health effects are considered to be moderate beneficial as a result of the Development.

Effects on Education

6.139 Baseline evidence identified an existing surplus of 295 primary pupil places and 1,484 secondary pupil places within the catchment area of the Site.

6.140 The pupil yield arising from the Development has been calculated through use of the Wandsworth Population Yield Calculator. The Wandsworth calculator has been populated by the net additional dwellings to be provided (i.e. 1,103 less the 288 properties to be demolished) and the initial pupil yield is summarised in Table 6.18 below. The calculator outputs are presented in Appendix 6.2.

Table 6.18: Child yield (initial) from the Development

Age (years)	Number of children			
	Market	Intermediate	Social rented	Total
0-4	27.89	13.57	10.99	52
5-10	2.96	1.36	23.84	28
11-15	1.47	4.07	14.08	20
Total	**32**	**19**	**49**	**100**

Source: Wandsworth Population Yield Calculator, 2004 Housing Survey

6.141 Initial pupil yield reflects the number of children expected to be living in the Development as soon as it is built. Table 6.18 indicates that initial pupil yield from the Development is 28 primary age pupils (aged 5-10 years) and 20 secondary age pupils (aged 11-15 years). These comparatively low numbers reflect the fact that there is a higher proportion of larger properties within the 288 properties to be demolished than within the dwellings to be provided as part of the Development. People currently living within the properties to be demolished will already be attending schools.

6.142 Over time, the child yield from the Development will change. Table 6.19 indicates the pupil yield over time based on results of the Wandsworth New Housing Re-Survey (2007).

Table 6.19: Child yield (over time) from the Development

Age (years)	Number of children			
	Market	Intermediate	Social rented	Total
0-4	43.62	19.05	3.51	66
5-10	-0.54	10.36	8.41	18
11-15	1.62	0.00	17.40	19
Total	**45**	**29**	**29**	**103**

Source: Wandsworth Population Yield Calculator, 2007 New Housing Re-Survey

6.143 Over time, primary pupil yield from the Development decreases slightly (from 28 to 18 primary school aged children). Similarly, secondary pupil yield decreases from 20 to 19 children.

6.144 LBW has advised that whilst their primary school pupil forecasts did not take additional residential development within Roehampton into account, on an assumed basis of a cumulative additional 1,032 dwellings on the Alton Estate and within Roehampton Ward, the preliminary yield calculations demonstrate that the '*numbers would still leave us comfortably inside the 315 available places each year*' (see Appendix 6.3).

6.145 Based on the above yields, and in consideration of the fact that LBW's future school place planning has taken the regeneration of Alton Estate into consideration and concluded that there would still be places available at both primary and secondary level, it is considered that the Development will have an overall negligible effect on education.

Effects on Deprivation

6.146 Baseline evidence established that the Development extends across three LSOAs ((Wandsworth 013A, Wandsworth 013B and Wandsworth 023A). Wandsworth 013B is the 8th most deprived LSOA in LBW (out of 179 LSOAs) and falls within the most deprived 10% of LSOAs in LBW on the: Income Domain; Employment Domain; Education, Skills and Training Domain; Health Domain; and Barriers to Housing and Services Domain. Whilst not as deprived as Wandsworth 013B, LSOAs 013A and 023A both have some significant levels of deprivation falling within the most 20% deprived of LSOAs in LBW in nearly all of the seven deprivation domains.

6.147 As identified earlier in this assessment, the Development is considered to result in a number of social related benefits including: the demolition of 288 existing dwellings and provision of 1,103 new homes across the masterplan area, providing an improvement to the existing housing stock and providing a new supply of high-quality homes in a range of tenures and sizes; providing replacement community facilities including library, community hall and health services; and delivering new high-quality public realm, village square, open space enhancements, pockets parks and play spaces to provide a vibrant and interesting place for the local community.

6.148 The Development will also lead to a number of economic benefits including: the delivery of an enhanced retail offer; additional office floorspace; flexible consolidated and improved community/business space; and employment opportunities for local residents as part of the operation of additional retail and office floorspace.

6.149 As a result of the Development the Alton Estate will be regenerated into a high quality and vibrant environment that is considered to improve deprivation levels. It is therefore considered that the Development will have a moderate beneficial effect on deprivation.

Effects on Open Space

6.150 Baseline evidence established that there is a notably high provision of open space per 1,000 people in both LBW and Roehampton, largely due to the regional and metropolitan parks of Putney Heath and Wimbledon Common being located within Roehampton. However, a deficit of child's play space has been identified in both LBW and Roehampton. There is only one LEAP within Roehampton located on Danebury Avenue/Highcliffe Drive Estate and therefore within close proximity of the Development.

6.151 Across the Site currently there is a total of 82,574 sqm of open space provision (comprising 80,192 sqm of public amenity space, open space and play space and 2,382 sqm of communal and private amenity space). The publicly accessible amenity space is made up of areas of open space, such as Downshire Field and the village green, as well as areas of publicly accessible areas of incidental open space. Areas of communal amenity space are located around the blocks and enclosed from the general public.

6.152 A total of 87,692 sqm of amenity space is proposed for the Development. This comprises 80,493 sqm of publicly accessible space in the form of areas of open space and enlarged play space areas, plus 7,198 sqm of communal amenity space. The Development will result in a net increase of 301 sqm of publicly accessible amenity space across the Estate. The increase in the amount of publicly accessible open space will be achieved through new areas

of open space such as the new village square, pocket parks between residential blocks and new areas of incidental open space set around the newly formed residential blocks. Part of the publicly accessible open space area total is made up of enlargements to the existing play areas at Downshire Field and Alton Activity Centre.

6.153 The overall provision of open space within the completed Development will help to create a high quality and attractive landscape and make an important significant contribution towards the regeneration of this area and the quality of life of local residents.

6.154 Importantly, the Development proposes a mixture of children's play spaces across the Application Site. The proposed total play space provision amounts to some 7,657 sqm which exceeds both the GLA and LBW's benchmark by 4,038 sqm. Table 6.20 provides a detailed breakdown of the play space provision proposed by the Development alongside the GLA and LBW benchmarks.

Table 6.20: Proposed play space provision

Type	GLA benchmark (sqm)	LBW benchmark (sqm)	Proposed (sqm)
Doorstop play (0-5 years)	**1,520**	**1,520**	**1,578**
Local play (5-11 years)	**1,231**	**1,231**	**3,646**
All ages play (12+ years)	**868**	**868**	**2,433**
Total	**3,619**	**3,619**	**7,657**

6.155 Baseline evidence identified that Roehampton is currently deficient in terms of child's play space provision, with only one LEAP located within Roehampton. A mixture of children's play spaces is proposed across the regeneration including:

- Doorstop play facilities for 0-4 year olds will be provided within the communal courtyards located within the demise of the residential blocks;
- A play facility suitable for 5-11 year olds and an incidental play facility for all ages will be provided within the Village Square;
- A new play hub that will be open to the public will be provided at the Alton Activity Centre;
- A new play hub will be provided within Downshire Field where the existing play park will be replaced and enlarged;
- 'Play on the way' facilities suitable for all ages will be positioned around Downshire Field, linked to a new footpath that circles the open space, and throughout the streetscape within the main Development areas.

6.156 The Development is providing a) 87,692 sqm of open space provision (resulting in net additional open space provision totalling 5,117 sqm equivalent to an additional 6.2% from the existing provision); and b) replacing and enlarging child's play space provision across the Site by providing 7,657 sqm of play space provision, of which there is currently only 169 sqm of in Roehampton addressing the existing deficit in both Roehampton and across LBW. Overall, the Development is therefore considered to have a major to moderate beneficial effect on open space.

Mitigation Measures

Construction Employment

6.157 Construction of the Development will create approximately 242 full-time equivalent direct construction jobs every month during the build programme (2020 to 2030), plus apprenticeships and training opportunities. GVA of around £197m could be generated over the construction period. In addition, a further 215 indirect jobs could be generated as a result of the spin-off and multiplier effects which could generate a further £175m in GVA. In total therefore, a GVA of approximately £372m is likely to be generated by the construction phase of Development. No mitigation measures are required for construction employment as the Development will have a major beneficial effect.

Population and Housing

6.158 The Development is demolishing 288 existing dwellings on the Application Site (158 of which are Council tenanted and 130 of which are leasehold/freehold properties) and providing 1,103 new homes across a range of tenures (social rent, shared equity and market housing) and size, which are considered to provide an improvement to the existing housing stock and contribute to LBW's Local Plan housing target. The net additional 815 homes being provided by the Development is expected to generate homes for approximately 1,932 people.

6.159 As the Development is considered to have a moderate beneficial effect on population and housing, no mitigation measures are necessary.

Local Expenditure

6.160 The additional 815 households introduced through the Development will increase consumer spending in the local area as residents use local shops and services to meet their day to day needs. Spending on convenience and comparison goods, and on leisure services would also

be expected to increase as residents use the on-site local retail and leisure facilities being provided by the Development.

6.161 The 815 net additional dwellings will generate an annual convenience goods expenditure of approximately £4.1m; comparison goods expenditure of £6.8m; and expenditure of leisure goods and services of £9.6m. In total, this equates to an annual growth in commercial expenditure of £20.5m.

6.162 The growing resident workforce of the Development will also deliver economic output (GVA) estimated to be in the region of £88.2m in GVA per annum.

6.163 No mitigation is required in respect of local expenditure as the effects will be major beneficial.

Operational Employment

6.164 The Development proposes to demolish 9,339 sqm of existing non-residential floorspace and replace this with new retail, employment and community facilities totalling 9,572 sqm. In total, a net additional 233 sqm of non-residential floorspace will be provided by the Development. However, only 7,329 sqm of the existing 9,339 sqm non-residential floorspace is currently in-use. Therefore, the Development will provide a net additional 2,243 sqm of in-use non-residential floorspace.

6.165 The new commercial and consolidated and improved community floorspace provided by the Development will increase the quantum and improve the quality of the existing provision provided on the Site. The Development will provide new and enhanced shops, community services and business spaces that will revitalise the Local Centre. The quality of the floorspace will be improved and will provide opportunities for new community facilities in spaces that have designed to be flexible. 643 sqm of dedicated office (Class B1) floorspace will be provided by the Development. Approximately half of the space will be used as a replacement for the Council Housing Office that will provide a local facility for housing tenants to access. The remainder of the space will be used as flexible affordable office floorspace suitable for use by local small-to-medium sized enterprises.

6.166 The increase in proposed floorspace of A1-A3, A5, D1 and B1 Uses will increase employment generation in the local area. In total, the proposed commercial and community floorspace could be expected to generate between 243 and 296 FTE jobs, providing between 50 and 59 net additional FTE jobs in comparison to existing employment levels.

6.167 No mitigation measures are required for operational employment as the effects will be moderate beneficial.

Primary Healthcare

6.168 There is currently only surplus capacity of GP provision in the Mayfield Surgery, equating to capacity for 276 patients. The 815 net additional dwellings provided by the Development is expected to generate approximately 1,932 people meaning that the existing GP infrastructure would not be able to meet the needs of the Development.

6.169 However, additional healthcare facilities will be provided as part of the Development which will increase GP provision by an additional 3 GPs, meeting the requirement of the Roehampton SPD (October 2015). Based on the ratio of 1 GP per 1,657 patients, an additional 3 GPs would generate capacity to serve an additional 4,971 patients. Therefore, the GP provision provided by the Development will be sufficient to meet the needs arising from the Development (expected to be 1,932 people) and the wider area.

6.170 A telephone survey of the three dental practices within proximity of the Site also identified that both the Roehampton Dental Practice and the Maple Dental Surgery are accepting new NHS and private patients.

6.171 The Development has therefore been identified as having a moderate beneficial effect on primary healthcare and no additional mitigation is necessary.

Wider Human Health

6.172 The wider health effects of the Development once complete and operational are considered to not require any form of mitigation as the Development design has taken wider health considerations into account through the design process. Active lifestyles have been promoted as part of the design objectives for the Development, including through the green space provision and improved access and linkages for pedestrians and cycles using the Development. Wider human health effects have also been a consideration in the provision and design of the new residential dwellings and enhanced community facilities included as part of the Development.

Education

6.173 The net additional 815 dwellings provided by the Development will yield 28 primary age children (5-10 years) and 20 secondary age pupils (11-15 years). Baseline evidence

identified an existing surplus of 188 primary places and 1,484 secondary places in state run schools within proximity of the Development, sufficient to accommodate the additional demand for school places arising from the Development. The negligible effect on education is therefore not expected to require mitigation.

Deprivation

6.174 Through the enhancements the Development is making to the social and economic infrastructure, the Development is considered to provide a moderate beneficial effect on deprivation and therefore no mitigation is required.

Open Space

6.175 The Development is increasing the amount of local open space on the Site by 6.2% (a net additional 5,117 sqm). The overall provision of local open space within the completed Development will help to create a high quality and attractive landscape and make an important significant contribution towards the regeneration of this area and the quality of life of local residents.

6.176 In addition, the Development is replacing and enlarging child's play space provision across the Site, of which there is currently a deficit of across LBW and Roehampton. No mitigation measures are required for local open space as the effects have been assessed to be major to moderate beneficial.

Residual Effects

6.177 No mitigation measures have been identified and therefore effects with respect to construction and operational employment; population and housing; local expenditure; primary healthcare; wider human health; and open space would remain beneficial.

6.178 Effects on primary and secondary education will remain negligible.

Cumulative Effects

6.179 Consideration has been given to the cumulative scheme described within Chapter 2: EIA Methodology for the potential to have likely significant cumulative effects on the environment when combined with the Development.

6.180 The single cumulative scheme identified (Ref 2014/3330) relates to the construction of student accommodation. On the basis that this scheme will not generate permanent additional population, it is considered that population and human health effects are not likely to be significant (particularly in the light of the student medical centre available). On this basis, cumulative effects have not been considered further.

Summary

6.181 An assessment has been made of the likely significant effects of the Development on the environment with respect to population and human health issues. The assessment has considered the construction and operational phase employment effects and wider human health effects, together with operational effects on population and housing; local expenditure; provision of additional employment; demand for primary healthcare; wider human health effects and demand on primary and secondary education provision and effects on public open space. The baseline conditions have been established using published statistics, targeted telephone surveys and consultation with LBW.

6.182 The Development will provide 1,103 dwellings providing homes to in the region of 2,614 people. However, of the 1,103 total dwellings, only 815 of these are net additional to existing dwelling numbers and expected to generate homes for approximately 1,932 residents. The provision of additional housing stock in LBW will help to meet LBW's Local Plan housing target.

6.183 The Development is demolishing 288 existing dwellings on the Site (158 of which are Council tenanted and 130 of which are leasehold/freehold properties) and providing 1,103 new homes across a range of tenures (social rent, shared equity and market housing) and size. The Development is therefore considered to provide an improvement to the existing housing stock by providing 1,103 new high-quality as required by the Roehampton SPD (October 2015).

6.184 The Development is therefore considered to have a moderate beneficial effect on population and housing.

6.185 The 815 net additional households formed through the regeneration of the Alton Estate will increase the level of household expenditure in LBW on convenience (food), comparison (non-food) and leisure goods and services. Annual growth in commercial expenditure from these 815 households is estimated to be in the region of £20.5m.

6.186 In addition, 1,118 of the 1,932 new residents of the Development are anticipated to be in employment, contributing around £88.2m in GVA per annum to the economy.

6.187 In light of this analysis, the Development is considered to have a major beneficial effect on local expenditure and the local economy.

6.188 The commercial and community element of the existing Alton Estate is estimated to currently provide in the region of between 193 to 237 FTE jobs. The regeneration of the Alton Estate will see existing commercial and community floorspace demolished and replaced with new larger and enhanced shops, community services and business spaces that will revitalise the Local Centre. The spaces have designed to be flexible. As required by the Roehampton SPD, the Development consolidates and increases the provision of occupied community floorspace (Use Class D) by 1,454 sqm. The Development also increases the floorspace of A1-A3, A5 and B1 uses by 789 sqm. In total the proposed non-residential floorspace is expected to generate employment in the region of between 243 to 296 FTE jobs, thereby increasing existing employment generation by between 50 and 59 FTE jobs. The Development is therefore considered to have a moderate beneficial effect on local employment. The Development increases the provision of dedicated office space (Class B1) as required by the Roehampton SPD. Approximately half of the space will be used as a replacement for the Council Housing Office that will provide a local facility for housing tenants to access. The remainder of the space will be used as flexible affordable office floorspace suitable for use by local small-to-medium sized enterprises.

6.189 It has been assumed that the 288 dwellings being demolished and replaced will not provide any new demand for primary healthcare. Therefore, effects on primary healthcare have been assessed in relation to the 815 net additional dwellings only. The 815 dwellings are expected to provide homes for approximately 1,932 people. However, the capacity of existing GP provision within proximity of the Site is limited, with currently only spare capacity to accommodate an additional 276 patients. Therefore, existing GP provision is unable to accommodate the needs of the Development. However, healthcare facilities are being provided by the Development which will increase GP provision by an additional 3 GPs providing capacity to accommodate an additional 4,971 patients. The extension of primary health care services meets the requirement of the Roehampton SPD (October 2015). The expansion proposed will create capacity for approximately an additional 4,971 patients, which is in excess of the number of net additional people anticipated to live in the Development (1,932 people). The Development is therefore considered to have a moderate beneficial effect on primary healthcare, providing GP provision for both people of the Development and the wider area.

6.190 A telephone survey of the three dental practices within proximity of the Site also identified that both the Roehampton Dental Practice and the Maple Dental Surgery are accepting new NHS and private patients. On this basis, it is considered that these practices provide sufficient capacity to accommodate the needs of the Development.

6.191 The net additional 815 dwellings provided by the Development will yield 28 primary age children (5-10 years) and 20 secondary age pupils (11-15 years). Baseline evidence identified an existing surplus of 188 primary places and 1,484 secondary places in state run schools within proximity of the Development, sufficient to accommodate the additional demand for school places arising from the Development. LBW's pupil place forecasting has taken the needs of the Estate Regeneration into account and it is anticipated that on this basis the Development will have an overall negligible effect on education.

6.192 The wider human health effects of the Development are taken into consideration through the Development design and are considered to be moderate beneficial effects. Through the retention and enhancement of open space areas on the Site, this will make it more of an attractive area for the surrounding communities to use. The Development will maintain the character and uses of the Site and enhance these to improve the quality of life for the existing residents. It will create a high quality and vibrant mixed-use development which will make the best use of the existing land and positively contribute to the health of the residents within the Development and the surrounding area.

6.193 As required by the Roehampton SPD (October 2015), the Development is refreshing and reinvigorating the existing green and open space across the Application Site. The Development will retain and enhance the 82,574 sqm of existing open space on the Site and include a further provision of 5,117 sqm of open space, resulting in a total open space provision of 87,692 sqm. The overall provision of open space within the completed Development will help to create a high quality and attractive landscape and make an important significant contribution towards the regeneration of this area and the quality of life of local residents.

6.194 In addition, the Development is replacing and enlarging child's play space provision across the Site. There is currently a deficit of play space provision across LBW and Roehampton. Within Roehampton currently, play space provision only totals 169 sqm. The Development will be providing 7,657 sqm of play space provision. Doorstop facilities for 0-4 year olds will be provided within the communal courtyards, along with a play facility for all ages in the Village Square and new play hubs at the Alton Activity Centre and Downshire Field. The Development is therefore considered to have a major to moderate beneficial effect on local open space.

6.195 Through the enhancements the Development is making to the social and economic infrastructure, the Development is considered to provide a moderate beneficial effect on deprivation.

6.196 Table 6.21 contains a summary of the likely significant effects of the overall Development.

Table 6.21: Table of Significance – Population and Human Heath

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Effects on Employment	Temporary	Major Beneficial	None Required					*	*	*	Major Beneficial
Effects on Population and Housing	Permanent	Moderate Beneficial	None Required						*	*	Moderate Beneficial
Effects on Local Expenditure	Permanent	Major Beneficial							*	*	Major Beneficial
Effects on Employment	Permanent	Moderate Beneficial							*	*	Moderate Beneficial
Effects on Primary Healthcare	Permanent	Moderate Beneficial							*	*	Moderate Beneficial
Effects on Wider Human Health	Permanent	Moderate Beneficial	No mitigation required as all measures designed into the detail of the Development						*	*	Moderate Beneficial
Effects on Education	Permanent	Negligible	None Required						*	*	Negligible
Effects on Deprivation	Permanent	Moderate Beneficial	None Required						*	*	Moderate Beneficial
Effects on Open Space	Permanent	Major to Moderate Beneficial	None Required						*	*	Major to Moderate Beneficial
Cumulative Effects											
There are no cumulative effects in relation to Population and Human Health											

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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[v] LBW, Core Strategy, March 2016
[vi] LBW, Open Space Study, 2007
[vii] LBW, Alton Area Masterplan, 2014
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[ix] ONS, 2016-based Sub-National Population Projections
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[xxxii] www.schoolsguide.uk, at August 2017

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 7 Heritage, Townscape and Visual Effects

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7.0 HERITAGE, TOWNSCAPE AND VISUAL AMENITY

Introduction

7.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of heritage, townscape and visual amenity.

7.2 This chapter describes, with respect to heritage, townscape and visual amenity, the planning policy framework; the assessment methodology; the baseline conditions at the Site and surroundings; the likely significant environmental effects; the additional mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after these measures have been employed; and the likely cumulative effects with other schemes.

Legislative Context

Planning (Listed buildings and Conservation Areas) Act[i]

7.3 Listed buildings and conservation areas are subject to the Planning (Listed Buildings and Conservation Areas) Act 1990.

7.4 Section 66 (1) of the Act requires that in considering whether to grant planning permission for development that affects a listed building or its setting, the local planning authority should have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest.

7.5 In considering applications for planning permission with respect to any buildings or other land in a conservation area, Section 72 (1) of the 1990 Act requires that special attention be paid to the desirability of preserving or enhancing the character or appearance of that area.

Ancient Monuments and Archaeological Areas Act[ii]

7.6 The protection of the fabric of scheduled monuments is established by the Ancient Monuments and Archaeological Areas 1979 Act.

Policy Context

7.7 A summary of the relevant townscape, heritage, and visual amenity policy matters at a national, regional and local level is provided below, with further detail included in Appendix 7.2 and Appendix 7.4.

National Planning Policy Framework[iii]

7.8 The National Planning Policy Framework (NPPF), revised in July 2018 and with minor clarifications made in February 2019, promotes a presumption in favour of sustainable development, providing that it is in accordance with the relevant up-to-date local plan and policies set out in the NPPF. Paragraph 9 notes that planning policies and decisions should also take local circumstances into account to reflect the character, needs and opportunities of each area.

7.9 NPPF Paragraphs 124 – 132 focus on achieving well-designed spaces and seek to promote good design in the built environment. In particular, Paragraph 130 states that development proposals should be refused if they fail to take the opportunities available for improving the character and quality of an area and the way that it functions.

7.10 NPPF Paragraphs 184 – 202 deal with conserving and enhancing the historic environment. Paragraph 192 guides local planning authorities to take account of the desirability of sustaining and enhancing the significance of heritage assets, the positive contribution that the conservation of heritage assets can make to sustainable communities and the desirability of new development to make a positive contribution to local character and distinctiveness. Great weight should be given to an asset's conservation (Paragraph 193) with any harm or loss to the significance of a designated heritage asset requiring clear and convincing justification (Paragraph 194).

Planning Practice Guidance[iv]

7.11 To support the policies of the NPPF, the Government produced National Planning Practice Guidance (NPPG) in March 2014, which cover a number of topics and the NPPGs are regularly updated to provide up-to-date advice in relation to the implementation of the NPPF.

7.12 Under the Natural Environment NPPG (January 2016), the sub-section 'Landscape' in Paragraph 001 supports the use of landscape character assessment as a tool for understanding the character and local distinctiveness of the landscape and identifying the

features that give it a sense of place, as a means to informing, planning and managing change. The NPPG makes reference to Natural England guidance on landscape character assessment.

7.13 Under the sub-section 'Green Infrastructure', Paragraph 003 recognises that well-designed green infrastructure can help to create a sense of place and contribute to place-making, and that green infrastructure can help create safe and accessible environments in the regeneration of brownfield sites in existing built up areas.

7.14 Within the Design NPPG (March 2014), in the sub-section 'The importance of good design', Paragraph 001 notes that good quality design is integral to sustainable development and that decision makers should always seek to secure high quality design. The NPPG goes on to note that good design responds in a practical and creative away to the function and identity of a place whilst ensuring that spaces work well for everyone and will adapt to the needs of future generations.

7.15 Within the Conserving and Enhancing the Historic Environment NPPG (February 2018), in sub-section 'Historic Environment', Paragraph 001 states that protecting and enhancing the historic environment is an important component of the NPPF and that the appropriate conservation of heritage assets is one of the Core Planning Principles. Paragraph 002, in the same sub-section, makes clear that any decisions relating to listed buildings and their settings and conservation areas must address the statutory considerations of the relevant legislation, as well as satisfying the relevant policies within the NPPF and Local Plan. Paragraph 013 stresses that the impact of a development on the setting of a heritage asset must be taken into account.

Regional Planning Policy

The London Plan, March 2016

7.16 The London Plan (March 2016) is the overall strategic plan for London by which boroughs should set their detailed planning policies. Those of relevance to the Site and heritage, townscape and visual matters, are summarised below:

- Policy 5.3: Sustainable Development and Construction – outlines the need to promote and protect biodiversity and green infrastructure as part of sustainable design principles;
- Policy 5.10: Urban Greening – encourages new planting in the public realm and outlines that new developments should integrate green infrastructure at the beginning of the

design process, while noting that tree planting, green roofs and green walls can contribute to urban greening;

- Policy 5.11: Green Roofs and Development Site Environs – states that major development proposals should be designed to include roof, wall and site planting;
- Policy 7.4: Local Character – sets out a range of criteria to provide a high quality design response to a given Site's context and notes that developments should have regard to the form, function and structure of an area, while also noting that new developments should improve an area's visual or physical connection with natural features and be informed by the surrounding historic environment;
- Policy 7.5: Public Realm – states that public spaces should be secure, accessible and relate to local context, as well as incorporating the highest quality design, finishes and surfaces;
- Policy 7.6: Architecture – states that architecture should make a positive contribution to a coherent public realm, streetscape and wider cityscape by being of an appropriate proportion, composition, scale and orientation to define the public realm;
- Policy 7.7: Location and Design of Tall and Large Buildings – states that applications should include an urban design analysis to demonstrate that the proposal meets a range of criteria, including that they should relate well to the form, proportion, scale and character of surrounding buildings, urban grain and public realm, while improving the legibility of an area, enhancing the skyline, creating a positive relationship to the surrounding streetscape, and make a significant contribution to local regeneration;
- Policy 7.8: Heritage Assets and Archaeology – states that development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail; and
- Policy 7.11: London View Management Framework – outlines the strategic views across London.

The new London Plan, December 2017

7.17 The draft new London Plan was published for consultation in December 2017 and sets out an integrated economic, environmental, transport and social framework for development of London over the next 20-25 years. Within Chapter 2, Policy SD1 outlines that development within Opportunity Areas, such as the Site (as it lies within the emerging Great West Corridor Opportunity Area), should fully realise their growth and regeneration potential.

7.18 Under Chapter 3, which focuses on Design, it is noted in Policy D1 that developments should respond to their local context and be of high-quality architecture that simultaneously maximises the opportunity for urban greening. Chapter 7 deals with heritage and culture. Policy HC1 guides that development affecting heritage assets should conserve their

significance and the incremental cumulative impact should be actively managed. Policy HC2 guides that development proposals should conserve, promote and enhance their outstanding universal value.

Local Planning Policy

Wandsworth Local Plan: Core Strategy (Adopted March 2016)

7.19 The Wandsworth Local Plan: Core Strategy (Adopted March 2016)[v] sets out the Council's spatial vision and its guiding principles for planning in the London Borough of Wandsworth (LBW). Those of relevance to the Site and heritage, townscape and visual matters, are summarised below:

- Policy PL 1: Attractive and distinctive neighbourhoods and regeneration initiatives – outlines that local distinctiveness will be promoted, building upon the existing character and attractiveness of areas, while conserving and enhancing heritage assets and their settings;
- Policy PL 15: Roehampton – outlines that there will be comprehensive regeneration and new development in the area, which should result in the conservation and enhancement of the Roehampton Village, Westmead and Alton Conservation Areas and their settings; and
- Policy IS 3: Good quality design and townscape – notes that the council will protect and reinforce the existing character and heritage of the area, and that the layout, form and design of new buildings and space should contribute positively to the local environment, and that tall buildings will need to be of high architectural quality, respecting the local context and historic environment.

Development Management Policies Document (Adopted March 2016)

7.20 In addition, the Development Management Policies Document (Adopted March 2016)[vi] sets out the LBW's detailed policies for managing development in the borough, with those of relevance to the Site and townscape, heritage and visual matters summarised below:

- Policy DMS 1: General development principles – outlines that planning permission will be granted for development that through a design-led approach ensure that the scale, massing and appearance contributes positively to the local character and is sympathetic to local landscape characteristics while not adversely harming the visual amenity of nearby receptors;

- Policy DMS 2: Managing the historic environment – notes that applications affecting a heritage asset or its setting will be granted where they sustain, conserve and, where appropriate, enhance the significance, character and setting of the heritage asset and follow the criteria set out in the NPPF, the London Plan and relevant Historic England guidance and conservation area appraisals and management strategies;
- Policy DMS 4: Tall buildings – identifies the Site within Area D, meaning that buildings 5 storeys and above are deemed to constitute a tall building. Outlines that applications for tall buildings must show through a detailed design analysis that the proposal will have an acceptable visual impact on surrounding areas and be illustrated through computer visualisations and photomontages. Additional criteria is outlined, noting that the impact on the historic environment should be considered as well as describing how the proposals successfully sits within the townscape;
- Policy DMS 6: Sustainable Drainage Systems – outlines that soft landscaping and permeable surfaces should be incorporated within new developments;
- Policy DMO 1: Protection and enhancement of open spaces – notes that development should not harm the character, appearance of function of areas of open space;
- Policy DMO 3: Open spaces in new development – sets out that open space provision should be made, with preference for on-site provision in relation to larger developments;
- Policy DMO 4: Nature conservation – outlines that all development should result in gains for biodiversity, considering the use of native and priority species within new habitats and biodiversity features; and
- Policy DMO 5: Trees – notes that permission for development that result in damage to or loss of trees of amenity value should not be permitted unless in the interests of good arboricultural practice or adequate replacement planting is proposed.

Site Specific Allocations Document (Adopted March 2016)

7.21 The Site Specific Allocations Document (Adopted March 2016)[vii] provides additional design principles in relation to the Roehampton area, which includes a Masterplan area, and 5 additional sites identified within the Area Spatial Strategy, of which 2 partly coincide with the Site: Danebury Avenue (Site Allocation 86), and 166-170 Roehampton Lane (Site Allocation 86D).

7.22 In relation to the Danebury Avenue area it is noted that the mature trees should be retained and that the architectural style of new buildings should complement the modernist context whilst their height and massing should respect the sensitivities of the adjoining conservation areas. In relation to 166-170 Roehampton Lane it is noted that any redevelopment of the

buildings should seek to enhance the character and appearance of the conservation area and the setting of Downshire House.

Roehampton Supplementary Planning Document (2016)

7.23 The Council's Roehampton Supplementary Planning Document (SPD) sets out nine strategic objectives (the 'golden threads') for the regeneration proposals to achieve, which include:

- New Homes - Create a more mixed and balanced community with new and improved high-quality housing that will raise the living conditions and widen housing choice;
- New Community & Commercial Facilities - Improve the quality of the retail, service and community facilities. Improve existing community buildings and create new facilities within existing Local Centre and Important Local Parade;
- Employment - Provide improved job and training opportunities for Roehampton residents;
- Place-making - Adopt a place-making approach which protects, strengthens and repairs the special qualities of the estate through bespoke and sensitive intervention;
- High-Quality Buildings - Improve or replace poor-quality buildings;
- Permeability - Improve pedestrian, cycle and vehicular connections within the site and to the surrounding streets, centres, communities and open spaces;
- Attractive Streets - Upgrade existing and create new streets, public spaces and pedestrian links to make them more attractive, convenient and usable;
- Enhanced Open Spaces - Create a more attractive area with a high-quality and active landscape by upgrading existing open spaces and creating new ones; and
- Setting of Heritage Assets- Conserve and enhance existing heritage assets, including those on the Heritage at Risk Register, and their settings, to better reveal the qualities of the estate.

Other Guidance

Historic England: Historic Environment Good Practice Advice in Planning 3: The setting of Heritage Assets

7.24 Historic England's latest guidance[viii] on the setting of heritage assets recommends the following 'staged approach to proportionate decision-taking':

- Step 1: Identify which heritage assets and their settings are affected;
- Step 2: Assess the degree to which these settings and views make a contribution to the significance of the heritage asset(s) or allow significance to be appreciated;

- Step 3: Assess the effects of the proposed development, whether beneficial or harmful, on the significance or on the ability to appreciate it;
- Step 4: Explore ways to maximise enhancement and avoid or minimise harm;
- Step 5: Make and document the decision and monitor outcomes.

7.25 In respect of Step 2, Planning Note 3 recommends that the assessment should first address the key attributes of the heritage asset itself and then consider:

- the physical surroundings of the asset, including its relationship with other heritage assets;
- the asset's intangible associations with its surroundings, and patterns of use;
- the contribution made by noises, smells, etc. to significance; and
- the way views allow the significance of the asset to be appreciated.

7.26 The guidance provides a (non-exhaustive) checklist of the potential attributes of a setting that it may be appropriate to consider in order to define its contribution to the asset's heritage values and significance. This includes its topography, the scale and 'grain' of the surrounding streetscape or landscape, its openness, views from, towards, through and across it, and its visual dominance, prominence or role as focal point.

Historic England: Historic England Advice Note 4 'Tall Buildings'

7.27 Historic England published Advice Note 4 'Tall Buildings' in December 2015[ix], which provides guidance for those involved in planning for and designing tall buildings, as well as local authorities and other interested parties. The guidance states that the delivery of tall buildings should be plan-led and should satisfy the following design criteria:

- *"Architectural quality;*
- *Sustainable design and construction;*
- *Credibility of the design;*
- *Contribution to public space and facilities;*
- *Consideration of the impact on the local environment (and particularly at ground level); and*
- *Provision of a well-designed inclusive environment."*

7.28 The guidance notes in Paragraph 4.5 that a high-quality tall building scheme will have a positive relationship with the following:

- *"Topography;*
- *Character of place;*
- *Heritage assets and their settings;*
- *Height and scale of development (immediate, intermediate and town-or city-wide);*
- *Urban grain and streetscape;*
- *Open spaces;*
- *Rivers and waterways;*
- *Important views including prospects and panoramas; and*
- *The impact on the skyline."*

Assessment Methodology

Built Heritage Methodology

7.29 The Built Heritage Methodology has been drawn from the published Standard and Guidance for Historic Environment Desk-Based Assessment of the Institute for Archaeologists[x]. The assessment methodology has also followed national guidance as defined by Historic England, with particular reference to Historic England's Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (2008)[xi] and Historic Environment Good Practice Advice in Planning 3: The Setting of Heritage Assets (2nd edition, 2017).

7.30 The aim of the methodology is to establish high standards for the scope and content of heritage impact assessments and to establish certain principles that will help to achieve consistency, credibility, transparency and effectiveness throughout the assessment.

7.31 The assessment of heritage effects, provided here and at Appendix 7.5, in common with the assessment of many other environmental effects, includes a combination of objective and subjective judgements, and it is therefore important that a structure and consistent approach is adopted to ensure that the assessment undertaken is as objective as possible.

7.32 The heritage assessment considers the impact of the Development on the sensitivity of built heritage receptors – identified designated and non-designated heritage assets – including their settings.

7.33 A separate Heritage Statement (which assesses the impact of the Development on the significance of heritage assets) has been undertaken as is included as Appendix 7.9.

Heritage Significance of Effect Criteria

7.34 The significance of effect thresholds for heritage effects is determined by considering the sensitivity of the receptor concerned alongside the magnitude of effect that will be experienced. Effects that are graded as being Major or Moderate are considered significant with respect to the EIA Regulations. Effects that are graded as Minor to Neutral constitute effects that are not considered significant.

7.35 The built heritage methodology is set out in full in Appendix 7.1.

Townscape and Visual Methodology

7.36 The landscape and visual methodology has been drawn from best practice guidelines and the Guidelines for Landscape and Visual Impact Assessment[xii]. The aim of these guidelines is to set high standards for the scope and content of landscape/townscape and visual impact assessments and to establish certain principles that will help to achieve consistency, credibility, transparency and effectiveness throughout the assessment.

7.37 The assessment of townscape and visual effects, in common with the assessment of many environmental effects, includes a combination of objective and subjective judgements, and it is therefore important that a structure and consistent approach is adopted to ensure that the assessment undertaken is as objective as possible.

7.38 A townscape assessment is the systematic description and analysis of the features within the townscape, such as landform; vegetation cover; settlement pattern; building forms; transport patterns; and land use; which create a particular sense of place. A visual assessment considers visual receptors, which are the viewers of and within the townscape, and includes locations such as residential and business properties; public buildings; transport routes; Public Rights of Way (PRoW) and public open space.

Townscape and Visual Significance of Effect Criteria

7.39 The significance of effect thresholds for townscape and visual effects is determined by considering the sensitivity of the receptor concerned alongside the magnitude of effect that will be experienced. Effects that are graded as being Major or Moderate are considered significant with respect to the EIA Regulations[xiii]. Effects that are graded as Minor to Neutral

constitute effects that are not considered significant. The townscape and visual methodology is set out in full in Appendix 7.3.

Future Baseline

7.40 Where relevant, the future baseline of the Site and its context was also considered, in order to account for ongoing change in the townscape, for example and developments that are under construction and which will have altered the townscape context to the Site by the time the Development would be likely to be initiated.

Limitations and Assumptions

7.41 Limitations to the assessment include:

- The baseline assessment has been based on information readily available at the time of undertaking the assessment;
- During site visits to the Site and surrounding area, weather conditions, the time of day and seasonal factors have influenced the visual assessment and photographic record of the environment;
- Access to private properties has not been obtained; and
- The assessment relies upon data held by Historic England's National Heritage List, Wandsworth Council's Local List of Buildings of Architectural or Historic Interest (November 2016) and the Greater London Historic Environment Record (GLHER). Any inaccuracies in this data may give rise to inaccuracies in the assessment. The assessment has also relied upon archive material held by the London Metropolitan Archives (LMA), the Historic England Archive, the National Archives, the British Library, the Royal Institute of British Architects (RIBA) Library and Wandsworth Local Studies & Archives. There are inevitably 'gaps' in the coverage of any archive in respect of the historical development of a large and complex site such as this one.

7.42 The following assumptions have been made in the assessment:

- Tall plant and machinery, including mobiles cranes, will be in place for the minimum practicable period of time; and
- With respect to judgement on townscape and visual susceptibility, the nature/form of the type of development proposed should be read as a residential-led scheme occupying the Site, extending to a maximum AOD height of 64.20m.

Baseline Conditions

7.43 A summary of the relevant heritage, townscape and visual amenity baseline conditions is provided below, with further detail included in Appendix 7.2 and Appendix 7.4.

7.44 The Site forms part of the existing settlement pattern of Roehampton as shown in Figure 7-1, with the historic village core of Roehampton adjoining the Site to the east, centered around the junction between the A306 Roehampton Lane, Danebury Avenue and Roehampton High Street. The Site itself consists of a variety of built form, including a series of point blocks (smaller footprint with massing arranged vertically), maisonettes and bungalows (and adjacent to the Le Corbusier inspired slab blocks (larger footprint with massing arranged horizontally)) - all sitting within the landscaped grounds of Downshire Field.

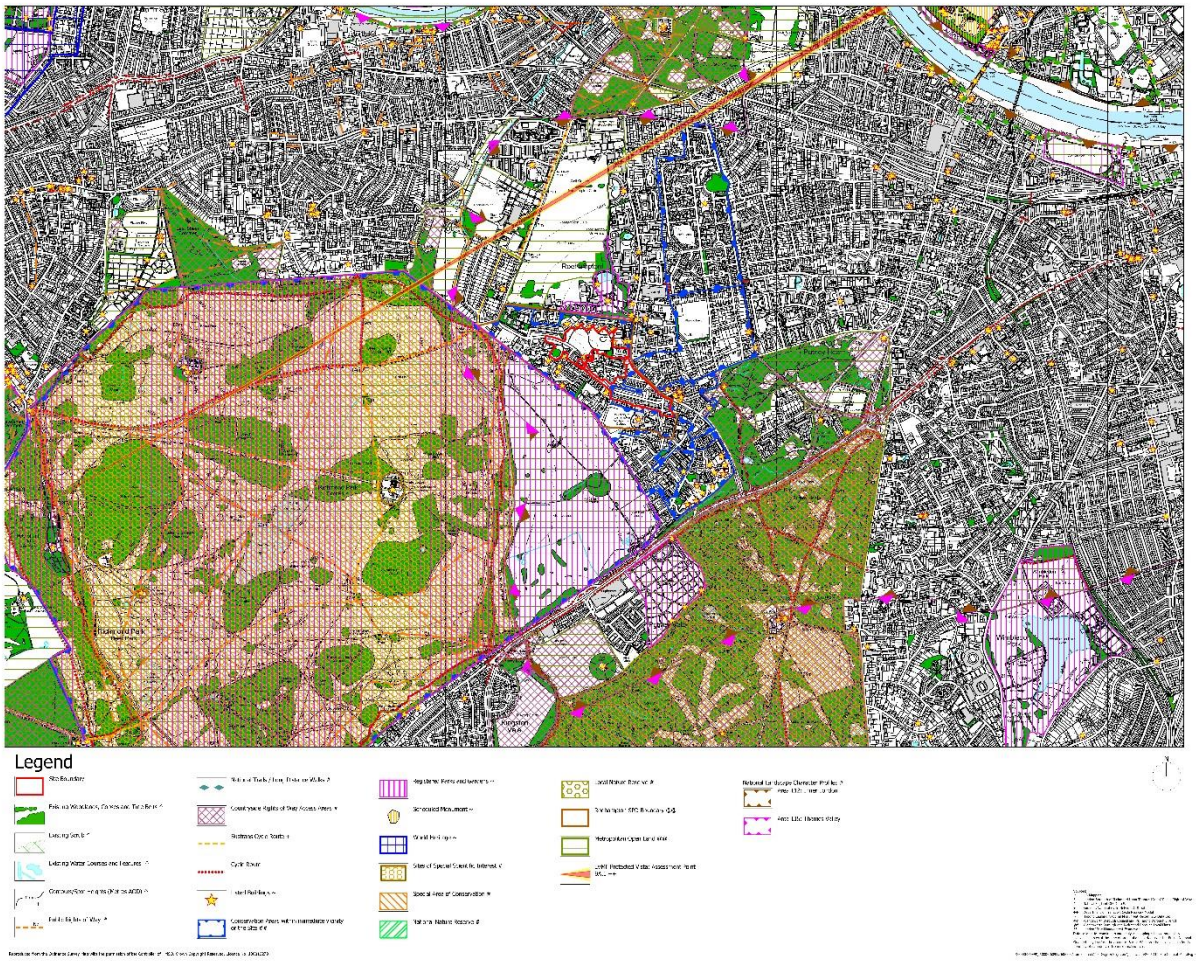

Figure 7-1: Site Context Plan

7.45 East of the A306 Roehampton Lane, the landform gently rises and consists predominantly of residential built form, with a pocket of commercial uses in the vicinity of Roehampton High Street. To the north and north-east of the Site there are a series of institutional uses and a well-vegetated golf course, with the built form generally of a larger scale and massing than

the built form to the east. South-east of the Site, west of the A306, the land use consists of residential built form (including student accommodation) and institutional uses.

7.46 To the west of the Site there are a series of point blocks and maisonettes, while to the south-west lies the partly wooded Richmond Park, which gradually rises in height and affords panoramic views across London.

7.47 Roehampton's historical development is evident in both its built and vegetated fabric, with the heritage and landscape assets serving as markers of key points in its development over time to the present day, affording a sense of time depth. The Site and surrounding area encompass the Alton Estate, which was originally built in the 1950s and was developed in two phases as part of a masterplan developed by London County Council (LCC). This masterplanned area overlays an 18th-century landscape that adjoins the Grade I Historic Park and Garden of Richmond Park.

7.48 Roehampton itself emerged as a residential suburb in the 18th-century following the opening of Putney Bridge, with a number of the built forms associated with the initial large private estates remaining to this day. However, over time these have been redeveloped and evolved into the form present today, with the Dover House Estate (located to the east of the Site) redevelopment of the 1920s typifying the Garden City Movement. The core of Roehampton village retains its traditional feel, contrasting with the built form within the Site.

7.49 With regards to published characterisations, the Site is identified at a national level within the south-western fringe of National Character Area (NCA) Profile 112: Inner London, and at a regional level within the South Thames Heath and Commons Natural Landscape Area. However, to provide a finer grain of detail to the published character assessments covering the Site and surrounding areas, a number of Townscape Character Areas (TCAs) were identified via desk-based study and fieldwork. The Site is identified across two TCAs: Alton West (TCA 4) and Alton Gardens (TCA 5) (as illustrated at Appendix 7.4: Townscape & Visual Baseline Conditions and in Figure 7-2).

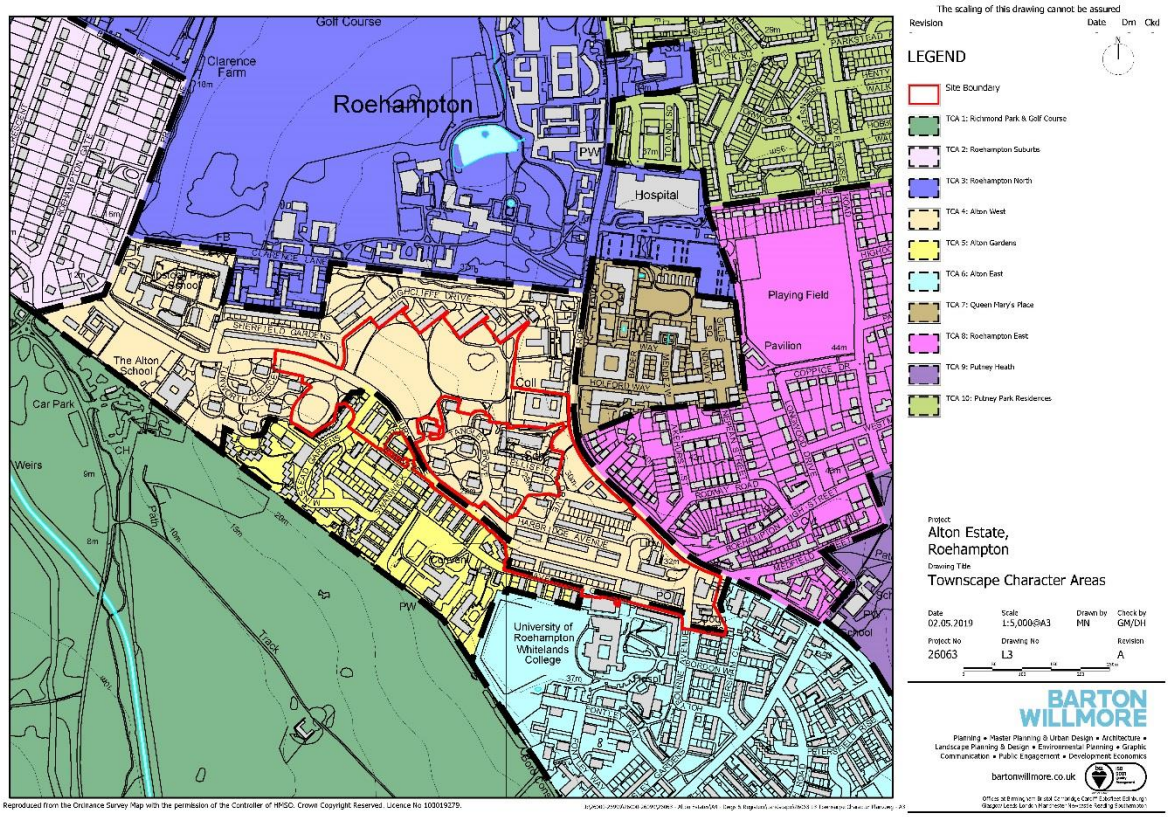

Figure 7-2: Townscape Character Plan

7.50 The Alton West TCA is characterised by its large-scale built form set within the landscaped grounds of several late 18th century estates. Danebury Avenue extends across the TCA and partly defines its southern extent. The Georgian three storey Downshire House (Grade II* listed) lies within the north-eastern part of the TCA and consists of brown brick elevations, recessed pitched slate roofing and red brick detailing.

7.51 Five eleven storey slab blocks (Grade II* listed) lie within the northern part of the TCA, while a further ten twelve storey point blocks are located in the vicinity of Tangley Grove, and seven in the vicinity of Tunworth Crescent. The tall buildings in the TCA are principally constructed with light coloured concrete façades, featuring regular fenestration and columns at ground floor level, which allow the landscaped grounds to permeate through the footprint of the built forms. Elsewhere, built forms are generally four storeys in height.

7.52 The Alton Gardens TCA is characterised by its low-rise built forms, comprising generally one storey bungalows (prefabricated) and two storey terraces, set amongst both private and public areas of open space. Danebury Avenue defines the northern extent of this TCA.

7.53 The stucco Grade I listed Mount Clare, dating from the 1770s, is a notable built form and is two and half storeys in height, featuring a three-bay projecting centre and a later enlargement of a pediment and wood Doric portico. The brick built Maryfield Convent, enclosed by a high brick wall, lies within the eastern part of the TCA and is nestled amongst mature vegetation. The predominant land use is residential (including student accommodation), although a small local retail centre is located adjacent to Danebury Avenue and is housed in a three-storey block.

7.54 A visual appraisal was undertaken, which demonstrated that from the elevated plateau landscape to the east of the Site, views of the Site are obstructed by the intervening vegetation and built form associated with the redeveloped Queen Mary's Place. However, glimpses of the existing built forms are obtained in views along the sloping streets that are orientated towards the Site. Similarly, views of the existing built form within the eastern part of the Site are obtained by those travelling along A306 Roehampton Lane, with the built form larger in its scale and massing than the typically two-to-three storey properties that lie to the east. Figure 7-3 demonstrates the scale of existing built form within the vicinity of the Site.

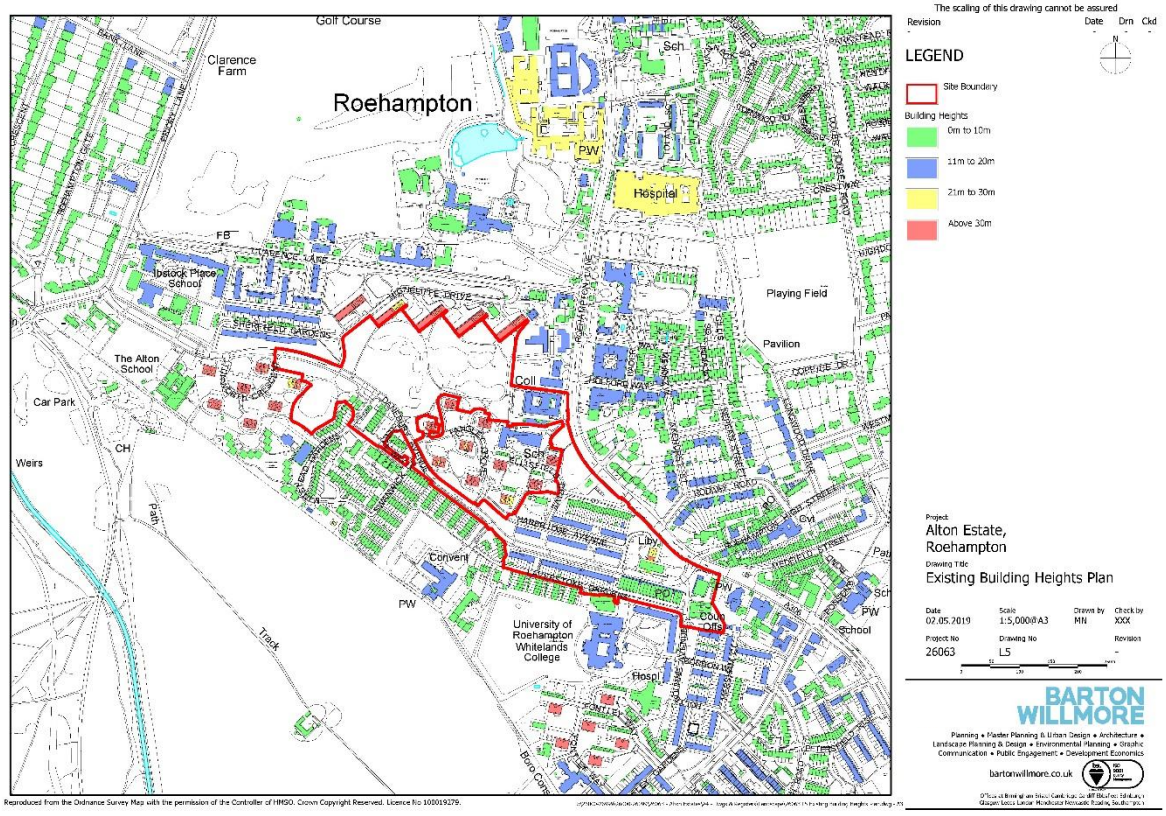

Figure 7-3: Existing Building Heights Plan

7.55 To the south-east there are isolated locations where the existing built form within the Site is visible, whereby the built form is comparable in scale and massing to the immediate

surroundings. However, for the most part its visibility is curtailed by intervening vegetation and built form. To the north-east there has been extensive redevelopment of the area along the A306 Roehampton Lane, including the provision of student accommodation adjacent to Downshire House and high-quality modern housing at Queen Mary's Place.

7.56 These modern built forms contrast with the existing built forms present within the north-eastern and eastern part of the Site. The four storey built forms, featuring regular fenestration, recessed balconies, and red brick walls, appear to be in a poor state of repair. Nonetheless, the buildings lie within a robust green network, including numerous semi-mature and mature trees, which form an extension to the landscaping associated with the parkland landscape of the Alton conservation area, including Downshire Field.

7.57 Danebury Avenue, which passes through the Site and is largely aligned to the former route of Priory Lane, runs to the south of Downshire Field. Within the central and western part of the Site the built form south of Danebury Avenue consists of a mixture of housing types, including one storey bungalows and two to three storey residences, which contrast with the point blocks and Corbusien inspired slab blocks to the north of Danebury Avenue.

7.58 The bulk of the slab blocks is somewhat masked by the slope of the landform and the way in which the *pilotis* at ground floor level allow for visual permeability across the landscaped area of Downshire Field and southwards towards the Site. To the north-west of the Site, vegetation within Downshire Field truncates visibility of the built forms in the Site, with traffic passing along Danebury Avenue heavily filtered by the intervening vegetation.

7.59 From the landscape to the west of the Site, comprising recreational space associated with Richmond Park, there are a number of elevated vantage points that offer views across the Site and further afield towards Wandsworth. However, from the majority of Richmond Park successive bands of woodland vegetation screen views and provide a sense of enclosure and physical containment. Where the Site is visible from Richmond Park, the built form visibly breaks the wooded skyline and is seen in the context of the imposing point blocks.

7.60 Those heritage assets that could potentially be affected by the Development were identified using professional judgement, following a series of Site visits and archive research. The list of heritage assets has also been refined through pre-application discussions with the LBW and Historic England. The following is intended as a summary; the historical development and sensitivity of each asset (including the contribution made in each case by the asset's setting) is discussed in detail at Appendix 7.2, with their spatial distribution shown in Figure 7-4.

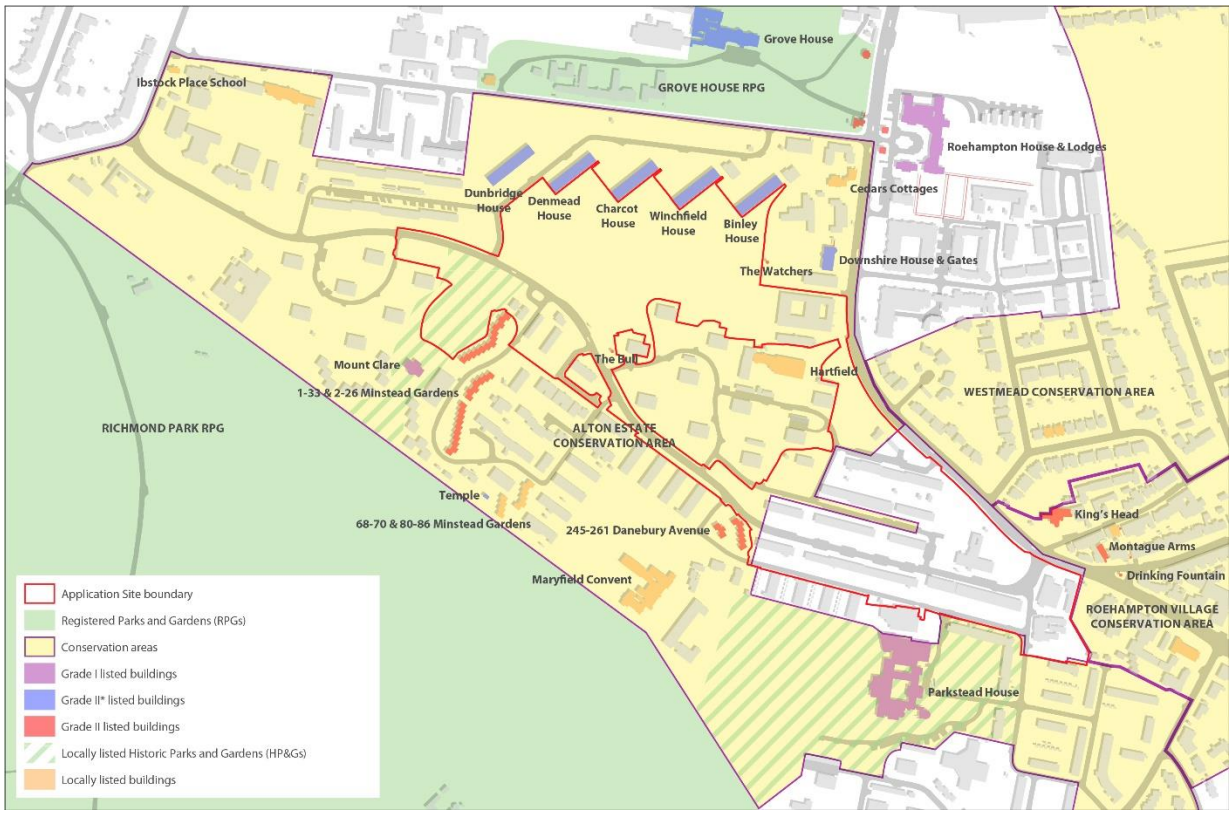

Figure 7-4: Heritage Asset Plan

Alton Conservation Area

7.61 Much of the Site lies within the Alton Conservation Area, which was designated in March 2001 and encompasses 58.1 hectares in two main parts: Alton East (1952-55) and Alton West (1955-59). The conservation area is described and its significance appraised in the Alton Conservation Area Appraisal & Management Strategy (2010)[xiv]. The conservation area has more statutorily-listed buildings than any other conservation area in the borough, some of them of high inherent sensitivity. In our view, however, the sensitivity of the conservation area when taken as a whole does not reach the same high level as some of the highly-graded individual listed buildings within it. This is partly since there are some areas of lesser value than others, and also partly due to the lack of completeness of the conservation area in representing the whole estate, as the original designed community focus for the whole estate along Danebury Avenue has been wholly excluded from the conservation area – presumably as it was regarded as being of insufficient quality. In accordance with Table 1 of Appendix 7.1, the conservation area is considered to be of moderate sensitivity. It is worth noting that the heart of the estate was excluded from the conservation area as its buildings are of very variable quality when compared to the listed estate buildings within the area.

Richmond Park Registered Park & Garden

7.62 To the south west of the Site lies the Richmond Park Registered Park & Garden (RPG), designated in October 1987 at Grade I (list entry no. 1000828). In accordance with Table 1 of Appendix 7.1, it is of high sensitivity.

Grove House Registered Park & Garden

7.63 To the north of the Site lies the Grove House Registered Park & Garden (RPG), designated in March 1990 at Grade I (list entry no. 1000419). The RPG is centred on the Grade II* listed Grove House (list entry no. 1065523) and contains several further statutorily-listed structures. In accordance with Table 1 of Appendix 7.1, the RPG is of high sensitivity.

Roehampton Village Conservation Area

7.64 Roehampton Village Conservation Area, to the east of the Site, was designated in July 1969 and extended to include properties on the southern side of Roehampton Lane in October 1984. Its focus is the core of the old village of Roehampton centred on Roehampton High Street. In accordance with Table 1 of Appendix 7.1, the Roehampton Village Conservation Area is of moderate sensitivity.

Westmead Conservation Area

7.65 Westmead Conservation Area, to the east of the Site, was designated in May 1989, and encompasses three distinct phases of suburban development that occurred on land belonging to the estates of Dover House, Roehampton House and Spencer Lodge. In accordance with Table 1 of Appendix 7.1, the Westmead Conservation Area is of moderate sensitivity.

King's Head public house, Roehampton High Street

7.66 The King's Head public house, to the east of the Site, dates from at least the 1670s, but was most likely to have originated as a farmhouse in the medieval period. The building was statutorily listed at Grade II in July 1955 (list entry no. 1300007), and, in accordance with Table 1 of Appendix 7.1, is of moderate sensitivity.

Montague Arms public house, Medfield Street

7.67 The Montague Arms public house, to the east of the Site, is described in its list description as an altered 17th century building, although the Roehampton Village Conservation Area

Appraisal describes it as a mid-18th century cottage that was turned into a beer shop in the 1860s. The building was statutorily listed at Grade II in April 1983 (list entry no. 1184425), and, in accordance with Table 1 of Appendix 7.1, is of moderate sensitivity.

Roehampton House, Lodges and Gates, Roehampton Lane

7.68 Roehampton House, to the north east of the Site, was built in 1710-12 for the merchant Thomas Cary by Thomas Archer (1668-1743). In 1910, it was acquired by Arthur Morton Grenfell, who commissioned the architect Edwin Lutyens (1869-1944) to design enormous new wings to the north and south. In 1957, a new main entrance gate on Roehampton Lane was constructed opposite the main entrance.

7.69 Roehampton House was statutorily listed at Grade I in October 1978 (list entry no. 1357694). In accordance with Table 1 of Appendix 7.1, it is of high sensitivity. The entrance gates and lodges were listed at Grade II at the same time (1357695) and are of moderate sensitivity.

Parkstead House, Roehampton High Street

7.70 Parkstead House, to the south east of the Site, was erected in the 1760s for the 2nd Earl of Bessborough, William Ponsonby (1704-1793), replacing an earlier house on the same site or close to it. The new house was designed by William Chambers (1723-1796). In 1860, it was sold to the Society of Jesus for use as a Novitiate and retreat for Ignatian spirituality. The Jesuits extended Chambers' house with new wings designed by Henry Clutton (1819-1893) and Frederick Arthur Walters (1849-1931), and a chapel begun by Joseph John Scoles (1798-1863) and completed by Samuel Joseph Nicholl (1826-1905). The eastern side of the courtyard was closed off with a four-storey neo-Georgian block in the 1950s. This was replaced with the present entrance wing in 2004-5. The present chapel at the building's south-eastern corner, the large extension around a second courtyard to the north, and the free-standing blocks fronting Holybourne Avenue and Laverstoke Gardens were also built at this time. These works were all designed by Sheppard Robson Architects.

7.71 Parkstead House was statutorily listed at Grade I in July 1955 (list entry no. 1357675). In accordance with Table 1 of Appendix 7.1, it is of high sensitivity.

Mount Clare, Minstead Gardens

7.72 Mount Clare was built between 1770 and 1773 by George Clive (d.1779), probably to designs. by Robert Taylor (1714-1788). The grounds were landscaped by Lancelot 'Capability' Brown (1715/16-1783). The present portico was added in c.1780, and by 1849 the house had been

extended to the east, linking it up with the formerly detached service block. In the early years of the 20th century, this service block was replaced with a new north-south aligned wing. The Mount Clare estate was acquired by the LCC in the 1950s for the construction of the Alton West estate. The eastern extensions were demolished in c.1962, and the building converted to a hall of residence for Garnett College. Further halls of residence were erected in the grounds to the west and south of the house, and a new teaching block was erected to the south east.

7.73 Mount Clare was statutorily listed at Grade I in July 1955 (list entry no. 1184436). In accordance with Table 1 of Appendix 7.1, it is of high sensitivity.

Temple in the grounds of Mount Clare, Minstead Gardens

7.74 The Greek Doric style 'Temple of Honour', just to the west of the present Nos. 80-86 Minstead Gardens, was relocated to its present site – then part of the Mount Clare estate – from the grounds of Parkstead House in 1913. It is thought to date from c.1762-69 and may have been designed by Sir William Chambers (1723-1796).

7.75 The Temple was statutorily listed at Grade II* in June 1955 (list entry no. 1065545), and, in accordance with Table 1 of Appendix 7.1, is of high sensitivity.

Downshire House & Gates

7.76 Parts of the present Downshire House are thought to have been built in about 1770. In 1948, the LCC compulsorily purchased the Downshire House estate, and erected the five slab blocks of the Alton West estate on the land to the west. In the early 1960s, Downshire House became the administrative centre of Garnett College, and it was linked to a large new teaching block (No. 166 Roehampton Lane) by a covered walkway. In 2004, Downshire House was acquired by the University of Roehampton. Between 2012 and 2016, the University developed three new student residence buildings – 'Chadwick Hall' – in its grounds.

7.77 Downshire House was statutorily listed at Grade II* in July 1955 (list entry no. 1065522). In accordance with Table 1 of Appendix 7.1, it is of high sensitivity. The wrought-iron gates to the north were not separately listed until April 1983 (Grade II, list entry no. 1184718). They are of moderate sensitivity.

Drinking Fountain, Roehampton Lane

7.78 The drinking fountain at the junction of Roehampton Lane and Medfield Street was designed by the architect J. C. Radford and erected in 1882. It was statutorily listed at Grade II in April 1983 (list entry no. 1065484), and, in accordance with Table 1 of Appendix 7.1, is of moderate sensitivity.

Highcliffe Drive slab blocks

7.79 Binley, Winchfield, Durbridge, Charcot and Denmead Houses – key elements of the Alton West estate – were designed in 1952-53 and constructed in 1955-58 on land that historically formed part of the estate belonging to a house named Cedar Court, but which since the early 20th century had belonged to Downshire House.

7.80 The slab blocks were statutorily listed at Grade II* in December 1998 (list entry nos. 1246040, 1246041, 1246042, 1246043 & 1246044). In accordance with Table 1 of Appendix 7.1, they are of high sensitivity.

Alton West bungalows: Nos. 1-13, 2036 & 15-33 Minstead Gardens

7.81 Nos. 1-13, 2-36 & 15-33 Minstead Gardens were designed in 1953-53 and constructed in 1957-58 on land that historically formed part of the Mount Clare estate.

7.82 The bungalows were statutorily listed at Grade II in December 1998 (list entry nos. 1246046, 1246045 & 1246017). In accordance with Table 1 of Appendix 7.1, they are of moderate sensitivity.

Alton West bungalows: Nos. 245-255 & 257-261 Danebury Avenue

7.83 Nos. 245-255 & 257-261 Danebury Avenue are of the same design as those at Nos. 1-13, 2-36 & 15-33 Minstead Gardens, and Nos. 68-70 & 80-86 Minstead Gardens. They occupy land that previously belonged to Roehampton Court (now Maryfield Convent).

7.84 Nos. 245-255 & 257-261 Danebury Avenue were statutorily listed at Grade II in December 1998 (list entry nos. 1246018 & 1246019). In accordance with Table 1 of Appendix 7.1, they are of moderate sensitivity.

The Bull

7.85 The Bull, a bronze sculpture of 1961 by Robert Clatworthy (1928-2015), was commissioned by the LCC at the behest of A. W. Cleeve Barr, one of the principal architects of the Alton East estate. It was statutorily listed at Grade II in April 1998 (list entry nos. 1376742). In accordance with Table 1 of Appendix 7.1, it is of moderate sensitivity.

The Watchers

7.86 The Watchers, a bronze sculpture of 1960 by Lynn Chadwick (1914-2003), was sited at Roehampton in 1963 by the LCC. It was statutorily listed at Grade II in April 1998 (list entry no. 1031600). In accordance with Table 1 of Appendix 7.1, it is of moderate sensitivity.

Mount Clare Historic Park & Garden (HP&G)

7.87 As discussed above, Mount Clare was built between 1770 and 1773 by George Clive (d.1779). The land immediately north and south of the house is understood to have been landscaped for Clive by the leading landscape designer of the day Lancelot 'Capability' Broen (1715/16-1783).

7.88 The Mount Clare estate was acquired by the LCC in the 1950s for the construction of the Roehampton Lane estate (later re-named Alton West). The present Nos. 2-26 Minstead Gardens were built on the south-eastern side of the former paddock. Nos. 1-13 stand on the site of shrubberies and perhaps the drying ground, whilst Nos. 15-33 occupy the eastern side of the rear lawn/meadow land. In c.1962, Mount Clare was converted to a hall of residence for Garnett College. Further halls of residence, arranged over two storeys, were erected in the grounds to the west and south of the house, and a new teaching block was erected to the south east.

7.89 Mount Clare's gardens were identified as an Historic Park and Garden (HP&G) and added to the Local List in June 2018. In accordance with Table 1 of Appendix 7.1, the HP&G is of low sensitivity.

Cedars Cottages, Roehampton Lane

7.90 Cedars Cottages are believed to have been the brewhouse and washhouse belonging to Cedar Court, which dated from the early 18th century and which was demolished in around 1913. They were added to Wandsworth's Local List of Buildings of Architectural or Historic Interest

in November 2010, and, in accordance with Table 1 of Appendix 7.1, they are of low sensitivity.

Nos. 24 & 26 Roehampton High Street

7.91 Nos. 24 & 26 Roehampton High Street look to date from the late 18th or early 19th century, although it is somewhat difficult to identify the houses with certainty on historic maps before the Ordnance Survey map of 1871 (surveyed in 1867). They are known to have undergone considerable alteration since 1969.

7.92 Nos. 24 & 26 Roehampton High Street are on the Local List of Buildings of Architectural or Historic Interest, although the date on which they were added is not given. In accordance with Table 1 of Appendix 7.1, they are of low sensitivity.

Hartfield, Roehampton Lane

7.93 Hartfield was constructed between 1894 and 1900 on the site of the kitchen garden that previously belonged to Downshire House. It has recently been extensively refurbished as the Mosaic Jewish Primary School, and new classrooms have been erected in the grounds. It was added to Wandsworth's Local List of Buildings of Architectural or Historic Interest in November 2010, and in accordance with Table 1 of Appendix 7.1, is of low sensitivity.

Nos. 5 & 7 Rodway Road

7.94 Rodway Road was developed in the early 1900s, and the last of its houses were built by 1915. The road was developed on part of the Spencer Lodge Estate, which itself was carved out of the farmland formerly associated with Roehampton House.

7.95 Nos. 5 & 7 Rodway Road were added to the Local List of Buildings of Architectural of Historic Interest in June 2018. In accordance with Table 1 of Appendix 7.1, they are of low sensitivity.

Ibstock Place School, Clarence Lane

7.96 Ibstock Place School, originally known as St Serf's, was built speculatively in the years immediately preceding the First World War. It was designed by the architect Frank Sidney Chesterton (1876-1916), who, in 1913, was brought back to extend it for Millicent Leveson-Gower (1867-1955), the Duchess of Sutherland. Following WW2, the house was acquired by the Froebel Educational Institute to re-house their demonstration school. The house has

undergone numerous phases of expansion and remodelling, and numerous new buildings have been built in its grounds.

7.97 Ibstock Place School was added to Wandsworth's Local List of Buildings of Architectural or Historic Interest in November 2010. In accordance with Table 1 of Appendix 7.1, it is of low sensitivity.

Maryfield Convent, Laverstoke Gardens

7.98 Maryfield Convent was built in 1913-14 as a private house named Roehampton Court. It was designed by Frank Sidney Chesterton (1876-1916). In 1927, it was acquired by The Poor Servants of The Mother of God, and re-named Maryfield Convent. Over the following decades, it was substantially extended to the south east, with a large chapel (1939) probably designed by Scoles & Raymond, and new kitchens, refectory and laundry (between 1939 and 1952) designed by Stewart, Hendry & Smith. In the 1950s, the north-eastern part of the convent's grounds was acquired by the LCC for the development of the Alton West estate. The convent's entrance was moved to the junction of two new streets, Laverstoke Gardens and Mount Angelus Road, whilst the straight east-west section of its original tree-lined avenue was developed as the present Harbridge Avenue.

7.99 Maryfield Convent was added to Wandsworth's Local List of Buildings of Architectural or Historic Interest in November 2010. In accordance with Table 1 of Appendix 7.1, it is of low sensitivity.

Alton West bungalows: Nos. 68-70 & 80-86 Minstead Gardens

7.100 Nos. 68-70 & 80-86 Minstead Gardens are of the same design as the listed examples at Nos. 1-13, 2-36 & 15-33 Minstead Gardens and at Nos. 245-255 & 257-261 Danebury Avenue. They were constructed in 1957-58 on previously undeveloped land that was historically part of the Mount Clare estate.

7.101 The bungalows were added to Wandsworth's Local List of Buildings of Architectural or Historic Interest in November 2010. In accordance with Table 1 of Appendix 7.1, the sensitivity of the bungalows is low, although given that they form a key element of the Alton West estate, and are of identical design to the statutorily-listed examples, they might actually be considered to be of moderate sensitivity.

Design / Strategy

7.102 The design of the Development has evolved as part of an iterative process and has been informed by the findings of the baseline heritage, townscape and visual amenity conditions. Consideration of the above baseline conditions has informed the proposed layout within the Site, the scale and massing of introduced built elements, and the extent and arrangement of different landscape treatments. A series of objectives for the landscape treatment of the Site arise from an analysis of the landscape, townscape and visual opportunities and constraints of the Site and the nine strategic objectives of the Roehampton SPD.

7.103 The landscape strategy combines the following aims:

- To integrate the Development within the landscape so as to minimise adverse landscape, visual and built heritage effects;
- To provide an attractive setting to the Development based upon the character and an understanding of the Site and surrounding environment;
- To protect and enhance the naturalistic landscape setting of the Alton Conservation Area and the listed buildings within it, particularly through the retention of the vast majority of the parkland trees on Downshire Field;
- To respond to the landscape strategy management guidelines set out in published characterisation assessments;
- To deliver the strategic landscape and design objectives of the Roehampton SPD (4 – Placemaking; 5 – High-Quality Buildings; 7 – Attractive Streets; 8 – Enhanced Open Spaces; and 9 – Setting of Heritage Assets).

7.104 Key mitigation measures that have been embedded within the design of the Development as part of an iterative process and are included within the Design Codes, Parameter Plans and the detailed design drawings submitted as part of the planning application, are:

- Provision of hard and soft landscape works, including protecting and enhancing Downshire Field, the provision of new play facilities and public realm improvements, and replacement of trees to ensure that the introduced built forms are set within a robust and coherent landscape framework;
- The removal of trees on Downshire Field only where necessary, to maintain its parkland character;
- Connecting to and integrating with the wider green infrastructure network and maintaining vistas across the Downshire Field to invoke a sense of time depth and to also respect existing desire lines to enhance the permeability of the Site;

- Incorporating a new local centre and Village Square at the eastern end of the Site to help integrate the Development into the townscape and to enhance the accessibility and inclusivity of Roehampton as a whole, while also acting as a gateway to the Site and helping to signify the centre of Roehampton, and simultaneously maintaining a second local centre at Portswood Place, which is linked to Roehampton via Danebury Avenue;
- Creation of a predominantly residential neighbourhood, with commercial floorspace and community floorspace provided to help animate the streetscene;
- Ensuring that the arrangement and layout of building plots creates a clear and legible street network that assists in permeability and wayfinding, with the amenity spaces between plot boundaries of an appropriate proportion to the vertical scale of the introduced built form, complemented by easily understood and unified building lines;
- Applying materiality that is transitional in nature across the Site, helping to provide a sensitive link between the differing typologies both within and surrounding the Site, while also providing visual interest and a finer grain of detail at ground floor levels to ensure that the built forms appear to be of human scale; and
- The vertical parameters of plot building heights which are defined to provide visual interest in the skyline and to assist in legibility and wayfinding. Meanwhile horizontal minimum and maximum continuous frontages are defined to ensure that the overall massing and scale of the built form is sympathetic to its surroundings and helps to minimize the perception of visual bulk.

7.105 The design strategy assumes that the Development is brought forward on the basis of the principles as set out above. Any planting proposals and their ongoing maintenance, management and future growth, is considered as further mitigation measures and form the basis of the assessment of residual heritage, townscape and visual effects of the Development during the Operational Phase at Year 15. The Landscape Masterplan (submitted with the planning application and as shown in Figure 3.8) demonstrates the way in which these principles can be delivered and managed.

Likely Significant Effects

7.106 In this section an assessment of the heritage, townscape and visual effects of the Development has been undertaken during the construction phase, at Year 1 of operation (based on Parameter Plans and the detailed design drawings submitted in support of the planning application, and at Year 15 of operation (based on the Masterplan submitted with the planning application and as shown in Figure 3.8), taking into account the ongoing establishment of planting proposals in accordance with the landscape strategy and as per the methodology approach set out in Appendix 7.1 and 7.3. Significant effects only are reported

in this section, while Appendix 7.5, Appendix 7.6 and Appendix 7.7 outline other non-significant effects.

Construction Phase

7.107 The principal activities that will have an effect upon heritage assets and their settings, townscape character, and views and visual amenity during the construction phase include:

- The demolition of the existing buildings within the Site and removal of existing trees and vegetation;
- The introduction of new temporary elements, including material stockpiles, welfare facilities, plant and machinery (including drilling/pilling equipment and tall cranes), and lighting;
- The movement of plant and machinery within the Site and the surrounding townscape, including crane activities; and
- The building and emergence of new built forms, consisting of 16 blocks arranged around areas of public realm (incorporating highways and playscape).

7.108 The construction phase is anticipated to take approximately 10 years in 4 distinct phases, with completion of the Development expected in 2029 (refer to chapter 5: Construction Methodology).

Heritage Effects

7.109 There will be no significant effects (i.e. those of 'Moderate' or 'Major' significance) on Built Heritage receptors during the construction phase. This is predominantly because most aspects of the Development do not entail direct (i.e. physical) impacts upon designated heritage assets. The only Built Heritage receptor that will be directly affected by the Development will be the Alton Conservation Area, the boundary of which takes in much of the Application Site. As discussed further at Appendix 7.5, overall the activity associated with the demolition of several buildings within the conservation area, and the construction of the new buildings, will have a direct, temporary effect on the Alton Conservation Area of minor adverse significance. Most impacts on heritage assets from the Development are indirect, affecting parts of their settings rather than their fabric, and thus give rise to lower magnitudes of change to the assets' sensitivity than if they were direct impacts. The settings of all the identified heritage assets accounts for only a proportion of their overall sensitivity. Thus, whilst the settings of some heritage assets will undergo considerable change, it does not follow that the impact on their sensitivity will be of 'Major' or 'Moderate' magnitude. Non-significant effects are

discussed at Appendix 7.5. It is considered that, during the construction phase, there will be indirect, temporary effects of minor adverse significance in respect of: the Richmond Park RPG; the Alton Conservation Area; the Roehampton Village Conservation Area; the Westmead Conservation Area; the King's Head public house; the Montague Arms public house; Parkstead House; Mount Clare; Downshire House; the Drinking Fountain; the Highcliffe Drive slab blocks; the bungalows at Nos. 1-13, 2-16 & 15-33 Minstead Gardens and Nos. 245-255 & 257-261 Danebury Avenue; The Bull; The Watchers; the Mount Clare HP&G; Nos. 24 & 26 Roehampton High Street; Hartfield; and Nos. 5 & 7 Rodway Road.

Townscape Effects

7.110 The construction phase will undoubtedly result in alterations to the townscape, some of which will be temporary (i.e. the introduction of plant and machinery and associated activities), while some will be longer term and also apparent during the operational phase (i.e. the emergence of built form). Appendix 7.6 outlines the townscape effects that will occur during the construction phase of the Development, as does Table 7.1.

7.111 Undoubtedly the introduction of plant and machinery, material stockpiles, welfare facilities, and construction traffic to facilitate the construction of the Development will result in a direct impact to the TCA within which the majority of the Site lies: TCA 4 – Alton West. The presence of these elements in the townscape will alter the key characteristics of the majority of the TCA for a prolonged duration, leading to a sense of instability and fragmentation in the townscape and increased incidences of visual clutter. A Large magnitude of effect will be experienced, which combined with the Medium sensitivity of the TCA, will result in a Moderate Adverse significance of effect.

7.112 For the remaining TCAs identified, while the construction activities may be temporarily perceived in the setting of the respective areas, the presence of such ongoing works will not amount to altering their key characteristics and accordingly significant effects have not been identified for these remaining TCAs.

Table 7.1: Townscape Effects - Construction Phase

Townscape Receptor				Townscape Effects – Construction Phase		
Area	**Value**	**Susceptibility**	**Sensitivity**	**Magnitude of Effect**	**Significance of Effect**	**Notes**
TCA 1: Richmond Park & Golf Course	High	Medium	High	Small	Minor Adverse	Although the construction activities associated with the Development will not occur directly within this TCA, the temporarily introduced tall plant and machinery (including cranes) will be perceived as an incongruous alteration in its setting, particularly in those elevated areas where expansive views are a defining characteristic of the area. These elements will be perceived as incongruous and intrusive features that partially erode the setting to this TCA. However, from much of the TCA the construction works will not be perceived due to the enclosure afforded by dense woodland. Nonetheless, there will be a reduction in the sense of tranquillity due to the presence of construction activities in the setting to this TCA.
TCA 2: Roehampton Suburbs	Medium	Medium	Medium	None	Neutral	Considering the distance from the Site (over 300m at its closest point), the orientation of the streetscape, and the presence of intervening built forms and vegetation, the construction activities will not be readily perceptible from this TCA. There will be no alteration to any of the key characteristics of the TCA.
TCA 3: Roehampton North	Medium	High	Medium	None	Neutral	Given the enclosed nature of this TCA due to the extent of vegetation and the distance from the Site, the construction activities will not be readily perceptible from the vast majority of the TCA, with the ongoing works only perceived from exceptionally isolated areas, and in these locations tall elements in the skyline are a defining characteristic. In light of the above there will be no alteration to any of the key characteristics of the TCA.
TCA 4: Alton West	Medium	Medium	Medium	Large	Moderate Adverse	Undoubtedly the introduction of plant and machinery, material stockpiles, welfare facilities, and construction traffic to facilitate the construction of the Development will result in a direct impact to this TCA. The presence of these elements in the townscape will alter the key characteristics of the majority of the TCA for a prolonged duration, leading to a sense of instability and fragmentation in the townscape and increased incidences of visual clutter.
TCA 5: Acton Gardens	Medium	Low	Low	Medium	Minor Adverse	Although the majority of the construction activities will not occur directly within this TCA, plant and machinery (including cranes) will be clearly perceptible from large parts of the townscape, with those works associated with the construction of buildings along Danebury Avenue most apparent. In addition, the work associated with the construction of Portswood Place will result in direct impacts to this TCA for a temporary period, with the introduced plant and machinery bring a sense of instability into the townscape, with these constituent elements appearing intrusive in the townscape.
TCA 6: Alton East	Medium	Low	Low	Medium	Minor Adverse	Although construction activities will not occur directly within this TCA, tall plant and machinery (including cranes) will be clearly perceptible from parts of the townscape, and in particular from the north-western parts of the TCA. The introduced tall plant and machinery (including cranes) will be perceived as an incongruous alteration in the setting of this TCA for a prolonged period, thus leading to a sense of instability and fragmentation in the townscape.
TCA 7: Queen Mary's Place	Medium	Low	Medium	Small	Minor Adverse	Although construction activities will not occur directly within this TCA, tall plant and machinery (including cranes), principally associated with the construction of Block Q, will be clearly perceptible from parts of the townscape. In addition, the ground level works within the north-eastern part of the Site will be perceived from the western parts of this TCA and they will be intrusive elements in the setting of this TCA, discordant with the locality. Tall plant and machinery associated with the works in the south-eastern parts of the Site will also be perceived from the TCA, meaning that the construction activities will form part of the experience to the setting of this TCA for a prolonged period.
TCA 8: Roehampton East	Medium	Medium	Medium	Medium	Minor Adverse	Although construction activities will not occur directly within this TCA, plant and machinery (including cranes) will be clearly perceptible from large parts of the townscape where the streetscape is orientated towards the Site. The introduced tall plant and machinery (including cranes) will be perceived as an incongruous alteration in the setting of this TCA for a prolonged period, appearing as detracting and intrusive elements, and thus leading to a sense of instability and fragmentation in the townscape.
TCA 9: Putney Heath	Medium	Medium	Medium	None	Neutral	Given the enclosed nature of this TCA due to the extent of vegetation and the distance from the Site (over 200m at its closest point), the construction activities will not be readily perceptible from the vast majority of the TCA, with the ongoing works only perceived from the western fringes, and in these locations tall elements in the skyline are a defining characteristic. In light of the above there will be no alteration to any of the key characteristics of the TCA.
TCA 10: Putney Park Residences	Medium	Low	Low	None	Neutral	Considering the distance from the Site (over 500m at its closest point), the orientation of the streetscape, and the presence of intervening built forms and vegetation, the construction activities will not be readily perceptible from this TCA. There will be no alteration to any of the key characteristics of the TCA.

Visual Effects

7.113 Visual receptors nearest to the Site are generally likely to experience the most apparent changes to their visual amenity. This is due to the short distance from the construction activities, whereby open views of the demolition and construction works are more likely to be obtained and are more likely to occupy a greater proportion of these views. Appendix 7.7 outlines the visual effects that will occur with respect to the identified receptors at the representative viewpoint locations during the construction phase of the Development. The viewpoint locations are described at Appendix 7.4: Townscape & Visual Baseline Conditions. The locations of these viewpoints (and the means by which they should be presented in visualisations) was agreed through consultation with Dan Taylor and Barry Sellers (forming part of the Strategic Developments Team serving Richmond and Wandsworth Councils) and reaffirmed through the ES Scoping Report and Opinion. Figure 7-5 illustrates the location of the representative viewpoints assessed.

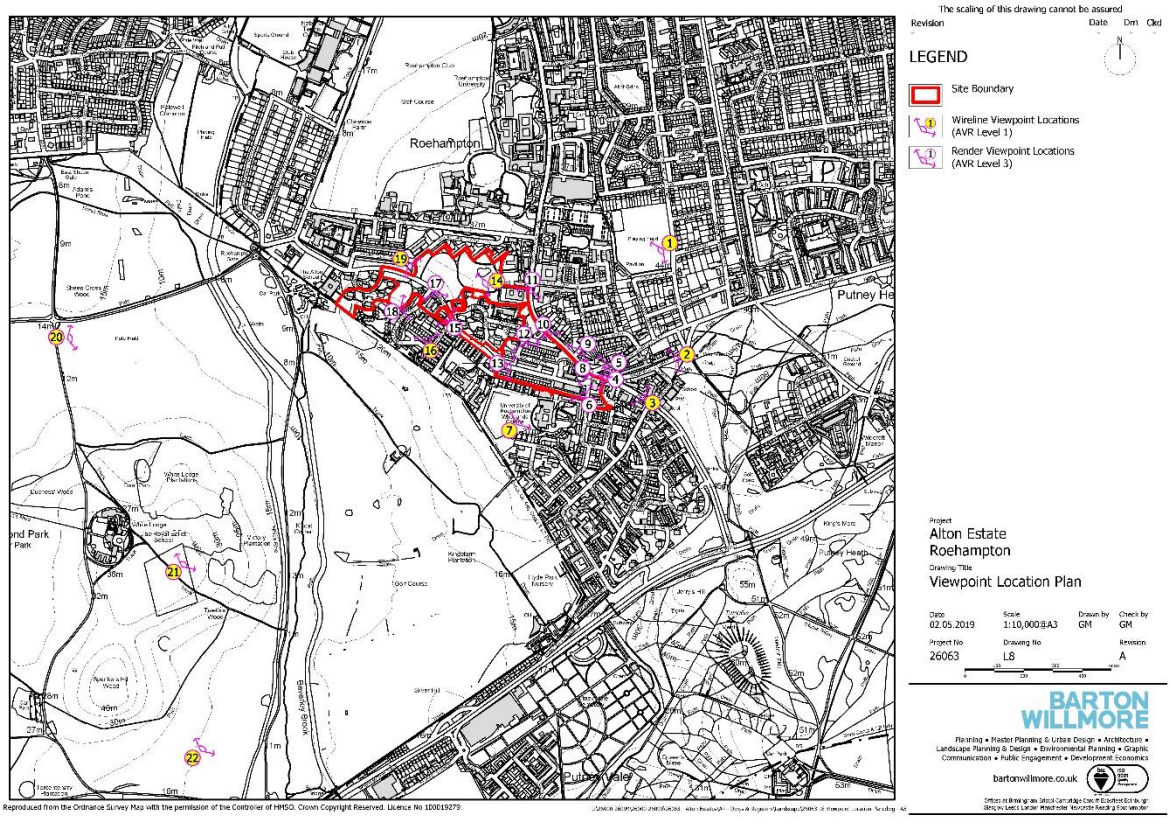

Figure 7-5: Viewpoint Location Plan

7.114 Significant visual effects will be experienced by receptors at 7 of the identified representative viewpoints during the construction phase. From the A306 Roehampton Lane near Medfield Street (Viewpoint 4), the demolition of the exiting built form within the eastern part of the Site will be immediately apparent, as will the construction of Blocks A, O and B, while ground

level works associated with the creation of the Village Green will also be immediately apparent. To a lesser extent, those works associated with the construction of Blocks C, N and M will also be visible, albeit appearing in the background of the view. In light of the above, a Large magnitude of effect will arise, which considered alongside the Low sensitivity of receptors travelling along this route, a Moderate Adverse significance of effect will occur.

7.115 In westward and southward views from the A306 Roehampton Lane (Viewpoint 8 and 10), during the construction phase the activities associated with the construction of the blocks within the eastern part of the Site will dominate the views obtained when travelling along this route as they will be in close proximity to the viewer and the introduced plant and machinery will draw the eye and erode the amenity experience, as will the loss of trees along the A306 Roehampton Lane. The plant and machinery will form the main focus of the views. In light of the above, a Large magnitude of effect will be experienced by the receptors, which coupled with their Low sensitivity, will result in a Moderate Adverse significance of effect.

7.116 From Holybourne Avenue (Viewpoint 6), the demolition and construction activities associated with the building of Blocks A and B will be clearly visible in the foreground of this view, occupying a large proportion of the view and substantially altering its composition, albeit for a temporary period. Nonetheless, the movement of plant and machinery will draw the eye and the activities will appear visually discordant, further diminishing the visual amenity experience. A Large magnitude of effect will arise, which combined with the Medium sensitivity of the receptors at this location, will result in a Moderate Adverse significance of effect.

7.117 From Ellisfield Drive (Viewpoint 12), the activities associated with the demolition of the existing built forms on Kingsclere Close and Harbridge Avenue will be immediately apparent, followed by the construction of Blocks K and H. In particular, those ground level works associated with the construction of Block K will dominate the view, leading to a diminished visual amenity experience and a pronounced change in the composition of the view. In light of the above, a Large magnitude of effect will arise, which combined with the Medium sensitivity of the receptors, will result in a Major Adverse significance of effect.

7.118 In the views east along Danebury Avenue (Viewpoint 13) there will be a pronounced change to the composition of the view on account of the demolition of the existing built form along Danebury Avenue and the introduction of plant and machinery to facilitate the construction of new buildings along its length on either side. These activities will occur over an extended duration, and in this regard a Large magnitude of effect will arise, which combined with the Medium sensitivity of receptors at this location, will result in a Moderate Adverse significance of effect.

7.119 From Downshire Field (Viewpoint 17), the demolition and construction works associated with Portswood Place will be in close proximity to the viewers and occupy a wide extent of the views obtained, with the movement of plant and machinery drawing the eye and eroding the visual amenity scene. A Large magnitude of effect will be experienced, which considered alongside the Medium sensitivity of receptors at Downshire Field, will result in a Major Adverse significance of effect.

7.120 A summary of the construction visual effects reported is provided in Table 7.2, with greater detail provided in Appendix 7.7. Representative photographs related to the agreed viewpoints are set out within the operational effects section of this ES Chapter and within Appendix 7.8.

Table 7.2: Summary of Construction Visual Effects

Visual Receptor					Visual Effects – Construction Phase		
Ref	**Name**	**Value**	**Susceptibility**	**Sensitivity**	**Magnitude of Effect**	**Significance of Effect**	**Notes**
1	View south-west from Roehampton Playing Fields	Medium	Medium	Medium	Very Small	Negligible Adverse	During the construction phase the uppermost parts of tall plant and machinery, including cranes, will be visible for a short duration in the backdrop of the view above the intervening mature vegetation and roofscape. However, on account of the substantial distance and the minimal vertical and horizontal extent of the view occupied by these temporal elements, there will be a barely perceptible change in the view during the construction phase.
2	View west from Medfield Street / edge of Putney Heath	Medium	Medium	Medium	Medium	Minor Adverse	During the construction phase the demolition of the existing built form within the eastern part of the Site will be visible, as will the construction of Blocks A, B, C and O, which will result in the presence of plant and machinery in the background of the view for a prolonged period, as these works will extend across both construction phases of the Development. The ground level activities associated with the creation of the Village Square will also be visible. The prolonged duration, in addition to the way in which the view obtained will be channelled along the streetscape towards the activities, means that there will be a noticeable change in the view during the construction phase.
3	View north-west from A306 Roehampton Lane near Ponsonby Road	Medium	Low	Low	Medium	Negligible Adverse	During the construction phase the demolition of the existing built form within the eastern part of the Site will be visible, as will the construction of Blocks O, N, K and M, which will result in the presence of plant and machinery in the background of the view for a temporary period. As Block O beings to emerge, this will also serve to partially screen the construction activities that are occurring in the view. Given the above and the way in which the view obtained is channelled along the streetscape towards the activities, the construction activities will represent a noticeable change in the view.
4	View west from A306 Roehampton Lane / Medfield Street	Medium	Low	Low	Large	Moderate Adverse	During the construction phase the demolition of the exiting built form within the eastern part of the Site will be immediately apparent, as will the construction of Blocks A, O and B, while ground level works associated with the creation of the Village Square will also be immediately apparent. To a lesser extent, those works associated with the construction of Blocks C, N and M will also be visible, albeit appearing in the background of the view. In light of the above, the construction activities will occupy a large proportion of the view for a prolonged duration, resulting in a pronounced diminishment of the visual amenity experience.
5	View south-west from Roehampton High Street	Medium	Medium	Medium	Medium	Minor Adverse	During the construction phase the demolition of the existing built form within the eastern part of the Site will be visible, as will the construction of Block O, which will result in the presence of plant and machinery in the background of the view for a temporary period. The plant and machinery will draw the viewers' eye at the end of this vista and will appear as detracting elements in the view, resulting in a noticeable change in the view during the construction phase.
6	View north-west from Holybourne Avenue	Medium	Medium	Medium	Large	Moderate Adverse	The demolition and construction activities associated with the building of Blocks A and B will be clearly visible in the foreground of this view, occupying a large proportion of the view and substantially altering its composition, albeit for a temporary period. Nonetheless, the movement of plant and machinery will draw the eye and the activities will appear visually discordant, further diminishing the visual amenity experience.
7	View north-east from Roehampton Recreation Centre	Medium	Medium	Medium	Medium	Minor Adverse	The construction of Blocks B, C, D, E F and G will be visible in the background of the view, with the plant and machinery to demolition the existing built form and construct the new buildings extending across a wide horizontal extent. However, these elements, while detracting features in the view, will be heavily screened by the vegetation that encloses the intervening playing field, and as such the disruption to the skyline will be less pronounced. Prior to the construction of the aforementioned Blocks, some of the taller plant and machinery associated with the construction of Blocks O, N and K will also be visible, meaning that the construction activities will be visible over an extended duration.
8	View west from A306 Roehampton Lane	Medium	Low	Low	Large	Moderate Adverse	During the construction phase the activities associated with the construction of Block O and the Village Square will dominate the view, being at close proximity to the viewer, with those associated with Blocks A and B visible beyond. The introduced plant and machinery will draw the eye and will erode the amenity experience.
9	View south-west from Rodway Road / Akehurst Street	Medium	Medium	Medium	Medium	Minor Adverse	During the construction phase tall plant and machinery, including cranes, will be clearly visible in the background of the view associated with Block N at the end of the road, while those associated with Block K will also be visible at an oblique angle to the right, partially filtered by the intervening vegetation. The features will draw the eye and appear visually discordant, resulting in a noticeable alteration to the view.
10	View south-east from A306 Roehampton Lane	Medium	Low	Low	Large	Moderate Adverse	During the construction phase the plant and machinery associated with the demolition and construction of Blocks M, K, N and O will be visible from this location. In particular, those associated with M and K will appear prominent in the view, while the movement of cranes in the background associated with N and O will also draw the eye. Given the wide extent of the view occupied by construction works for an extended duration there will be a pronounced change in the view.
11	View south from A306 Roehampton Lane / Holford Way	Medium	Low	Low	Medium	Minor Adverse	The demolition of 166 Roehampton Lane and the construction of Block Q will form the main focus of the views obtained from this location, in the middle ground, although works associated with Block M will also be visible, with the tall plant and machinery visible in the background. On balance, a noticeable change in the view is to be experienced.
12	View south from Ellisfield Drive	Medium	Medium	Medium	Large	Major Adverse	During the construction phase the activities associated with the demolition of the existing built forms on Kingsclere Close and Harbridge Avenue will be immediately apparent, followed by the construction of Blocks K and H. In particular those ground level works associated with the construction of Block K will dominate the view, leading to a diminished visual amenity experience and a pronounced change in the composition of the view.
13	View east along Danebury Avenue	Medium	Medium	Medium	Large	Moderate Adverse	During the construction phase there will be a pronounced change to the composition of the view on account of the demolition of the existing built form along Danebury Avenue and the introduction of plant and machinery to facilitate the construction of new buildings along its length on either side. These activities will occur over an extended duration.
14	View south-west across Downshire Field	Medium	Medium	Medium	Very Small	Negligible Adverse	The majority of the construction activities will be screened from view by the intervening tree vegetation, including those associated with demolition and construction of the Portswood Place local centre. Towards the latter part of the

Visual Receptor					Visual Effects – Construction Phase		
Ref	**Name**	**Value**	**Susceptibility**	**Sensitivity**	**Magnitude of Effect**	**Significance of Effect**	**Notes**
							construction period, those works associated with the removal of trees within Downshire Field will be visible, albeit for a very short duration, as will the works associated with the newly created playspace in the foreground of the view.
15	View north-west from Danebury Avenue	Medium	Medium	Medium	Very Small	Negligible Adverse	During the construction phase tall plant and machinery associated with the demolition of existing built forms and the construction of the Portswood Place local centre will be visible in the backdrop of this view (in this direction), albeit heavily screened and/or filtered by the intervening built form and vegetation.
16	View west from Swanwick Close / Minstead Gardens	Medium	Medium	Medium	Very Small	Negligible Adverse	During the construction phase the uppermost parts of tall plant and machinery will be visible for a short duration in the backdrop of the view above the intervening built forms. Similarly, infrequent passing construction traffic will be visible peripheral to the viewer when travelling along Danebury Avenue. However, on account of the minimal vertical and horizontal extent of the view occupied by these temporal elements, there will be a barely perceptible change in the view during the construction phase.
17	View south from Downshire Field	Medium	Medium	Medium	Large	Major Adverse	The demolition and construction works associated with Portswood Place will be in close proximity to the viewers and occupy a wide extent of the view, with the movement of plant and machinery drawing the eye and eroding the visual amenity scene.
18	View north-east from Mount Clare	Medium	Medium	Medium	Medium	Minor Adverse	During the construction phase, plant and machinery will be visible across three constituent parts of the view, including the tall plant and machinery associated with Block Q and G, in addition to those associated with Portswood Place in the centre of the view. As a result a wide extent of the view will be altered incrementally over a prolonged period, intensifying the detracting nature of the construction works.
19	View south-east from Sherfield Gardens / Highcliffe Drive	Medium	Medium	Medium	Small	Negligible Adverse	Plant and machinery will be visible in the background of the view during the construction phase, although they will be heavily filtered and screened by the intervening tree vegetation such that they will be an unobtrusive change in the view.
20	View east from Richmond Park, west of Roehampton Gate	Medium	High	High	Small	Minor Adverse	During the construction phase tall plant and machinery will be visible in the backdrop of the view above the intervening treed skyline. Tall elements, such as cranes will be seen to incrementally advance across the skyline for a prolonged duration, appearing alongside the tall Point Blocks that punctuate the skyline. All ground level activities will be screened from view. In light of the above and the substantial distance of receptors form the works, the visibility of these activities will represent an unobtrusive change, with the main focus still drawn towards the expansive open space.
21	View north-east from Richmond Park near White Lodge	Medium	High	High	Small	Minor Adverse	During the construction phase tall plant and machinery will be visible in the backdrop of the view above the intervening treed skyline. Tall elements, such as cranes will be seen to incrementally advance across the skyline for a prolonged duration, appearing alongside the tall Point Blocks that punctuate the skyline. All ground level activities will be screened from view. In light of the above and the substantial distance of receptors form the works, the visibility of these activities will represent an unobtrusive change, with the main focus still drawn towards the expansive open space.
22	View north from Richmond Park near Spankers Hill Wood	Medium	High	High	Small	Minor Adverse	During the construction phase tall plant and machinery will be visible in the backdrop of the view above the intervening treed skyline. Tall elements, such as cranes will be seen to incrementally advance across the skyline for a prolonged duration, appearing alongside the tall Point Blocks that punctuate the skyline. All ground level activities will be screened from view. In light of the above and the substantial distance of receptors form the works, the visibility of these activities will represent an unobtrusive change, with the main focus still drawn towards the expansive open space.

Operational Phase – Year 1

7.121 The description of the Development is provided in Chapter 3 (Site Development & Description) of the ES. The principal elements that will have an effect upon heritage, townscape and visual amenity during the Operational Phase – Year 1 include:

- The introduction of 21 new residential buildings that either stand singularly, or are linked by shared podiums, with the podiums occupied by commercial/office space, car parking, cycle stores and service areas; and
- The introduction of new areas of public realm (including planting, playspace and hardscaping) and amenity space (including the Village Square and the above the aforementioned podiums).

7.122 Appendix 7.8 demonstrates the appearance of the Development in the form of verifiable views and is supported by a robust methodology. For clarity, and as agreed through the EIA scoping process, with 'near-distance' views depicted as rendered images, and those further afield as wirelines. Within those rendered images, the detailed aspects of the Development are illustrated utilising a textured model to create an impression of what the detailing and materiality of the built form and structures will look like (i.e. to AVR Level 3), while the outline elements of the Development are illustrated by way of clay block models solely incorporating embedded design aspects secured through design codes (i.e. to AVR Level 2). For the avoidance of doubt, the outline elements of the Development are not shown with a textured model, minute detailing or materiality, and accordingly their appearance is likely to differ than as depicted in the images, with the exception of their overall bulk, scale and mass.

Heritage Effects

7.123 Despite the scale and extent of the Development, there will be no significant effects (i.e. those of 'Moderate' or 'Major' significance) on Built Heritage receptors during the Operational Phase. This is predominantly because most aspects of the Development do not entail direct (i.e. physical) impacts upon designated heritage assets. The only Built Heritage receptor that will be directly affected by the Development will be the Alton Conservation Area, the boundary of which takes in much of the Application Site. As discussed further at Appendix 7.5, due to the considered massing and high design quality of the proposed new buildings and landscaping works, it is considered that there will be a direct, permanent effect on the Alton Conservation Area of minor beneficial significance. Most impacts on heritage assets from the Development are indirect, affecting parts of their settings rather than their fabric, and thus give rise to lower magnitudes of change to the assets' sensitivity than if they were direct

impacts. As noted above, the settings of all the identified heritage assets accounts for only a proportion of their overall sensitivity. Thus, whilst the settings of some heritage assets will undergo considerable change, it does not follow that the impact on their sensitivity will be of 'Major' or 'Moderate' magnitude. As noted above, non-significant effects are discussed at Appendix 7.5. However, it is worth mentioning here that it is considered that there will be an indirect, permanent effect on the Alton Conservation Area of minor beneficial significance. There will also be indirect, permanent effects of minor beneficial significance in respect of: the Roehampton Village Conservation Area; the Westmead Conservation Area; the King's Head public house; the Montague Arms public house; Mount Clare; the Highcliffe Drive slab blocks; the bungalows at 1-13, 2-16 & 15-33 Minstead Gardens and Nos. 245-255 & 257-261 Danebury Avenue; The Watchers; the Mount Clare HP&G; Nos. 24 & 26 Roehampton High Street; and Nos. 5 & 7 Rodway Road. There will be indirect, permanent effects of minor adverse significance in respect of: the Richmond Park RPG; Parkstead House; Downshire House; and Hartfield.

Townscape Effects

7.124 Despite the scale and extent of the Development, significant townscape effects will not arise during the Operational Phase – Year 1. Appendix 7.6 outlines the townscape effects identified that will occur during this phase of the Development, as does Table 7.3.

7.125 With regards to the TCA that encompasses the majority of the Site, the introduced built form will fundamentally alter the fabric of large parts of this TCA. The new building blocks in the townscape will help to establish a strong local identity, while subtle variation in the arrangement of scale, mass, tonality and materiality will help to ensure that there is a successful balance between homogeny and visual interest, while also referencing and acknowledging the surrounding features (principally those of historic interest) in the townscape. The extent and quality of green space within the TCA will also be increased as a result of the Development, including the introduction of the Village Green and the incorporation of courtyards within the podiums of the building blocks.

Table 7.3: Townscape Effects - Operational Phase – Year 1

Townscape Receptor				Townscape Effects – Operational Phase – Year 1		
Area	**Value**	**Susceptibility**	**Sensitivity**	**Magnitude of Effect**	**Significance of Effect**	**Notes**
TCA 1: Richmond Park & Golf Course	High	Medium	High	Very Small	Negligible Beneficial	Once completed the majority of the introduced built form will not be perceived from this TCA. However, where the uppermost parts of the introduced buildings do form distinct features in the setting of this TCA, they will help to signpost the centre of Roehampton and thereby assist in wayfinding and legibility, due to the way in which they gently rise up in height towards the location of the new Village Square.
TCA 2: Roehampton Suburbs	Medium	Medium	Medium	None	Neutral	Considering the distance from the Site (over 300m at its closest point), the orientation of the streetscape, and the presence of intervening built forms and vegetation, the Development will not be readily perceptible from this TCA. There will be no alteration to any of the key characteristics of the TCA.
TCA 3: Roehampton North	Medium	High	Medium	None	Neutral	Given the enclosed nature of this TCA due to the extent of vegetation and the distance from the Site, the Development will not be readily perceptible from the vast majority of the TCA, and will only be perceived from exceptionally isolated areas, and in these locations tall elements in the skyline are a defining characteristic. In light of the above there will be no alteration to any of the key characteristics of the TCA.
TCA 4: Alton West	Medium	Medium	Medium	Large	Minor Beneficial	At Year 1, the introduced built form will fundamentally alter the fabric of the majority of this TCA. The new building blocks in the townscape will help to establish a strong local identity, while subtle variation in the arrangement of scale, mass, tonality and materiality will help to ensure that there is a successful balance between homogeny and visual interest, while also referencing and acknowledging the surrounding features (principally those of historic interest) in the townscape. The extent and quality of green space within the TCA will also be increased as a result of the Development, including the introduction of the Village Square and the incorporation of courtyards within the podiums of the building blocks.
TCA 5: Acton Gardens	Medium	Low	Low	Medium	Minor Beneficial	Once completed, the newly introduced built forms in the eastern part of the Site will noticeably enhance the setting of this TCA as they will replace built forms that are in a poor condition and of a diminished architectural quality. Similarly, the introduction of Portswood Place, consisting of a distinctive juxtaposition of concrete and timber, will reinvigorate this part of the TCA and provide a renewed sense of vitality to the area.
TCA 6: Alton East	Medium	Low	Low	Very Small	Negligible Beneficial	At Year 1 the newly introduced built forms in the eastern part of the Site will be perceived from this TCA. This will represent a beneficial change by helping to create a positive land use in the setting of this TCA. In addition, the height and massing of the proposed built forms will introduce articulation to the skyline, which will integrate with existing large-scale built forms in the adjacent surrounding townscape. From other areas of the TCA, the Development will not generally be perceived due to intervening built forms and vegetation. On balance, there will be a very slight improvement in the setting of this TCA.
TCA 7: Queen Mary's Place	Medium	Low	Medium	Very Small	Negligible Beneficial	At Year 1 the Development will be perceptible from the western fringe of the TCA, and in the context of other existing modern development and which on balance will very slightly improve the fabric of the setting to this TCA.
TCA 8: Roehampton East	Medium	Medium	Medium	Medium	Minor Beneficial	At Year 1 the newly introduced built forms in the eastern part of the Site will be perceived from this TCA. This will represent a beneficial change by helping to create a positive land use in the setting of this TCA. In addition, the height and massing of the proposed built forms will introduce articulation to the skyline, which will integrate with existing large-scale built forms in the adjacent surrounding townscape. The massing arrangement will also help to signpost the centre of Roehampton and thus assist in wayfinding and legibility, while the newly introduced buildings will be of a greater design aesthetic than those they replace. On balance, there will be a noticeable improvement in the setting of this TCA.
TCA 9: Putney Heath	Medium	Medium	Medium	None	Neutral	Given the enclosed nature of this TCA due to the extent of vegetation and the distance from the Site (over 200m at its closest point), the Development will not be readily perceptible from the vast majority of the TCA, with the buildings only perceived from the western fringes, and in these locations tall elements in the skyline are a defining characteristic. In light of the above there will be no alteration to any of the key characteristics of the TCA.
TCA 10: Putney Park Residences	Medium	Low	Low	None	Neutral	Considering the distance from the Site (over 500m at its closest point), the orientation of the streetscape, and the presence of intervening built forms and vegetation, the Development will not be readily perceptible from this TCA. There will be no alteration to any of the key characteristics of the TCA.

Visual Effects

7.126 Once built, the extent to which the introduced built form is perceived as a positive or negative contributor to the views obtained is entirely dependent on context and the visual amenity of the receptor in question. Appendix 7.7 outlines the visual effects identified that will occur during this phase of the Development. Significant visual effects will be experienced by receptors at 2 of the identified representative viewpoints at Year 1.

7.127 In the views west along the A306 Roehampton Lane (Viewpoint 4 and Viewpoint 8) the newly introduced built forms will represent a beneficial change in comparison to the existing built form that is in a poor state of repair. In particular, Blocks A and O (framed around the new Village Square) will represent a higher visual aesthetic, with Block A distinctive in its design featuring a bronzed base and lower mid-section, with the cornice of the mid-section consisting of a zig-zag profile that envelopes the entire building. Grey brickwork, punctuated by regular deep reveals and bronzed balustrades provides a sense of rhythm, while the cementitious crown appears visually recessive and softens the overall mass of the building. This attention to detail highlights the landmark function of this new building. Furthermore, the completed Village Square will form the focus of the views when travelling along this part of the A306 Roehampton Lane, with the introduced tree and shrub planting and high-quality public realm interventions enhancing the visual amenity experience.

7.128 In contrast, the wedge form of Block O helps to lead views along both Danebury Avenue and the A306 Roehampton Lane (Viewpoint 4), while the brickwork broken up by concrete banding helps create a suitable transition between the existing built form in Roehampton and the distinctive form of Block A. The concrete base helps to provide continuity across Block O, while also grounding this building and helping it integrate with the Village Square. In light of the above, a Large magnitude of effect will be experienced, which combined with the Low sensitivity of receptors travelling along this route, will result in a Moderate Beneficial significance of effect.

7.129 In the view south from Ellisfield Drive (Viewpoint 12) Block K will form the main focus of the view, with the light grey and concrete hues of the building reflecting the materiality of the nearby Point Blocks and Slab Blocks of Alton Estate, while recessed balconies and Juliet balconies featuring gold aluminium detailing will provide visual interest (including protruding bays). The recessed corners will appear to diminish the visual bulk of the building, while the strong vertical and horizontal rhythm along the façades leads the eye to wander through the townscape rather than remaining fixated on static points, and resulting in a positive visual amenity experience. The landscape treatments will serve to help soften the appearance of the introduced built forms and better integrate them into the fabric of the townscape. A Large

magnitude of effect will be experienced, which combined with the Medium sensitivity of receptors, will on balance result in a Moderate Beneficial significance of effect.

7.130 Provided within this section are representative photographs of the existing baseline conditions from each of the agreed viewpoint locations, alongside which a verifiable visualisation is provided to illustrate the visual effects that will arise and a summary of that effect. For clarity, the images contained within this ES Chapter do not conform with the Landscape Institute Guidelines on optimum viewing distance, and instead the reader should refer to Appendix 7.8 for the optimum viewing distance.

7.131 A summary of the visual effects experienced during Year 1 of the operational phase is provided in Table 7.4.

Table 7.4: Summary of Visual Effects – Operational Phase – Year 1

Visual Receptor					Visual Effects – Operational Phase – Year 1		
Ref	**Name**	**Value**	**Susceptibility**	**Sensitivity**	**Magnitude of Effect**	**Significance of Effect**	**Notes**
1	View south-west from Roehampton Playing Fields	Medium	Medium	Medium	None	Neutral	Once completed, the Development will not be visible as it will be screened from view by the intervening mature vegetation and built forms.
2	View west from Medfield Street / edge of Putney Heath	Medium	Medium	Medium	Medium	Minor Beneficial	Once completed, the newly introduced built elements will be visible in the background of the view. While being broadly comparable in scale and height to the existing built forms, the slightly greater height of Block O will help create a focal point in the background of the view which as a result will slightly help to create and define a new vista that also assists in wayfinding and legibility due to the increased height signifying a point of interest in the townscape.
3	View north-west from A306 Roehampton Lane near Ponsonby Road	Medium	Low	Low	Medium	Negligible Beneficial	Once completed, the newly introduced built elements will be visible in the background of the view, with the eastern elevations of Blocks O and K forming the main focus to the view. However the materiality and detailing of these elevations will not be appreciated on account of the distance. The scale, mass and height of the introduced built form will appear consist with the surrounding area, with the chamfered edge of Block O helping to draw the eye through the streetscape, while also helping to signpost this nodal point in the townscape through its orientation, thus assisting in wayfinding and legibility.
4	View west from A306 Roehampton Lane / Medfield Street	Medium	Low	Low	Large	Moderate Beneficial	Once completed these newly introduced built forms will represent a beneficial change in comparison to the existing built form that is in a poor state of repair. In particular, Blocks A and O (framed around the new Village Square) will represent a higher visual aesthetic, with Block A distinctive in its design featuring a bronzed base and lower mid-section, with the cornice of the mid-section consisting of a zig-zag profile that envelopes the entire building. Grey brickwork, punctuated by regular deep reveals and bronzed balustrades provides a sense of rhythm, while the cementitious crown appears visually recessive and softens the overall mass of the building. This attention to detail highlights the landmark function of this new building. In contrast, the wedge form of Block O helps to lead views along both Danebury Avenue and the A306 Roehampton Lane, while the brickwork broken up by concrete banding helps create a suitable transition between the existing built form in Roehampton and the distinctive form of Block A. The concrete base helps to provide continuity across Block O, while also grounding this building and helping it integrate with the Village Square.
5	View south-west from Roehampton High Street	Medium	Medium	Medium	Medium	Minor Beneficial	Once completed, channelled views of the Block O will be obtained, replacing views of the existing high-rise built form with one of a comparable height. However, the materiality and elevational strategy of Block O will provide a more positive visual aesthetic and will result in an improvement to the composition of the view (with a channelled view towards tall built form remaining the main characteristic), as subtle detailing such as the chamfered brickwork piers will provide variation and visual interest in the façade on the upper levels, as will the articulation (and texture in the view) provided by the patterned brickwork. These elements offset the reduction in sky visible.
6	View north-west from Holybourne Avenue	Medium	Medium	Medium	Large	Minor Beneficial	Once completed to the right of the view Block A will appear as a distinctive new landmark building, featuring a bronzed base and lower mid-section, with the cornice of the mid-section consisting of a zig-zag profile that envelopes the entire building. Grey brickwork, punctuated by regular deep reveals and bronzed balustrades provides a sense of rhythm, as does the concrete horizontal banding. Block B will also be visible in the view (part of the outline element), appearing slightly larger in scale than the existing built form and consequently resulting in increased enclosure.
7	View north-east from Roehampton Recreation Centre	Medium	Medium	Medium	Small	Negligible Beneficial	Once completed, the uppermost storeys of Blocks B, C, D, E and F will be visible from this location, and will be seen to gradually step up in height from left to right, thereby helping to signpost the centre of Roehampton and thus assisting in wayfinding and legibility. However, the overarching composition of the view will only be subtly altered owing to the extent of vegetation filtering the views, with the introduced built form effectively perceived as replacing the existing built form.
8	View west from A306 Roehampton Lane	Medium	Low	Low	Large	Moderate Beneficial	At Year 1 the completed Village Square will form the focus of the view from this location, with the introduced tree and shrub planting and high-quality public realm interventions enhancing the visual amenity experience. In addition, the newly introduced Blocks O, A and B (outline element) will complement the streetscape and will represent a beneficial change in comparison to the existing built form that is in a poor state of repair. In particular the materiality and elevational strategy of Block O will provide a positive visual aesthetic on account of the detailing and active frontage provided. On balance it will result in an improvement to the composition of the view, despite the loss of open space, as subtle detailing such as the chamfered brickwork piers will provide variation and visual interest in the façade on the upper levels, as will the articulation (and texture in the view) provided by the patterned brickwork. At ground level, the stonework will provide an alternative expression to the main body of the building and highlight the differing land use at this level. Block A will be distinctive in its design, featuring a bronzed base and lower mid-section, with the cornice of the mid-section consisting of a zig-zag profile that envelopes the entire building. Grey brickwork, punctuated by regular deep reveals and bronzed balustrades provides a sense of rhythm, while the cementitious crown appears visually recessive and softens the overall mass of the building. This attention to detail highlights the landmark function of this new building.
9	View south-west from Rodway Road / Akehurst Street	Medium	Medium	Medium	Medium	Minor Beneficial	Once completed, Block N will form the main focus to the view and will be seen as an enhancement in comparison to the existing views of the built form that is currently in a poor condition and of a diminished architectural quality. The use of warm hue bricks in one of the buildings will reflect the red brick detailing present on Rodway Road, and the use of gold aluminium frames and balustrades will similarly reflect the warmer hues. In the adjacent building in Block N,

Visual Receptor					Visual Effects – Operational Phase – Year 1		
Ref	**Name**	**Value**	**Susceptibility**	**Sensitivity**	**Magnitude of Effect**	**Significance of Effect**	**Notes**
							the lighter brickwork and metal balustrading provides a visually complementary contrast, that lightens the overall feel of the building. The deep and wide reveals of Block N in the elevation will diminish the perceived height of the building, while the drop in height towards the A306 Roehampton Lane ensures that the bulk of the Block is perceptually reduced.
10	View south-east from A306 Roehampton Lane	Medium	Low	Low	Large	Minor Beneficial	Once completed, the Development will result in additional enclosure to the view that will help to frame the streetscape and lead the eye towards the Village Square area and the church. The modulation in the height of the introduced buildings will ensure that the introduced buildings do not appear bulky, and instead provide a visually pleasing rhythm in the view that again leads the eye through the streetscape. The materiality of the built form will provide additional visual interest (with differing blocks displaying different treatments) and the protruding balconies a sense of articulation on the elevation fronting the A306 Roehampton Lane. Landscape interventions along the eastern boundary of the Site will also help to soften the appearance of the built form and further integrate these newly introduced features into the view. These positive elements offset the inherent loss of openness and extent of sky visible experienced currently, in addition to the loss of trees along this streetscape.
11	View south from A306 Roehampton Lane / Holford Way	Medium	Low	Low	Medium	Minor Beneficial	Once completed, Block M will be visible in the distance although it will not draw the eye. Instead, the focus will be towards the newly introduced Block Q, which is arranged as three distinct buildings, with two visible from this location. The 6-storey building fronting on to the A306 Roehampton Lane will feature an ordered façade that reflects the materiality of the nearby buildings (such as Downshire House and Chadwick Hall), while the wide recessed openings of the building reflect those of the nearby Point Blocks of Alton Estate. The decorative brick within recessed elements will provide a degree of fine detail and depth that results in articulation to the elevation and enhanced visual interest. On balance there will be an improvement to the composition of the view.
12	View south from Ellisfield Drive	Medium	Medium	Medium	Large	Moderate Beneficial	Once completed, Block K will form the main focus of the view, with the light grey and concrete hues of the building reflecting the materiality of the nearby Point Blocks and Slab Blocks of Alton Estate, while recessed balconies and Juliet balconies featuring gold aluminium detailing will provide visual interest (including protruding bays). The recessed corners will appear to diminish the visual bulk of the building, while the strong vertical and horizontal rhythm along the façades leads the eye to wander through the townscape rather than remaining fixated on static points, and resulting in a positive visual amenity experience. The landscape treatments will serve to help soften the appearance of the introduced built forms and better integrate them into the fabric of the townscape.
13	View east along Danebury Avenue	Medium	Medium	Medium	Large	Negligible Beneficial	Once completed, Blocks H, I J N and O will be visible to the left of Danebury Avenue, whilst Blocks G, F, E , D, C, B and A will be visible to the right, with the majority of elements visible relating to the outline aspects of the Development. The viewers eye will be led through the streetscape, with the built form framing the view and resulting in a visually pleasing composition as a result of the unified building lines. Planting proposals within the public realm will also help soften the appearance of the built form.
14	View south-west across Downshire Field	Medium	Medium	Medium	Small	Negligible Beneficial	Once operational, the newly introduced built form at Portwood Place will be screened from view, despite the slight thinning of trees within Downshire Field (opening up an historic vista). However, the newly created playspace and landscape interventions will be visible in the foreground of the view and will represent a subtle albeit beneficial alteration.
15	View north-west from Danebury Avenue	Medium	Medium	Medium	Very Small	Neutral	Once completed a small proportion of the eastern elevation of Portswood Place will be visible, as will some of the landscaping works (include hardscape elements such as the concrete sett paving in the streetscape). However, these elements will be barely appreciated due to the array of intervening features that more readily draw the eye.
16	View west from Swanwick Close / Minstead Gardens	Medium	Medium	Medium	None	Neutral	Once completed, the Development will not be visible as it will be screened from view by the intervening mature vegetation and built forms.
17	View south from Downshire Field	Medium	Medium	Medium	Medium	Minor Beneficial	Once completed, the built form of Portswood Place will form the main focus of the view. The buildings, consisting of a 'U-shape' of one and two storeys, will be of a comparable height to the exiting built form but of a greater architectural aesthetic owing to the juxtaposition between concrete and timber, punctuated by large expanses of glazing. The timber fins of the buildings will provide a strong vertical emphasis that serves to provide articulation in the façade and a sense of rhythm, while also breaking up the horizontal mass of the form. The bulk of the building is also perceptually minimized by the timber appearing to rise out in a light manner from the 'heavier' concrete base.
18	View north-east from Mount Clare	Medium	Medium	Medium	Small	Negligible Beneficial	Once completed, Portswood Place will be visible in the view. Portswood Place will appear to sit at the foot of the slope and will largely blend into the view, being of a comparable height to the existing built form. Block Q in the distance will be barely perceived through the tree vegetation and will remain subservient to the existing Point Blocks due to its reduced scale and height. Views through to Downshire Field will also be partly opened up, restoring this historic link.
19	View south-east from Sherfield Gardens / Highcliffe Drive	Medium	Medium	Medium	Very Small	Neutral	Once completed, glimpses through the vegetation towards Portswood Place and Block Q are likely to be obtained, although they will not draw the eye and will cause a barely perceptible change in the view that effectively equates to an alteration that is neither beneficial nor adverse.
20	View east from Richmond Park, west of Roehampton Gate	Medium	High	High	Very Small	Neutral	Once completed the vast majority of the introduced built form will be screened from view. Where the uppermost parts of the introduced buildings are visible they will be seen in the context of the existing high-rise point and slab blocks, and will be of a reduced scale and height to these elements, thus maintaining their subservience to these features. Views of the church spire will be unobstructed, while the main focus of the view of the expansive open space will be unaltered.

Visual Receptor					Visual Effects – Operational Phase – Year 1		
Ref	**Name**	**Value**	**Susceptibility**	**Sensitivity**	**Magnitude of Effect**	**Significance of Effect**	**Notes**
21	View north-east from Richmond Park near White Lodge	Medium	High	High	Very Small	Negligible Beneficial	Once completed the vast majority of the introduced built form will be screened from view. Where the uppermost parts of the introduced buildings are visible they will be seen to gently rise up in height towards the location of the new Village Square, and thus helping to signpost the centre of Roehampton and thereby assisting in wayfinding and legibility.
22	View north from Richmond Park near Spankers Hill Wood	Medium	High	High	Very Small	Negligible Beneficial	Once completed the vast majority of the introduced built form will be screened from view. Where the uppermost parts of the introduced buildings are visible they will be seen to gently rise up in height towards the location of the new Village Square, and thus helping to signpost the centre of Roehampton and thereby assisting in wayfinding and legibility.

Ref	Name	Sensitivity	Magnitude	Significance
1	View south-west from Roehampton Playing Fields	Medium	None	Neutral

View 01 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 18.04.18 | Time 12:12

51

View 01 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

52

The Development will not be visible as it will be screened from view by the intervening mature vegetation and built forms.

Ref	Name	Sensitivity	Magnitude	Significance
2	View west from Medfield Street / edge of Putney Heath	Medium	Medium	Minor Beneficial

View 02 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 17.04.18 | Time 09:42

53

View 02 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

54

The Development will be visible in the background of the view, with Block O helping to create and define a new vista that assists in wayfinding and legibility.

Ref	Name	Sensitivity	Magnitude	Significance
3	View north-west from A306 Roehampton Lane near Ponsonby Road	Low	Medium	Negligible Beneficial

View 03 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1619mm | Nominal lens rise 0mm | Date 17.04.18 | Time 09:50

55

View 03 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

56

The Development will be visible in the background of the view, with Blocks O and K forming the main focus to the view, with the chamfered edge of the former helping to lead the eye through the streetscape.

Ref	Name	Sensitivity	Magnitude	Significance
4	View west from A306 Roehampton Lane / Medfield Street	Low	Large	Moderate Beneficial

View 04 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1624mm | Nominal lens rise 0mm | Date 17.04.18 | Time 09:50

57

View 04 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

58

The new built form will frame the Village Square, with the detailing of these buildings representing a higher visual aesthetic combined with the urban greening, offsetting the loss of open sky visible.

Ref	Name	Sensitivity	Magnitude	Significance
5	View south-west from Roehampton High Street	Medium	Medium	Minor Beneficial

View 05 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 17.04.18 | Time 10:06

59

View 05 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

60

Channelled views of Block O will be obtained, replacing views of the existing high-rise built form with one of comparable height – with the materiality and elevational strategy providing a more positive visual aesthetic, improving the composition of the view.

Ref	Name	Sensitivity	Magnitude	Significance
6	View north-west from Holybourne Avenue	Medium	Large	Minor Beneficial

View 06 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1682mm | Nominal lens rise 0mm | Date 17.04.18 | Time 10:21

61

View 06 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

62

Block A will appear as a distinctive new landmark, with the articulation in the façade providing visual interest. Block B will also be visible, appearing larger in scale than the existing built form and consequently resulting in increased enclosure.

Ref	Name	Sensitivity	Magnitude	Significance
7	View north-east from Roehampton Recreation Centre	Medium	Small	Negligible Beneficial

View 07 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 18.04.18 | Time 09:42

63

View 07 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

64

Once completed, the uppermost storeys of Blocks B, C, D, E and F will be visible, and will be seen to gradually step up in height, thereby helping to signpost the centre of Roehampton and thus assisting in wayfinding and legibility.

Ref	Name	Sensitivity	Magnitude	Significance
8	View west from A306 Roehampton Lane	Low	Large	Moderate Beneficial

View 08 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1654mm | Nominal lens rise 0mm | Date 21.02.19 | Time 14:00

65

View 08 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

66

The completed Village Square will form the focus of the view, framed by Blocks O, A and B. While the built form will be of a larger scale than the existing buildings, their increased height will help to emphasise their landmark function but also the significance of the Village Square.

Ref	Name	Sensitivity	Magnitude	Significance
9	View south-west from Rodway Road / Akehurst Street	Medium	Medium	Minor Beneficial

View 09 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1642mm | Nominal lens rise 0mm | Date 17.04.18 | Time 10:29

67

View 09 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

68

Block N will form the main focus to the view, and while of a greater scale that the exiting built form, its warmer hue bricks and gold aluminium details will better complement the red brick detailing present on Rodway Road. The deep and wide reveals in the elevation will diminish the perceived height of the building.

Ref	Name	Sensitivity	Magnitude	Significance
10	View south-east from A306 Roehampton Lane	Low	Large	Minor Beneficial

View 10 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1621mm | Nominal lens rise 0mm | Date 17.04.18 | Time 10:37

69

View 10 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

70

The Development will result in additional enclosure and help to frame the streetscape, while the modulation in height and articulation in the façades and contrasting materiality ensures that the built form does not appear bulky and provides visual interest, offsetting the loss of trees visible.

Ref	Name	Sensitivity	Magnitude	Significance
11	View south from A306 Roehampton Lane / Holford Way	Low	Medium	Minor Beneficial

View 11 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1628mm | Nominal lens rise 0mm | Date 17.04.18 | Time 12:14

71

View 11 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

72

The viewers eye will be drawn towards Block Q, with the ordered façade of this 6-storey building reflecting the architectural language of Chadwick Hall. Decorative brick detailing within the recessed bays will provide a fine detail and depth that will enhance visual interest, and on balance improving the composition of the view despite the loss of the extent of sky visible.

Ref	Name	Sensitivity	Magnitude	Significance
12	View south from Ellisfield Drive	Medium	Large	Moderate Beneficial

View 12 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1625mm | Nominal lens rise 0mm | Date 17.04.18 | Time 10:44

73

View 12 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

74

Block K will form the main focus of the view, with the materiality and detailing reflecting the architectural language of the nearby Point Blocks and Slab Blocks of Alton Estate. Landscape treatments will serve to help soften the appearance of introduced built form, better integrating them into the fabric of the townscape and enhancing the visual amenity experience.

Ref	Name	Sensitivity	Magnitude	Significance
13	View east along Danebury Avenue	Medium	Large	Negligible Beneficial

View 13 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1579mm | Nominal lens rise 0mm | Date 18.04.18 | Time 10:52

75

View 13 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

76

The viewers eye will be led through the streetscape, with the built form framing the view and resulting in a visually pleasing composition as a result of the unified building lines. Planting proposals within the public realm will also help to soften the appearance of the built form.

Ref	Name	Sensitivity	Magnitude	Significance
14	View south-west across Downshire Field	Medium	Small	Negligible Beneficial

View 14 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1622mm | Nominal lens rise 0mm | Date 17.04.18 | Time 12:03

77

View 14 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

78

The thinning of trees within Downshire Field will open up an historic vista, whilst landscape enhancements, including those associated with the playspace, will enhance visual amenity.

Ref	Name	Sensitivity	Magnitude	Significance
15	View north-west from Danebury Avenue	Medium	Very Small	Neutral

View 15 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1574mm | Nominal lens rise 0mm | Date 17.04.18 | Time 10:59

79

View 15 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

80

A small proportion of the eastern elevation of Portswood Place will be visible, as will some of the landscaping works (including hardscape elements such as the concrete sett paving in the streetscape).

Ref	Name	Sensitivity	Magnitude	Significance
16	View west from Swanwick Close / Minstead Gardens	Medium	None	Neutral

View 16 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1620mm | Nominal lens rise 0mm | Date 17.04.18 | Time 11:06

81

View 16 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

82

The Development will not be visible as it will be screened from view by the intervening mature vegetation and built forms.

Ref	Name	Sensitivity	Magnitude	Significance
17	View south from Downshire Field	Medium	Medium	Minor Beneficial

View 17 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 17.04.18 | Time 11:55

83

View 17 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

84

The built form of Portswood Place will form the main focus of the view. The buildings, consisting of a 'U -shape' of one and two storeys, will be of a comparable height to the exiting built form but of a greater architectural aesthetic owing to the juxtaposition between concrete and timber, punctuated by large expanses of glazing. Planting proposals along Danebury Avenue and in front of the building will soften the appearance of the built form

Ref	Name	Sensitivity	Magnitude	Significance
18	View north-east from Mount Clare	Medium	Small	Negligible Beneficial

View 18 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1628mm | Nominal lens rise 0mm | Date 17.04.18 | Time 11:15

85

View 18 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

86

Portswood Place will be visible at the foot of the slope and will largely blend into the view, being of a comparable height to the existing built form.

Ref	Name	Sensitivity	Magnitude	Significance
19	View south-east from Sherfield Gardens / Highcliffe Drive	Medium	Very Small	Neutral

View 19 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1642mm | Nominal lens rise 0mm | Date 18.04.18 | Time 11:44

87

View 19 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 368mm. Please refer to section 2.8 on page 4 of this document for further information.

88

Glimpses through the vegetation towards Portswood Place and Block Q are likely to be obtained, although they will not draw the eye and will cause a barely perceptible change in the view.

Ref	Name	Sensitivity	Magnitude	Significance
20	View east from Richmond Park, west of Roehampton Gate	High	Very Small	Neutral

View 20 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 18.04.18 | Time 09:33

89

View 20 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 399mm. Please refer to section 2.8 on page 4 of this document for further information.

90

Once completed the vast majority of the introduced built form will be screened from view. Where the uppermost parts of the introduced buildings are visible they will be seen in the context of the existing high-rise point and slab blocks, and will be of a reduced scale and height to these elements, thus maintaining their subservience to these features.

Ref	Name	Sensitivity	Magnitude	Significance
21	View north-east from Richmond Park near White Lodge	High	Very Small	Negligible Beneficial

View 21 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 18.04.18 | Time 10:25

91

View 21 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 399mm. Please refer to section 2.8 on page 4 of this document for further information.

92

Once completed the vast majority of the introduced built form will be screened from view. Where the uppermost parts of the introduced buildings are visible they will be seen to gently rise up in height towards the location of the new Village Square, and thus helping to signpost the centre of Roehampton.

Ref	Name	Sensitivity	Magnitude	Significance
22	View north from Richmond Park near Spankers Hill Wood	High	Very Small	Negligible Beneficial

View 22 existing

Single frame image | Focal length 24.25mm | Camera height above survey point 1650mm | Nominal lens rise 0mm | Date 18.04.18 | Time 10:59

93

View 22 proposed

To achieve the optimum viewing distance of between 300-500mm (as per The Landscape Institute's guidelines), we recommend printing this image edge to edge on A2 landscape and viewing it on site from a distance of 399mm. Please refer to section 2.8 on page 4 of this document for further information.

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Once completed the vast majority of the introduced built form will be screened from view. Where the uppermost parts of the introduced buildings are visible they will be seen to gently rise up in height towards the location of the new Village Square, and thus helping to signpost the centre of Roehampton.

Operational Phase – Year 15

7.132 The Development at Year 15 of operation is considered within the Residual Effects section of this chapter due to the additional integration and screening effects provided by the establishment of the landscape planting and mitigation measures.

Mitigation Measures

Construction Phase

7.133 Mitigation measures to further reduce the temporary effects of construction are proposed as follows:

- The preparation of a Construction Environmental Management Plan (CEMP), including for agreeing appropriate working hours with the LBW to ensure that the adverse effects of construction activities are not experienced at times when receptors could reasonably expect a cessation works, e.g. during evenings, weekends and bank holidays;
- The use of solid hoardings enclosing the Site where construction activities are in proximity to visual receptors, to screen construction activities at ground level;
- Controlling the lighting of construction compounds and machinery to minimise upward and outward light pollution through lantern design, direction and baffling, and ensuring that the minimum area only is lit, for the minimum period of time while satisfying other health and safety requirements;
- Restricting the movement of stockpiles to minimise vehicle tracking across the Site and perception of instability in the townscape;
- Locating compounds and stockpiles in the least visible locations with the Site, including for rendering of facades to aid in integrating their form within views; and
- Protecting all retained vegetation on Site and within its immediate setting during construction by fencing, installed before the commencement of construction activity of any phase of the Development and in compliance with BS5837:2012 'Trees in relation to design, demolition and construction – Recommendations'[xv].

Operational Phase – Year 1 and Year 15

7.134 Mitigation measures to further the potential for adverse effects at Year 1 and Year 15 during the operational phase are proposed as follows:

- The implementation and maintenance of the hard and soft landscape proposals throughout the lifetime of the Development, including advanced planting where practicable (and within first available planting season); and
- The adoption of the Parameter Plans and Design Codes as set out in the accompanying planning application material, which includes utilising a materiality and tonality palette that reflects or complements the built vernacular of the surrounding townscape.

Residual Effects

7.135 The assessment of residual effects refers to the likely effects of the Development that will remain once the additional mitigation measures as set out above are applied. The assessment of residual effects for the Operational Phase – Year 15 takes into account the ongoing establishment of vegetation within the Site. Appendix 7.5, Appendix 7.6 and Appendix 7.7 set out in full the residual effects that will arise for the receptors identified.

Construction Phase

Heritage Effects

7.136 There will be no significant residual effects (i.e. those of 'Moderate' or 'Major' significance) on Built Heritage receptors during the construction phase. This is predominantly because most aspects of the Development do not entail direct (i.e. physical) impacts upon designated heritage assets. The only Built Heritage receptor that will be directly affected by the Development will be the Alton Conservation Area, the boundary of which takes in much of the Site. As outlined at Appendix 7.5, during the construction phase, the Development will have a residual, direct, temporary effect on the Alton Conservation Area of minor adverse significance. Most impacts on heritage assets from the Development are indirect, affecting parts of their settings rather than their fabric, and thus give rise to lower magnitudes of change to the assets' sensitivity than if they were direct impacts. Non-significant residual effects are discussed at Appendix 7.5. It is considered that, during the construction phase, there will be residual, indirect, temporary effects of minor adverse significance in respect of: the Richmond Park RPG; the Alton Conservation Area; the Roehampton Village Conservation Area; the Westmead Conservation Area; the King's Head public house; the Montague Arms public house; Parkstead House; Mount Clare; Downshire House; the Drinking Fountain; the Highcliffe Drive slab blocks; the bungalows at Nos. 1-13, 2-16 & 15-33 Minstead Gardens and Nos. 245-255 & 257-261 Danebury Avenue; The Bull; The Watchers; the Mount Clare HP&G; Nos. 24 & 26 Roehampton High Street; Hartfield; and Nos. 5 & 7 Rodway Road.

Townscape Effects

7.137 During the construction phase the protection of existing vegetation surrounding the Site in accordance with BS5837:2012, in combination with the control of the movement of material, lighting restrictions, the siting of construction compounds and the use of low level hoardings will reduce the potential for adverse effects on townscape character and reduce the sense of fragmentation in the townscape, whilst advanced planting will serve to provide enclosure of construction plant and machinery. However, the overarching significance of effects experienced will remain as set out previously and within Appendix 7.6, including for TCA 4 – Alton West where a Large magnitude of effect will be experienced, which combined with the Medium sensitivity of the TCA, will result in a Moderate Adverse significance of effect.

Visual Effects

7.138 Additional mitigation measures introduced during the construction phase to reduce the potential for adverse visual effects include advanced planting to provide additional screening, the erection of low-level hoardings, careful siting and movement of stockpiles within the Site, limiting of working hours, and controls on lighting lantern design and duration. The effects experienced will be temporary and reversible in nature, lasting only for the duration of the construction activities.

7.139 Whilst the mitigation measures proposed serve to diminish the residual effects experienced, generally the overall effect on visual amenity will not appreciably reduce during the construction phase due to the prominence of the tall plant and machinery (including cranes). A notable exception however is in the views south-east from the A306 Roehampton Lane (Viewpoint 10), whereby the provision of hoardings along the A306 Roehampton Lane will serve to screen much of the construction works due to the way in which the landform falls away from the viewer. As such the magnitude of effect will be reduced to Medium such and on balance the significance of effect will be Minor Adverse and no longer be considered significant. However, the noticeable loss of trees within the views obtained when travelling along A306 Roehampton Lane will persist.

Operational Phase – Year 1

7.140 In most cases significant effects will reduce over time as the embedded planting establishes itself and reaches its designed intention through on-going management. As such, the mitigation measures proposed, i.e. advanced planting, will make a limited contribution to reducing adverse effects at Year 1. In this regard, the assessment of the residual effects of

the Development is considered for Year 15 of the Operational Phase, whereby the planting will be established.

Operational Phase – Year 15

Heritage Effects

7.141 There will be no significant residual effects (i.e. those of 'Moderate' or 'Major' significance) on Built Heritage receptors at Year 15 of the operational phase. This is predominantly because most aspects of the Development do not entail direct (i.e. physical) impacts upon designated heritage assets. As noted above, the only Built Heritage receptor that will be directly affected by the Development will be the Alton Conservation Area, the boundary of which takes in much of the Site. As discussed further at Appendix 7.5, due to the considered massing and high design quality of the proposed new buildings and landscaping works, it is considered that there will be a residual, direct, permanent effect on the Alton Conservation Area of minor beneficial significance. Most impacts on heritage assets from the Development are indirect, affecting parts of their settings rather than their fabric, and thus give rise to lower magnitudes of change to the assets' sensitivity than if they were direct impacts. Non-significant residual effects are discussed at Appendix 7.5. However, it is worth mentioning here that it is considered that there will be a residual, indirect, permanent effect on the Alton Conservation Area of minor beneficial significance. As discussed at Appendix 7.5, there will also be residual, indirect, permanent effects of minor beneficial significance in respect of several other heritage assets. There will be residual, indirect, permanent effects of minor adverse significance in respect of four Built Heritage receptors: the Richmond Park RPG; Parkstead House; Downshire House; and Hartfield.

Townscape Effects

7.142 Through the early planting and establishment of the planting proposals and their ongoing maintenance, the overall condition of the vegetation within the areas of public realm within the Site will be noticeably improved by Year 15, softening the appearance of the introduced built form and assisting in their integration into the townscape.

7.143 Furthermore, these enhancements to the landscape will provide a robust and coherent landscape framework that improves the biodiversity value of the Site, while also tying in with other wider green infrastructure linkages and creating a more harmonious environment for those living, working, visiting and passing through the area. Accordingly, with respect to TCA 4 – Alton West, a Large magnitude of effect will arise, which combined with the Medium sensitivity of the TCA, will result in a Moderate Beneficial significance of effect at Year 15.

Visual Effects

7.144 By Year 15 the proposed planting will have established and will improve the landscape structure to the Site and aid in integrating and softening the appearance of the introduced built form where visible. Generally, where this built form is visible the overall magnitude of effect experienced (and subsequently significance of effect) will not alter as the principal deciding factor for the extent to which views are affected for this Development relates to the overall scale, bulk and mass of the built form and how this sits within the views obtained.

7.145 However, the adoption of the Parameter Plans and Design Codes will play a crucial role in ensuring that the introduced built forms of the 'outline element' of the Development are successfully integrated into the townscape and so that they contribute positively to the visual amenity experience. It is a combination of these factors that results a Moderate Beneficial significance of effect being experienced by receptors at Viewpoint 6 and Viewpoint 13 at Year 15.

7.146 In addition, in relation to the views from Downshire Field towards Portswood Place, the planting proposals along Danebury Avenue and in front of the building will soften the appearance of the built form (which in itself is a high quality building), and which over time will help to further integrate the townscape and improve the composition of the view. Accordingly, a Large magnitude of effect will be experienced, which combined with the Medium sensitivity of receptors at this location, will result in a Moderate Beneficial significance of effect.

Cumulative Effects

7.147 The assessment has considered the combined effects of the Development with the other committed development in the vicinity of the Site (as identified in Chapter 2 of the ES and illustrated on Figure 2.1):

- Cumulative Scheme A – University of Roehampton, Digby Stuart and Southlands Colleges (2017/6617).

Heritage Effects

7.148 The 4-5 storey buildings to be constructed for Digby Stuart and Southlands Colleges to the north-west of the Grove House Registered Park and Garden will be largely screened from the Registered Park and Garden and the present Site by existing buildings and mature vegetation.

Both the local authority and Historic England were content that these proposals would not result in any adverse impacts upon any designated heritage assets. Thus, it is considered that the cumulative impact of the Development with this scheme remains the same as for the Development when considered in isolation.

Townscape Effects

7.149 The introduction of the committed development would result in new contemporary larger scale massing along the A036 Roehampton Lane corridor. The Development would contribute positively to this more contemporary context and be perceived as part of this wider regeneration. However, the collective beneficial effects on Roehampton as a whole are not considered to represent a significant cumulative townscape effect. Moreover, while not established as a 'committed development', we are aware of the proposals in relation to the nearby Minstead Gardens, which includes for the refurbishment, extension and enhancement of the collection of bungalows that line this road. These positive additions in the nearby townscape, in combination with the interventions within the Site, will add to the beneficial changes that will arise as a result of the ongoing regeneration in the area.

Visual Effects

7.150 There are very few locations where both the Development and the committed development would be seen in conjunction with one another, with the exception being from the elevated Richmond Park, and accordingly combined visual effects are limited. Similarly, in-succession effects are limited to few locations and therefore the principal means of experiencing cumulative visual effects will be obtained when travelling through the townscape (i.e. sequentially). While beneficial effects will undoubtedly arise as a result of the introduction of the Development and the other committed development, with an enhancement to the overall visual amenity experience when passing along the A306 Roehampton Lane, these are not considered to constitute significant cumulative visual effects. In relation to the nearby renovation occurring on Minstead Gardens, in the localised views obtained the visual amenity experience will be enhanced.

Summary

7.151 An assessment of the likely heritage, townscape and visual effects that will arise as a result of the Development has been undertaken in accordance with the Standard and Guidance for Historic Environment Desk-Based Assessment of the Institute for Archaeologists, Historic England's Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment, Historic Environment Good Practice Advice in Planning 3: The

Setting of Heritage Assets, and the Guidelines for Landscape and Visual Impact Assessment, Third Edition.

7.152 The Site forms part of the existing settlement pattern of Roehampton, with the historic village core of Roehampton adjoining the Site to the east, centred around the junction between the A306 Roehampton Lane, Danebury Avenue and Roehampton High Street. The Site itself consists of a variety of built form, including a series of point blocks (smaller footprint with massing arranged vertically), maisonettes and bungalows (and adjacent to the Le Corbusier inspired slab blocks (larger footprint with massing arranged horizontally)) - all sitting within the landscaped grounds of Downshire Field.

7.153 East of the A306 Roehampton Lane, the landform gently rises and consists predominantly of residential built form, with a pocket of commercial uses in the vicinity of Roehampton High Street. To the north and north-east of the Site there are a series of institutional uses and a well-vegetated golf course, with the built form generally of a larger scale and massing than the built form to the east. South-east of the Site, west of the A306, the land use consists of residential built form (including student accommodation) and institutional uses. To the west of the Site there are a series of point blocks and maisonettes, while to the south-west lies the partly wooded Richmond Park, which gradually rises in height and affords panoramic views across London.

7.154 To provide a finer grain of detail to the published character assessments covering the Site and surrounding areas, a number of Townscape Character Areas (TCAs) were identified via desk-based study and fieldwork, with the Site itself identified across two TCAs: Alton West (TCA 4) and Alton Gardens (TCA 5).

7.155 A visual appraisal was also undertaken, which demonstrated that from the elevated plateau landscape to the east of the Site, views of the Site are obstructed by the intervening vegetation and built form associated with the redeveloped Queen Mary's Place. However, glimpses of the existing built forms are obtained in views along the sloping streets that are orientated towards the Site. Similarly, views of the existing built form within the eastern part of the Site are obtained by those travelling along A306 Roehampton Lane, with the built form larger in its scale and massing than the typically two-to-three storey properties that lie to the east.

7.156 From the landscape to the west of the Site, comprising recreational space associated with Richmond Park, there are a number of elevated vantage points that offer views across the Site and further afield towards Wandsworth. However, from the majority of Richmond Park successive bands of woodland vegetation screen views and provide a sense of enclosure and

physical containment. Where the Site is visible from Richmond Park, the built form visibly breaks the wooded skyline and is seen in the context of the imposing point blocks.

7.157 Those heritage assets that could potentially be affected by the Development were identified using professional judgement, following a series of Site visits and archive research. The list of heritage assets has also been refined through pre-application discussions with the LBW and Historic England. The design of the Development has evolved as part of an iterative process and has been informed by the findings of the baseline heritage, townscape and visual amenity condition identified.

7.158 The assessment of the heritage, townscape and visual effects of the Development has been undertaken during the construction phase, at Year 1 of operation, and at Year 15 of the operational phase. The assessment has identified that no significant effects on heritage receptors will arise during either the construction phase or during operation, while significant effects on townscape character will be limited to the construction phase, due to the presence of construction activities leading to a sense of instability and fragmentation in the townscape that alters the key characteristics of TCA4 – Alton West.

7.159 Despite the scale and extent of the Development, there will be no significant effects on Built Heritage receptors during either the construction phase or during operation, predominantly because most aspects of the Development do not entail direct (i.e. physical) impacts upon the heritage assets. The only Built Heritage receptor that will be directly affected by the Development will be the Alton Conservation Area. During the construction phase, the demolition and construction activity associated with the Development will have a direct, temporary effect on the conservation area of minor adverse significance; during the operational phase, the Development will have a direct, permanent effect on the conservation area of minor beneficial significance. The settings of the identified Built Heritage receptors account for only a proportion of their overall sensitivity. Thus, whilst the settings of some heritage assets will undergo considerable change, it does not follow that the impact on their sensitivity will be of 'Major' or 'Moderate' magnitude. During the construction phase, the visual impression of mutability and fragmentation of the townscape that will arise will result in indirect, temporary effects of minor adverse significance to quite a number of heritage assets. During operation, however, many of the heritage assets would undergo indirect, permanent effects of minor beneficial significance, with only four assets – the Richmond Park RPG; Parkstead House; Downshire House; and Hartfield – experiencing indirect, permanent effects of minor adverse significance.

7.160 With regards to significant visual effects, these will be experienced by receptors at 7 of the identified representative viewpoints during the construction phase, viewpoints 4, 6, 8, 10, 12,

13, and 17. The potential for significant visual effects to arise during Year 1 of the operational phase is limited to 2 of the identified representative viewpoints, viewpoints 4 and 8, whereby the changes will result in significant beneficial effects. By Year 15, the maturation of planting proposals will result in additional significant beneficial effects arising, relating to viewpoints 6 and 13.

7.161 No significant cumulative effects have been identified.

7.162 Table 7.5 contains a summary of the likely significant effects of the Development, with Appendix 7.5, Appendix 7.6 and Appendix 7.7 outlining in detail the likely heritage, townscape and visual effects that will arise as a result of the Development.

Table 7.5: Table of Significance - Heritage, Townscape and Visual Amenity

Potential Effect	Nature of Effect	Significance	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects
				I	UK	E	R	C	B	L	
Construction											
Heritage Assets	Temporary	Minor Adverse - Negligible	Protection of vegetation; locating compounds and stockpiles in least sensitive locations; limiting movements; controlling lighting and working hours; providing hoardings; minimising duration of tall plant and machinery on Site.	*	*				*	*	Minor Adverse – Negligible
Townscape Character	Temporary	Moderate Adverse - Neutral								*	Moderate Adverse - Neutral
Visual Receptors	Temporary	Major Adverse – Negligible							*	*	Moderate Adverse - Negligible
Completed Development											
Heritage Assets	Permanent	Minor Beneficial – Minor Adverse	Enhancement of vegetation within Site, with advanced planting where practicable; ongoing management and maintenance of hard and soft landscaping measures; and applying the Design Codes to the 'outline elements'.	*	*				*	*	Minor Beneficial – Minor Adverse
Townscape Character	Permanent	Minor Beneficial - Neutral								*	Moderate Beneficial - Neutral
Visual Receptors	Permanent	Moderate Beneficial - Neutral							*	*	Moderate Beneficial - Neutral
Cumulative Effects											
Construction Phase											
No significant cumulative effects.											
Operational Phase											
No significant cumulative effects.											

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 8 Archaeology

BARTON WILLMORE

8. ARCHAEOLOGY

Introduction

8.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of below-ground archaeology.

Policy Context

National Planning Policy Framework[1]

8.2 In February 2019, the Government published the *National Planning Policy Framework* (NPPF), which supersedes previous national planning guidance. The NPPF is supplemented by the *National Planning Practice Guidance* (PPG)[2], published in March 2014. The NPPF and PPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: *GPA 1: The Historic Environment in Local Plans*[3]*, GPA 2: Managing Significance in Decision-Taking in the Historic Environment*[4], and *GPA3: The Setting of Heritage Assets*[5]*.* In short, Government policy provides a framework which:

- Has a presumption in favour of the conservation and enhancement of designated heritage assets and their settings;
- Takes into account the desirability of sustaining and enhancing the significance of heritage assets (designated and non-designated);
- Requires applicants to provide proportionate information on heritage assets affected by their proposals and an assessment of the impact of a proposed development on the significance of those heritage assets; and
- Accepts that harm to heritage assets may be justified where balanced or exceeded by community or other benefits arising from proposals, and/or where other mitigation is provided for, such as the recording of assets and publication of the resulting evidence.

Strategic Planning Policy

London Plan 2016[6]

8.3 The relevant Strategic Development Plan framework is provided by the London Plan published 22 July 2011. Policy relevant to archaeology at the study sites include:

Policy 7.8 Heritage Assets and Archaeology

Strategic

a. *London's heritage assets and historic environment, including listed buildings, registered historic parks and gardens and other natural and historic landscapes, conservation areas, world heritage sites, registered battlefields, scheduled monuments, archaeological remains and memorials should be identified, so that the desirability of sustaining and enhancing their significance and of utilising their positive role in place shaping can be taken into account.*
b. *Development should incorporate measures that identify, record, interpret, protect and, where appropriate, present the site's archaeology.*

Planning Decisions

c. *Development should identify, value, conserve, restore, re-use and incorporate heritage assets, where appropriate.*
d. *Development affecting heritage assets and their settings should conserve their significance, by being sympathetic to their form, scale, materials and architectural detail.*
e. *New development should make provision for the protection of archaeological resources, landscapes and significant memorials. The physical assets should, where possible, be made available to the public on-site. Where the archaeological asset or memorial cannot be preserved or managed on-site, provision must be made for the investigation, understanding, recording, dissemination and archiving of that asset.*

8.4 A new London Plan has been prepared in draft[7] and is a material consideration but is given limited weight. Chapter 7 'Heritage and Culture' contains relevant draft polices HC1 to HC7. Of particular relevance to sites containing non-designated heritage assets is draft policy HC1 as follows:

HC1 Heritage and Conservation Growth

a. *Boroughs should, in consultation with Historic England and other relevant statutory organisations, develop evidence that demonstrates a clear understanding of London's historic environment. This evidence should be used for identifying, understanding, conserving, and enhancing the historic environment and heritage assets, and improving access to the heritage assets, landscapes and archaeology within their area.*
b. *Development Plans and strategies should demonstrate a clear understanding of the historic environment and the heritage values of sites or areas and their relationship with their surroundings. This knowledge should be used to inform the effective integration of London's heritage in regenerative change by:*
    1. *setting out a clear vision that recognises and embeds the role of heritage in place-making*
    2. *utilising the heritage significance of a site or area in the planning and design process*

3. *integrating the conservation and enhancement of heritage assets and their settings with innovative and creative contextual architectural responses that contribute to their significance and sense of place*
4. *delivering positive benefits that sustain and enhance the historic environment, as well as contributing to the economic viability, accessibility and environmental quality of a place, and to social wellbeing.*

Development proposals affecting heritage assets, and their settings, should conserve their significance, by being sympathetic to the assets' significance and appreciation within their surroundings. The cumulative impacts of incremental change from development on heritage assets and their settings should also be actively managed. Development proposals should seek to avoid harm and identify enhancement opportunities by integrating heritage considerations early on in the design process.

Development proposals should identify assets of archaeological significance and use this information to avoid harm or minimise it through design and appropriate mitigation. Where applicable, development should make provision for the protection of significant archaeological assets and landscapes. The protection of undesignated heritage assets of archaeological interest equivalent to a scheduled monument should be given equivalent weight to designated heritage assets.

Local Planning Policy

8.6 The relevant Development Plan framework is provided by the Wandsworth Local Plan which consists of a series of documents which sets out the spatial vision for Wandsworth and a strategy for how this vision will be achieved. The Development Management Policies Document (DMPD)[12] and Site Specific Allocations Document (SSAD)[13], both adopted in March 2016, support the strategic objectives set out in the Core Strategy (adopted March 2016). Policies relevant to archaeology in these documents are:

- Core Strategy- Strategic Objective 3.3 (Environmental Objectives) and Policy IS3 (Good Quality Design and Townscape); and
- DMPD- Policy DMS 2 Managing The Historic Environment.

Legislative Context

8.7 Legislation regarding archaeology, including Scheduled Monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002.

Assessment Methodology

8.8 No standard methodologies exist for assessing the likely significant effects of a development on the environment with respect to archaeology through the EIA process. However, assessment methodology has been guided by various published documents including: English Heritage, Conservation Principles, Policy and Guidance[8], the Historic Environment Good Practice Advice Planning Advice Note 3[5] and the Design Manual for Roads and Bridges (DMRB)[9]. Although the latter was designed as best-practice for road schemes in particular it is accepted as best-practice for the assessment of cultural heritage in relation to archaeology, listed buildings and historic landscapes, generally.

8.9 The assessment in this chapter is a qualitative one, and the evaluation of significance is ultimately a matter of professional judgement.

8.10 A three-stage approach is adopted in order to reach an understanding of the level of any effect that a proposed development may have on a heritage asset. It is necessary to understand the significance of the asset and the proposed impacts on the asset to assess the overall effect on identified assets.

8.11 Using a matrix that measures both asset importance (significance in the context of NPPF terminology) and impact magnitude produces an assessment of the level of the effect of the proposed development on identified assets. This approach, including the matrices themselves, is set out below in Tables 8.1-8.3.

8.12 To inform this assessment of significance, a desk-based assessment was prepared in accordance with the NPPF. The assessment drew together the available archaeological, historic, topographic and land-use information in order to clarify the archaeological interest of the Site. Additionally, in accordance with the 'Standard and Guidance for Historic Environment Desk-Based Assessments'[10] the assessment included an examination of evidence on the Greater London Historic Environment Record (GLHER) and other sources, including the Wandsworth Local Studies Library and the London & Metropolitan Archives. The report also included the results of a comprehensive map regression exercise and review of on-line aerial

photographs and available LIDAR data. A Site visit was conducted in August 2017. No intrusive archaeological evaluation has been undertaken.

Significance Criteria

8.13 There are no national government guidelines for evaluating the significance of different types of heritage asset. For archaeological remains, The Department for Culture, Media and Sport (DCMS) has adopted a series of principles criteria for use in the determination of national importance when scheduling ancient monuments[11]. The criteria include period, rarity, documentation, group value, survival / condition, fragility / vulnerability, diversity and potential and can be used as a basis for the assessment of the importance of archaeological sites and remains. However, the document also states that these principles "*should not be considered definitive, but as indicators that contribute to a broader judgment based on individual circumstances"*.

Table 8.1 Criteria for evaluating the importance of heritage assets

Importance of Asset	Equivalent to
Very high	World Heritage Sites Assets of acknowledged international significance Assets that can contribute significantly to acknowledged international research objectives
High	Scheduled Monuments Undesignated assets of schedulable quality Assets that can contribute significantly to acknowledged national research objectives
Medium	Designated or undesignated assets (including historic landscape) that contribute to regional research objectives
Low	Undesignated assets (including historic landscape) of local significance Assets compromised by poor preservation and/or poor survival of contextual associations Assets of limited importance, but with potential to contribute to local research objectives
Negligible	Assets with very little or no surviving archaeological interest

Assessment of Impacts

8.14 The magnitude of impact is assessed without regard to the importance of the asset. In terms of the judgment of the magnitude of impact this is based on the principle (established in NPPF) that preservation of the asset is preferred and that total physical loss of the asset is the least preferred.

8.15 DMRB[9] sets out that:

> *"The total destruction of a Low Value asset will have the same magnitude of impact on the asset as the total destruction of a High*

Value asset; the value of the asset is factored in when the significance of the effect is assessed.

8.16 The survival of archaeological remains is often uncertain without archaeological evaluation and in these circumstances the magnitude of impact can only be estimated or stated as unknown. The magnitude of change resulting from the impact may vary depending on the nature of past development or management effects (e.g. extent of truncation and made ground) and the various forms of development impact.

8.17 Impacts may be direct on monuments, boundaries or buried remains, including destruction, compression, vibration, or drying out (where waterlogged). Indirect impacts may arise from a reduction of the appreciation of the resource by visual intrusion, noise and dust for example, or by severance (i.e. removal of the monument or site from its context).

Table 8.2 Magnitude of impacts

Magnitude of impact	Description of change
Major	Change to most or all key archaeological materials, such that the resource is totally altered. Comprehensive changes to setting.
Moderate	Changes to many key archaeological materials, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset.
Minor	Changes to key archaeological materials, such that the asset is slightly altered. Slight changes to setting.
Negligible	Very minor changes to archaeological materials, or setting.

Assessment of Effects

8.18 The assessment of effects is a combination of the importance of the heritage asset and the magnitude of impact on that asset. Effects can be adverse or beneficial and temporary or permanent. It should be noted that effects to archaeology largely arise from the construction phase and that, in the case of archaeology, such effects are often permanent and non-reversible.

8.19 Beneficial effects are those that mitigate existing impacts and help to restore or enhance the importance/value of heritage assets, therefore allowing for greater understanding and appreciation of it. Effects that are moderate or above are considered significant in EIA Terms.

Table 8.3 Significance matrix

Importance of Asset	Magnitude of impact			
	Major	Moderate	Minor	Negligible
Very High	Major	Major	Major	Moderate
High	Major	Major / Moderate	Moderate	Negligible
Medium	Major / Moderate	Moderate	Moderate / Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Minor / Negligible	Negligible	Negligible	Negligible

Limitations and Assumptions

8.20 The desk-based assessment's conclusions are limited by the extent of existing information. Its usefulness in predicting the actual archaeological resource must therefore be qualified. There is some uncertainty attached to the baseline data sources that includes:

- The Historic Environment Record (HER) and National Monument Record (NMR) can be limited because it depends on random opportunities for research, fieldwork and discovery.
- There is sometimes a lack of dating evidence for sites on the HER /NMR.
- Documentary sources are rare before the medieval period, and many historic documents are inherently biased. Older primary sources often fail to accurately locate sites and interpretation can be subjective.
- The extent of truncation caused by previous development impacts and landscaping works cannot be fully ascertained.

8.21 The principal limitation to the assessment of effects upon below ground heritage assets is the nature of the archaeological resource, which is buried and therefore not visible. This means it can be difficult to accurately predict the presence and likely importance of below ground heritage assets, and the likely impact (and resultant effects) of development upon such assets.

Baseline Conditions

8.22 The current baseline conditions are informed by the Archaeological Desk-Based Assessment (see Appendix 8.1), which focuses on the Site and a surrounding 1km radius (the "Study Area"). A summary of the assessment is presented below and the archaeological results are discussed (where relevant) by archaeological periods, as follows:

- Palaeolithic 450,000 - 12,000 BC
- Mesolithic 12,000 - 4,000 BC
- Neolithic 4,000 - 1,800 BC
- Bronze Age 1,800 - 600 BC
- Iron Age 600 - AD 43
- Roman AD 43 - 410
- Anglo Saxon/Early Medieval AD 410 - 1066
- Medieval AD 1066 - 1485
- Post Medieval AD 1486 - 1749
- Modern AD 1750 – Present

Desk-Based Assessment

8.23 The solid geology of the study is shown by the Institute of Geological Sciences (IGS 1979) and British Geological Survey Sheet 270 (South London 1998) as London Clay deposits forming the London Basin. Overlying these deposits are clay, silt, sand and gravel.

8.24 There are no designated archaeological assets present on the Site.

8.25 The Site lies within an Archaeological Priority Area as defined in the London Borough of Wandsworth's Development Management Policies Document.

8.26 There are three archaeological assets recorded within the Site on the HER:

- A Palaeolithic handaxe is recorded at the Site`s southwestern boundary with Richmond Park;
- An 18th century circular garden temple associated with Manresa House is recorded at the Site`s northeastern boundary;
- The extant 1960s buildings of Allbrook House and Roehampton Library are recorded in the eastern portion of the Site.

8.27 The potential for archaeological remains to be encountered within the Site is summarised in Table 8.4 below and discussed in full in the Desk-Based Assessment (Appendix 8.1).

Table 8.4 Summary of archaeological potential

Period	Potential	Explanation of potential
Palaeolithic and Mesolithic	Low	The distribution of Palaeolithic and Mesolithic artefacts within the study area is sparse. The site`s unsuitable geological profile and lack of nearby water source contributes to the low potential.
Neolithic	Low	Neolithic evidence from the study area is very sparse.
Bronze Age / Iron Age	Moderate	Evidence of Bronze Age/Iron Age occupation activity is recorded from archaeological investigations in the vicinity of the Site.
Roman	Low	No finds or features of Roman date have been identified within the 1km study area search radius.
Anglo-Saxon	Low/Moderate	Limited evidence of Saxon occupation is recorded in the vicinity of the Site.
Medieval	Low/Moderate	The Medieval village of Roehampton is believed to have been located in the vicinity of the Site`s northeastern boundary, with the remainder of the Site likely comprising open ground/fields.
Post-Medieval and Modern	Low	A comprehensive map regression has shown that from at least the 16th century the Site predominantly formed agricultural and horticultural land with occasional buildings, before major development of the Alton West Estate in the 1950s.

8.28 The construction of the Alton Estate currently occupying the Site can be considered likely to have had a severe and widespread negative impact on below ground archaeological remains. Construction activities including terracing, the cutting/piling of foundations and services, roadways, landscaping and tree planting are likely to have truncated any archaeological remains previously present within the Site. This is supported by LiDAR data (see Appendix 8.1 Desk-Based Assessment) for the Site that shows no evidence of relict features associated with earlier land use or activity.

8.29 Agricultural and horticultural use of the Site prior to development of the modern estate can also be considered likely to have had a widespread, moderate archaeological impact.

8.30 Overall it would appear that while it is possible that archaeological remains of prehistoric, Anglo-Saxon and Medieval date may be present within the Site, the balance of probability is that these will be of local/low importance.

8.31 However, given the extent of Modern redevelopment across the Site since the potential deposition of such remains, it can be considered likely that any archaeological remains formerly present are likely to have been severely impacted by the previous phases of development.

Future Baseline

8.32 The baseline position would not be expected to change in the absence of the Development.

Likely Significant Effects

Construction Phase

8.33 This section identifies and assesses the likely effects on below ground archaeological heritage assets during construction of the Development. The potential effects, and the significance of the effects on the assets, are characterised in the absence of mitigation measures.

8.34 Works during the construction phase that include cutting/piling of foundations, construction of roads, installation of services and sub-surface water drainage (see Chapter 5 Construction Methodology & Phasing of this ES) could damage and destroy the archaeological resource at the Site.

8.35 The plans submitted for approval (see Figures accompanying Chapter 3 of this ES) would suggest that the magnitude of impacts from construction may have the potential to vary from **Major to Minor** on archaeological assets, in advance of any mitigation.

8.36 This assessment of the impact that construction effects may have is based on the knowledge regarding the Site's archaeological remains and assumed construction impacts, as set out above. Based on those assumed construction impacts the following impacts are considered likely:

Table 8.5 Assessment of Impacts

Construction Activity	Assessed Magnitude of Impact
Site set-up works, including contractors compound set-up and associated temporary services, levelling work and other preparatory groundworks	Minor
Construction, including foundation excavation or pile installation, service installation, road construction	Major
Landscaping, including ground reduction or levelling and creation of attenuation tanks and ponds	Minor to Moderate
Compression of buried remains from vehicle movement, construction of spoil tips, bunds or raised landscape areas	Minor

8.37 It has been concluded for the purpose of this assessment that where any below ground heritage assets are present within the Site and remain intact, these will be of **Low** importance.

8.38 It is considered likely the effects as a result of the construction activities will be **Adverse** in nature given the disturbance of the remains. These effects will be limited to the Site and will be permanent and irreversible.

8.39 Using the approach set out in the Assessment Methodology (calculation of effect on a particular asset is achieved by a combination of the importance of the heritage asset and the magnitude of impact on that asset) the following range of effects can be assessed:

- Major impacts on assets of Low importance are considered to have a Moderate Adverse effect before mitigation takes place;
- Moderate impacts on assets of Low importance are considered to have a Minor adverse effect before mitigation takes place;
- Minor impacts on assets of Low importance are considered to have a Minor adverse effect before mitigation takes place.

8.40 Prior to mitigation, the construction of the Development is therefore assessed as likely having a permanent **moderate to minor** adverse effect. Any potential archaeological remains within the Site are unlikely to survive the development process.

Operational Phase

8.41 This section identifies and assesses the likely effects on archaeological assets after the construction of the Development.

8.42 The Development, once completed, will not have any effect on archaeological remains as it has been assumed that the construction phase will have disturbed any remains as a result of excavation, earthworks and other below ground construction activities. Consequently, no additional physical effects will occur to below ground heritage assets during the operation phase.

Mitigation Measures

Construction Phase

8.43 The location and extent of any archaeological mitigation will be discussed and agreed with the LBW's Archaeological Advisors and would be secured by a pre-commencement planning condition. The scope and methodology of this will be subject to further method statements/Written Schemes of Investigation (WSI).

8.44 Based on the results of the baseline assessment it is recommended that an archaeological watching brief is in place during ground works. The watching brief would focus on areas outwith extant modern development, i.e. where less-than-major previous impacts are likely to have occurred on any surviving archaeology.

8.45 Should below ground heritage assets be found, work would stop and the remains archaeologically investigated and recorded in cognisance of the relevant WSI previously agreed with the LBW's archaeology advisor. This will ensure no harm to previously unidentified assets.

Operational Phase

8.46 No archaeological effects are anticipated at the operational stage and therefore no further mitigation measures are required.

Residual Effects

8.47 Residual effects are those that are predicted to remain after implementation of the mitigation measures described above. It is important to demonstrate that any measures included as part

of the mitigation package to respond to adverse effects can be delivered in practice, the measures correspond with planning policy and therefore there is confidence that they will be implemented.

Construction Phase

8.48 Table 8.6 below provides a summary of residual effects upon below-ground archaeology resulting from the construction phase of the Development after effective implementation of the additional mitigation measures. It is considered that the residual effect produced by mitigation could vary from minor beneficial to moderate beneficial, dependent upon the results of the work and the effect that such work has with regard to local / regional Research Objectives.

Table 8.6 Summary of Residual Effects

Asset	Mitigation Measures Proposed	Residual Effects
Palaeolithic and Mesolithic	Excavation and recording (preservation by record); public dissemination of results	minor beneficial to moderate beneficial
Neolithic	Excavation and recording (preservation by record); public dissemination of results	minor beneficial to moderate beneficial
Bronze Age / Iron Age	Excavation and recording (preservation by record); public dissemination of results	minor beneficial to moderate beneficial
Roman	Excavation and recording (preservation by record); public dissemination of results	minor beneficial to moderate beneficial
Anglo-Saxon	Excavation and recording (preservation by record); public dissemination of results	minor beneficial to moderate beneficial
Medieval	Excavation and recording (preservation by record); public dissemination of results	minor beneficial to moderate beneficial
Post-Medieval and Modern	Excavation and recording (preservation by record); public dissemination of results	minor beneficial to moderate beneficial

Operational Phase

8.49 No residual impacts upon below-ground archaeology resulting from the operational phase of the Development are anticipated.

Cumulative Effects

8.50 This section identifies and assesses the likely effects of the cumulative impacts from the development of surrounding sites on archaeological assets during the construction and operation phases, prior to the adoption of mitigation measures. The relevant surrounding scheme is Digby Stuart and Southlands Colleges, Roehampton Lane, SW15 (ref. 2014/3330), approved 13/10/2014.

8.51 There may be some cumulative impacts on archaeological receptors as a result of the interaction of the Development with the identified cumulative scheme. Indeed, it is acknowledged that any archaeological remains within the site form part of a wider archaeological landscape. However, given the isolated, small scale and localised nature of archaeological sites no significant cumulative effects are identified in relation to below ground archaeological remains arising from the construction and operational phases of the Development.

Summary

8.52 This chapter assesses the likely significant archaeological effects resulting from the Development.

8.53 The current baseline conditions are informed by an Archaeological Desk-Based Assessment, carried out in accordance with government policy, National Planning Policy Framework (NPPF), and the 'Standard and Guidance for Historic Environment Desk-Based Assessments' (Chartered Institute for Archaeologists 2014). The assessment draws together the available archaeological, historic, topographic and land-use information in order to clarify the archaeological interest of the Site.

8.54 There are no designated archaeological assets present on the Site.

8.55 The site lies within an Archaeological Priority Area as defined in the London Borough of Wandsworth's Development Management Policies Document.

8.56 The site is considered likely to have a moderate archaeological potential for the later Prehistoric and Anglo-Saxon periods. A moderate potential for Medieval assets is also assigned to the eastern and northeastern extents of the Site, which may have been located within the original settlement of Roehampton.

8.57 Past post-depositional impacts, particularly the construction of the Alton estate in the 1950s, are considered likely to have had a widespread, negative impact on any underlying archaeological deposits; as supported by LiDAR data for the Site.

8.58 Table 8.6 below contains a summary of the likely significant effects of the Development. Any archaeological assets present on the Site are considered likely to be of local/low importance. Plans submitted for planning approval would suggest that the impacts from construction will

vary from Major to Minor. Using this approach, the range of effects can be assessed to vary from a Moderate to Minor adverse effect prior to mitigation.

8.59 It is considered that mitigation requirements will focus on areas outwith extant modern development and should comprise a watching brief given the likelihood that any buried remains would be of low importance and have been heavily truncated by previous development. After the completion of the mitigation works, no significant adverse residual effects are identified and it is considered that the public dissemination of the results of mitigation works could produce a minor to moderate beneficial effect.

Table 8.7: Table of Significance – Archaeology

Potential Effect	**Nature of Effect** (Permanent/Temporary)	**Significance** (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	**Mitigation / Enhancement Measures**	**Geographical Importance***							**Residual Effects** (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Change to most or all key archaeological materials, such that the resource is totally altered.	Permanent	Moderate Adverse	Excavation and recording (preservation by record), public dissemination of archaeological data							x	Moderate to minor beneficial
Changes to many key archaeological materials, such that the resource is clearly modified	Permanent	Minor Adverse								x	Moderate to minor beneficial
Changes to key archaeological materials, such that the asset is slightly altered	Permanent	Minor Adverse								x	Moderate to minor beneficial
Completed Development											
None	n/a	n/a	n/a								
Cumulative Effects											
Construction											
Very minor changes to archaeological materials	Permanent	Negligible	Excavation and recording (preservation by record)							x	Negligible
Operation	n/a										
None	n/a	n/a	Public dissemination of archaeological data from construction phase							X	Moderate to minor beneficial

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

References

[1] DCLG (March 2012, revised February 2019) *National Planning Policy Framework (NPPF)*

[2] DCLG (March 2014) *National Planning Practice Guidance (PPG)*

[3] Historic England (July 2015) *Historic Environment Good Practice Advice in Planning: 1 The Historic Environment in Local Plans*

[4] Historic England (July 2015) *Historic Environment Good Practice Advice in Planning: 2 Managing Significance in Decision-Taking in the Historic Environment*

[5] Historic England (December 2017) *Historic Environment Good Practice Advice in Planning: 3 The Setting of Heritage Assets*

[6] *The London Plan (March 2016) The Spatial Development Strategy for London (consolidated with alterations since 2011)*

[7] The London Plan – The Spatial Development Strategy for Greater London, Draft for Public Consultation (December 2017) and Suggested Amendments (August, 2018)

[8] English Heritage (2008) *Conservation principles – policies and guidance for the sustainable management of the historic environment*

[9] Highways Agency (2007) Design Manual for Roads and Bridges. Volume 11, Section 3, Part 2, I (HA 208/07)

[10] Chartered Institute for Archaeologists (2014) *Standard and Guidance for historic environment desk-based assessment*

[11] DCMS 2013 *Scheduled Monuments & nationally important but non-scheduled monuments*

[12] *Wandsworth Local Plan Development Management Policies Document* (adopted March 2016)

[13] *Wandsworth Local Plan Site Specific Allocations Document* (adopted March 2016)

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 9 Transport and Access

BARTON WILLMORE

9. TRANSPORT & ACCESS

Introduction

9.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of transport and access.

9.2 This chapter has been prepared by Arup. The assessment makes reference to the Transport Assessment (TA) appended as Volume 3 of the Environmental Statement (ES).

Policy Context

National Planning Policy

National Planning Policy Framework[i]

9.3 The NPPF was published in February 2019. The NPPF sets out the Government's planning policies for England and how these should be applied, providing a framework within which locally-prepared plans for housing and other developments can be produced.

9.4 Section 9 refers to the promotion of sustainable transport and states the transport system needs to be balanced in favour of walking, cycling, and public transport modes, giving people a real choice about how they travel. The environmental impacts of traffic and transport infrastructure can be identified, assessed and taken into account, including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains.

9.5 Within the NPPF, para 109 states 'Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe.

Planning Practice Guidance (2014)[ii]

9.6 The PPG was launched on 6th March 2014 and provides an internet based source of all national planning guidance. In the section relating to Travel Plans, Transport Assessments and Statements, the PPG defines these documents as ways of assessing and mitigating the negative transport impacts of development in order to promote sustainable development. It states that an assessment should include the likely associated

environmental impacts of transport related to the Development, particularly in relation to proximity to environmentally sensitive areas as well as an appropriate assessment of the cumulative impacts arising from other committed development.

Strategic Planning Policy

London Plan (2016)[iii]

9.7 The London Plan recognises that transport plays a fundamental role in addressing the whole range of spatial planning, environmental, economic and social policy priorities. Policy 6.3, regarding the effects of development on transport capacity, states that new developments which will give rise to significant numbers of new trips should be located either where there is already good public transport provision with capacity adequate to support the additional demand, or where such high-quality provision is being introduced. Phasing development, the use of Travel Plans may help reduce the impact of the development. Policy 6.10, relating to walking, states that development proposals should ensure high quality pedestrian environments and emphasise the quality of the pedestrian and street space.

Draft New London Plan (2018)[iv]

9.8 The draft new London Plan was issued for consultation in November 2017 and suggested minor changes published in August 2018. As such, this document is not currently adopted policy, although it is a material planning consideration. The document aims to ensure that London's transport is easy, safe and convenient for everyone, and encourages the use of cycling, walking and public transport. The Mayor's key target, as set out in Policy T1 is that 80% of all trips in London are to be made by foot, cycle or public transport by 2041. Policy T2 outlines that development proposals should demonstrate how they will deliver improvements in line with the Healthy Streets approach. Policy T4 states that development proposals should reflect and be integrated with current and planned transport access, capacity and connectivity.

Local Planning Policy

Wandsworth Local Plan Core Strategy (2016)[v]

9.9 The Wandsworth Local Plan Core Strategy sets out the Borough's approach to planning for future transport needs in Policy PL3. It states that the Borough will support

improvements to public transport, safeguard land for future transport needs where necessary, improve cycling and walking conditions and support sustainable development.

9.10 Specifically relating to Roehampton, Policy PL15 outlines the comprehensive regeneration of the Alton Estate including improved housing, improved retail and community space, improved employment, environmental improvements including safety improvements, improved transport links to Barnes Station, Queen Mary's hospital, Roehampton University and Richmond Park.

Wandsworth Local Plan Development Management Policies Document (2016)[vi]

9.11 In policy DMT1 The Wandsworth Local Plan Development Management Policies Document supports development which takes up opportunities for sustainable transport, provides safe and suitable access for all, and which undertakes improvements which cost effectively limit significant impacts. The document also supports the production of Transport Assessments and Travel Plans to support development.

Wandsworth Local Plan Roehampton SPD (October 2015)[vii]

9.12 Core Principle 7 within the Wandsworth Local Plan Roehampton SPD addresses the improvement of access and connections associated with the Alton Estate regeneration. This includes new pedestrian and cycle connections, improvement to existing routes, and appropriate mitigation to highway and public transport networks.

Assessment Methodology

Establishing Baseline Conditions

9.13 Baseline conditions relevant to this assessment have been prepared on both a qualitative and quantitative basis, by means of desktop research, site visits and surveys, including the following:

- A series of Automatic Traffic Count (ATC) surveys and Manual Turning Count (MCC) surveys were conducted around the Site in June 2017;
- Personal Injury Accident (PIA) data was provided by Transport for London (TfL) for the latest three year period for all roads within the vicinity of the Site;
- A review of bus and National Rail service frequencies;
- A review of pedestrian and crossing facilities from the Site to local public transport

nodes (bus stops and rail stations), together with a review of the local pedestrian and cycle network;
- A review of local policy proposals; and
- A review of committed development proposals.

Identified receptors and their sensitivity

9.14 The potential receptors are those people making journeys within the study area for each mode and include:

- Pedestrians;
- Cyclists;
- Bus passengers; and
- Car drivers.

9.15 The sensitivity of these receptors varies by location and is reflected in the assessment of effects.

Assessment Methodology

9.16 The methodology gives strong regard to the IEMA (1993)[viii] guidance which states in paragraph 4.5:

- *"…For many effects there are no simple rules or formulae which define thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible…"*

Sensitivity of Receptors

9.17 The potential receptors are those people making journeys within the relevant study area for each mode. For each effect to be assessed, receptors are identified in each study area. The sensitivity of receptors have been defined as follows:

- Low: receptors which are lightly used (by all users or particularly by vulnerable road users) relative to other receptors within the study area or those which have a high capacity to accommodate change without significant effects arising;
- Moderate: receptors which are used (by all users or particularly by vulnerable road

users) to an average level relative to other receptors within the study area or those which have a moderate capacity to accommodate change without significant effects arising; and

- High: receptors which are heavily used (by all users or particularly by vulnerable road users) relative to other receptors within the study area or those which have a low capacity to accommodate change without significant effects arising.

Magnitude of Change

9.18 For each effect to be assessed, criteria for assessing magnitude of change will be defined as follows:

- Negligible: changes which are unlikely to be perceptible;
- Minor: changes which are likely to be perceptible but not the extent that it would materially change conditions which would otherwise prevail;
- Moderate: changes which are likely to be perceptible and which would materially change conditions which would otherwise prevail to the extent that it may affect travel behaviour to some degree; and
- Major: changes which are likely to be perceptible and which would significantly change conditions which would otherwise prevail to the extent that it would significantly affect travel behaviour.

Magnitude of Significance

9.19 The Magnitude of Significance (defined in chapter 2 of this ES and provided in Table 9.1 below for ease of reference) is determined through the combination of Sensitivity of Receptor and Magnitude of Change. Effects are described as major, moderate, minor or negligible.

Table 9.1: Methodology for Assessing Significance

Magnitude	Sensitivity High	Moderate	Low
Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
Moderate	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial
Minor	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
Negligible	Negligible	Negligible	Negligible

9.20 Effects can also be described, for example, as:

- International, national, regional or local level importance
- Beneficial or adverse;
- Permanent or reversible; and
- Short, medium or long term.

9.21 Note that moderate and major effects are considered to be 'significant' in EIA terms.

Assessment Scenarios

9.22 The existing scenario (Scenario 1) is the conditions which are prevailing at the present time, as described in the Baseline Conditions section of this chapter.

9.23 The do minimum/future base scenario (Scenario 2) is the reference scenario against which the potential effects of the Development are assessed in the future design year. This includes Scenario 1 plus any changes which are committed to take place to existing conditions by the future design year. This is the scenario against which the potential effects of the Development are assessed. The IEMA (2004)[ix] guidance sets out some context in section 10.3 as follows.

- *"It is often assumed that the environmental baseline for a proposed development is necessarily the status quo and use this as the baseline for assessment without any apparent consideration of whether this is wholly correct."*
- *"…The environmental baseline is constantly changing, irrespective of the development under consideration."*
- *"…It is because of these complications that it is important to establish a 'do nothing', future scenario as the environmental baseline. The 'do nothing' scenario comprises the predicted environmental conditions that would exist, in the absence of the particular development under consideration."*
- *"Establishing the 'do nothing' scenario raises the issue of making a choice as to what changes should be included or excluded from the future baseline…"*
- *"The determination of a future 'do nothing' scenario will rarely be an entirely objective, straightforward process. There may be uncertainty as to what future conditions, in the absence of the development, would be. Inevitably, judgements may have to be made based on certain assumptions…"*

9.24 The cumulative schemes were identified as part of the ES scoping discussions. Relevant Transport Assessments have been used to understand likely significant effect on existing conditions within the study area. Only Digby Stuart and Southlands Colleges (2014/3330)

has been explicitly accounted for after that review with others being excluded due to size, nature and location. Further details on the cumulative schemes considered in the assessment is provided in chapter 2 of the ES.

9.25 The do something / future base + development scenario (Scenario 3) is Scenario 2 plus the Development in the future design year. This scenario is considered for both operation and for construction of the Development.

Scope of Assessment

9.26 The 'Guidelines for the Environmental Assessment of Road Traffic, IEMA, 1993' sets out a number of potential environmental impacts which may require assessment. Those which relate to this assessment are:

- Severance;
- Delay;
- Amenity;
- Fear and Intimidation;
- Accidents and Safety; and
- Hazardous Loads.

9.27 Amenity and Fear and Intimidation can be considered together as they are strongly interrelated.

9.28 An initial scope for assessment was agreed through the EIA scoping process (refer to chapter 2). This scope has been reviewed in the context of the fully developed scheme proposals and the outcomes of the TA (ES Volume 3) and revised as appropriate. This is summarised in Table 9.2.

Table 9.2: Transport and Access Effects

Potential Effect	Construction	Operation
Severance	*	*
Driver and Bus Delay	Qualitative assessment of potential delay to drivers and buses arising from temporary works during construction	Qualitative assessment of potential driver/bus delay at junctions on Roehampton Lane informed by TA modelling and of delays to bus users from additional demand for travel by bus
Pedestrian and cycle delay	Qualitative assessment of potential delay to pedestrians and cyclists arising from temporary works during construction	*

Amenity, fear and intimidation	*	Qualitative assessment of amenity, fear and intimidation associated with improved pedestrian and cyclist environment and routes on the Site
Accidents and Safety	*	*
Hazardous loads	*	*

* Significant effects considered unlikely so assessment has been scoped out

7.1 The rationale for this scope of assessment is described in the EIA Scoping Report (Appendix 2.1) and summarised below:

- Severance:
  - Construction vehicles are expected to arrive at the site via Danebury Avenue from Roehampton Lane. Given the relatively high level of traffic on these streets, and their nature (Roehampton Lane forming part of the TfL Road Network and Danebury Avenue being a bus route and the main spine accommodating vehicular access to Alton Estate) these roads are not particularly sensitive to short term construction severance. Severance is therefore scoped out for the construction stage assessment; and
  - The Development is not expected to result in significant changes which could affect perceptions of severance during operation. In terms of severance, the number of vehicle trips generated by the operational Development is expected to be imperceptible on the wider network. Therefore, assessment of severance is scoped out for the operation phase of the Development.
- Driver and Bus Delay
  - During construction, construction traffic is not expected to result in changes which could affect perceptions of driver/bus delay. Potential effects will arise from short term road works required to implement infrastructure improvement schemes. A qualitative assessment of driver/bus delay associated with road works is scoped in for the construction phase of the Development.
  - The Development could result in changes which could affect perceptions of driver/bus delay during operation if junctions exceed capacity. A detailed quantitative assessment of junction capacity and delay is included in the TA (ES Volume 3) and a qualitative assessment based on that data in scoped in for the operation phase of the Development; and
  - The Development could also result in changes which could affect perceptions of driver/bus delay during operation if bus services exceed, or further exceed, capacity. Through the planning application process, engagement between TfL and the Applicant will identify a suitable level of funding to mitigate impacts on bus services, should this prove necessary, informed by the assessment included in the TA (ES Volume 3). A qualitative assessment of this is therefore scoped in for the operation phase of the Development.
- Pedestrian and Cyclist Delay

  - During construction, it may be necessary to temporarily close some pedestrian only routes in order to construct the Development (including improved pedestrian routes). A qualitative assessment of this potential effect has been scoped in for the construction phase; and
  - Through the introduction of new pedestrian routes, the Development may result in significant effects in terms of pedestrian delay during operation and is therefore scoped in.
- Amenity, Fear and Intimidation
  - During construction, the Development is not expected to result in changes which could affect perceptions of amenity, fear and intimidation. The change in HGV activity relative to the baseline is unlikely to be perceptible. Amenity, fear and intimidation is therefore scoped out for the construction stage assessment.
  - The Development could result in significant beneficial changes which could affect perceptions of amenity, fear and intimidation during operation. The design of the Development and the pedestrian routes within it can be expected to be designed to create an attractive and secure environment. A qualitative discussion of Amenity, Fear and Intimidation will be included within the ES chapter for the assessment of the Development in operation.
- Accidents and Safety
  - During construction, the Development is not expected to result in changes which could affect accidents and safety. Traffic changes arising from the construction of the Development will be low and unlikely to be perceptible relative to baseline conditions. Accidents and safety is therefore scoped out for the construction stage assessment; and
  - The Development is not expected to result in changes which could affect accidents and safety during operation. Any changes arising from activity generated by the site is likely to be negligible. Any effects arising from highway and public realm schemes proposed as part of the Development are likely to be negligible or slightly beneficial. Accidents and safety is therefore scoped out of the operational stage assessment.
- Hazardous Loads
  - Hazardous loads could include, for example: Explosives; Gases; Flammable liquid; Flammable solids; Oxidising substances; Toxic substances; Radioactive material; and Corrosive substances. The Development is not expected to generate or attract hazardous loads during either construction or operation (beyond standard construction materials) and hazardous loads is therefore scoped out.

Study Area

9.29 The study area includes:

- The Site;

- Roehampton Lane; and
- Bus within 560m of the Site.

Limitations and Assumptions

9.30 All future forecasts include a degree of uncertainty. The assessors have taken appropriate account of the reasonably conceivable uncertainty when assessing potential likely significant effects.

9.31 The outcomes of public transport capacity assessment and the required mitigation cannot be determined prior to application submission and further engagement with TfL. It has been assumed for the purposes of this assessment that, if a potentially significant impact were to be identified through that process that a suitable mitigation package (in the form of a financial contribution) would be secured. This is the normal course for a major planning application.

9.32 Detailed construction proposals for highway works are not yet available (including temporary traffic control plans). The assessors have made appropriate assumptions about likely approaches to construction and traffic management and considered alternatives where necessary.

Baseline Conditions

Current baseline

Highway network

9.33 Roehampton Lane (A306) lies adjacent to the site to the east and connects to the A3 in the south and the A205 South Circular Road to the north; all three of these roads are part of the TfL Road Network (TLRN). Vehicular access to the site is taken from the junctions of Danebury Avenue and Kingsclere Close with Roehampton Lane. The Danebury Avenue junction takes the form of a signal controlled cross roads (with the opposing arm being exit only) while the Kingsclere junction is a simple priority T-junction.

9.34 The regeneration area is permeated by a network of existing streets. Some parts of this network are adopted as highway while others are maintained as private roads, though most private roads are also under the control of London Brough of Wandsworth (LBW). Danebury Avenue forms the main spine through the regeneration area from its junction

with Roehampton Lane and carries two bus routes. Harbridge Avenue and Laverstoke Gardens sit parallel to Danebury Avenue. North of Harbridge Avenue, Ellisfield Drive connects to Kingsclere Close and then forms a junction with Roehampton Lane.

9.35 Traffic Surveys were undertaken in June 2017 to inform the assessment. As part of the TLRN, Roehampton Lane carries the greatest volume of traffic at some 2,200 vehicles per hour in the peak periods. Other streets are more modestly trafficked with relatively low volumes. Danebury Avenue carries some 3-400 vehicles in peak hours, Holybourne carries some 170 vehicles per hour and other streets carry 100 vehicles per hour or less.

Pedestrian and cycle facilities

9.36 Roehampton Lane is part of the TLRN and has the potential to create a degree of severance for east-west movements. However, a number of controlled and uncontrolled crossing points are provided at and between junction.

9.37 Pedestrian permeability within the Alton Estate intervention area is strong in and east-west direction via the existing street network. Pedestrian permeability in a north-south direction is restricted by topography and the current built form (and street network).

9.38 Danebury Avenue is an important route for cyclists connecting Richmond Park eastwards towards Putney and the South Circular. The Roehampton Gate of Richmond Park leads through the park to the south and west towards Kingston and Richmond. The connection towards the South Circular connects with Putney High Street and Putney Bridge, as well as Cycle Superhighway 8 towards central London.

9.39 The junction of Danebury Avenue with Roehampton Lane has recently been upgraded by TfL to provide improved facilities for cyclists. This was associated with the proposed Quietway from Wandsworth Common to Teddington.

Public transport network

9.40 TfL's online WebCAT tool shows the Site as having a PTAL ranging from 2 to 3 with the majority of the intervention area falling within a PTAL 3 (moderate). TfL's online WebCAT tool shows the Site as being accessible to central London within 45-60 minutes.

9.41 The most easily accessible London Underground stations are East Putney (District [Wimbledon Branch]) (c.2.7km) and Hammersmith (District [Richmond & Ealing Broadway branches], Hammersmith & City, Circle and Piccadilly) (c.5.5km). Southfields (c.3.2km)

also provides access to the same branch of the District line as East Putney but lies within zone 3 while East Putney lies in both zones 2 and 3 and Hammersmith lies in zone 2. The most easily accessible National Rail stations are Putney (c.2.4km) and Barnes (c.2.0km). Barnes provides access to the same line as Putney but lies within zone 3 while Putney lies in both zones 2 and 3.

9.42 Bus routes 170, 430 and N74 run through and terminate within the Site. Three pairs of bus stops are provided on Danebury Avenue with a 'bus turnaround' facility at the junction of Minstead Gardens and Danebury Avenue. Buses currently stand on Danebury Avenue after turning.

9.43 Bus routes 72, 265 and 493 also pass the Site and are available from stops on Roehampton Lane with bus route 85 available from Alton Road or Medfield Street.

Future Baseline Conditions

Current baseline

Highway network

9.44 Through preapplication consultation, TfL recommended that traffic modelling allow for a six percent increase in traffic flow in the northbound direction on Roehampton Lane in the AM peak hour. This has been adopted for the assessment but it must be highlighted that this is based on TfL's Highway Assignment Model (HAM) data for which there is no current Mayors Transport Strategy[x] (MTS) scenario.

9.45 The aim of the MTS is for 80% of all journeys in London to be conducted on foot, cycle or public transport by 2041, this would correspond with a reduction in car use. With this strategy, it is anticipated that an additional 16% of trips would need to be changed from car to walk, cycle and public transport to achieve this target.

Pedestrian and cycle facilities

9.46 TfL are currently implementing schemes to deliver a Quietway between Wandsworth and Teddington. This would run along Danebury Avenue and provide improved cycle access between the Site and Teddington Station and in the direction of Southfields station.

Public transport network

9.47 While there are no firmly defined proposed improvements to public transport, the Mayors Transport Strategy (MTS) sets out TfL's approach to managing and enhancing London's public transport networks to accommodate future growth. In particular, the MTS identifies Roehampton Lane as a route on which bus services will be focused and where high-quality bus priority can be provided, ensuring reliable and quick services.

Likely Significant Effects

Development Travel Demand

9.48 The TA (refer to ES Volume 3) heavily informs the assessment of likely significant effects. In particular, the trip generation of the Development is a useful reference to understand the scale of change of movement as a result of the Development. This is summarised in Table 9.3.

Table 9.3: Transport and Access Effects

Mode	AM			PM		
	In	Out	Total	In	Out	Total
Total People	**128**	**511**	**638**	**299**	**157**	**455**
Pedestrians	40	162	202	93	49	142
Public Transport Users	51	203	253	96	51	147
Bus/Tram Passengers	37	147	184	79	41	120
Total Rail Passengers	14	55	69	17	9	26
Cyclists	4	17	22	12	6	19
Vehicle Occupants	32	129	161	97	51	148
Vehicles	**23**	**92**	**115**	**70**	**37**	**107**
Taxis	2	3	4	4	2	7
Cars	13	80	93	55	24	79
Motor Cycles	1	4	5	4	1	5
OGVs	4	4	7	2	2	4
LGVs	4	2	5	5	7	13

Embedded Mitigation

9.49 The Development has been designed, and the application has been made, with a number of embedded mitigation measures. These form part of the planning application rather being elements which will be secured by planning condition or s106. These include:

- Junction Capacity enhancement at Danebury Avenue/ Roehampton Lane;
- Street environment enhancement on Danebury Avenue, Harbridge Avenue, Kingsclere Close, Ellisfield Drive and Laverstoke Gardens;
- Additional bus stop and new bus stands on Danebury Avenue (west of the main

intervention area);

- Improved pedestrian crossing facilities on Danebury Avenue; and
- s37/s38/s278 (of the Highways Act[xi]) agreements to secure appropriate working methods for highway works including traffic management arrangements.

Construction Phase

Driver & Bus Delay

9.50 Driver and bus delay may be affected by road works associated with junction and street works (and any associated closures or traffic management). It is anticipated that appropriate works can be undertaken without requiring day time road closures.

9.51 In particular, bus services have the potential to be significantly adversely affected should any road closures be required on Danebury Avenue as buses serve this route 24 hours. These potential effects would be minimised through the s37/s38/s278 agreement processes (which, similar to building regulations, is a legal requirement under UK law when undertaking any works on the highway and does not need to be secured by planning condition or s106). Approval of any road closures will be in subject to LBW (and TfL as consultees) being satisfied that any impacts on driver and bus delay are not significantly adverse after mitigation.

9.52 It is anticipated that the Development and associated highway works can be constructed without full road closures but with part closures with traffic management. The introduction of traffic management is likely to result in a perceptible affect for drivers and buses.

9.53 In the context of driver and bus delay, Roehampton Lane is a high sensitivity receptor by virtue of it being part of the TLRN (serving a strategic function) and carrying a significant volume of traffic including buses. Danebury Avenue is a moderate sensitivity receptor by virtue of its importance as the main access into the Alton Estate (serving an estate wide function) and its function as a bus route. All other roads within the intervention area and subject to redevelopment are low sensitivity as they serve a more local (street level) function.

9.54 Roehampton Lane is unlikely to be materially affected by temporary works associated with junction reconstruction as works are limited to the Danebury Avenue side arm and any changes are in the context of the roads strategic function carrying longer distance

journeys. With appropriate traffic management and working control secured through s37/s38/s278 agreements, the magnitude of change is likely to be minor. The significance is therefore a short-term, reversible, local effect of moderate to minor adverse significance.

9.55 Danebury Avenue will be subject of short-term construction works to implement the Roehampton Lane junction improvements and the Danebury Avenue parking and servicing enhancements. The works to Danebury Avenue have the potential to perceptibly affect driver and bus delay. The magnitude of this effect is likely to be moderate as delays are likely to be perceptible and may affect driver behaviour giving rise to a short-term, reversible, local effect of moderate to minor adverse significance.

9.56 During construction works and while temporary traffic management is in place, other streets (Harbridge Avenue, Kingsclere Close, Ellisfield Drive and Laverstoke Gardens) are likely to experience a minor magnitude of change as delays are likely to be perceptible but the relatively low flow is unlikely to result in material change to driver behaviour. This gives rise to a short-term, reversible, local effect, of minor adverse to negligible significance.

Pedestrian & Cyclist Delay

9.57 All those streets subject to road works have the potential to result in some short-term changes to pedestrian routes. However, it is not anticipated that any pedestrian routes would need to be fully closed to accommodate construction.

9.58 The sensitivities of the relevant receptors are consistent with their sensitivities to driver and bus delay (that is: Roehampton Lane is a high sensitivity receptor; Danebury Avenue is a moderate sensitivity receptor; and all other roads within the intervention area and subject to redevelopment are low sensitivity).

9.59 As pedestrian routes are expected to be kept open during construction (with appropriate phasing and traffic management secured through s37/s38/s278 agreements), the magnitude of change in all cases is likely to be negligible giving rise to a negligible effect.

Operational Phase

Driver & Bus Delay

9.60 Driver and bus delay is considered quantitatively in chapter 24 of the TA (ES Volume 3) for the operation phase of the Development. This assessment finds that the in-built impact minimisation measures (in the form of the proposed junction and street works) maintains acceptable junction performance across the network.

9.61 The sensitivities of the relevant receptors are consistent with their sensitivities to driver and bus delay during construction (that is: Roehampton Lane is a high sensitivity receptor; Danebury Avenue is a moderate sensitivity receptor; and all other roads within the intervention area and subject to redevelopment are low sensitivity). However, in the context of the imperceptible change in delay, the magnitude of change is negligible and therefore the significance is negligible.

9.62 The local bus network is understood to be well used and, while existing capacity and demand data has not been provided by TfL, the sensitivity of the network is estimated to be of a high sensitivity. The addition of Development trips onto the bus network has the potential to perceptibly affect perceptions of delays for travel by bus with the potential to change travel behaviour to some degree. This has the potential to give rise to a local effect of major to moderate adverse significance, subject to engagement with TfL.

Pedestrian Amenity, Fear & Intimidation

9.63 The proposed street works and new routes created between blocks will improve the quality of the environment for pedestrians. On existing streets the Development will deliver increased and regularised footway widths, additional street trees and reduced risk of parked vehicles mounting kerbs. The Development will also create new routes (largely running north-south while most existing routes run east-west) in traffic free courtyard environments. All routes, existing and new, will be subject together overlooking offering improved passive surveillance.

9.64 Given the importance of foot travel locally, both as a final mode and as an intermediate mode to and from bus stops, the importance of the existing and new routes is, overall, moderate. The scale of the benefit (magnitude of change) of the new routes and improved environment is moderate given the potential for people to change their routes and overall increase in relative pleasantness of the journey. This gives rise to a local effect of moderate to minor beneficial significance.

Mitigation Measures

9.65 The following mitigation measures have been identified as mitigation measures and would be secured by condition or by s106. These include:

- A Travel Plan;
- A Construction Logistics Plan;
- A Car Parking Management Plan;
- A Delivery and Servicing Management Plan;
- Development Phasing Plan;
- A s106 agreement to secure suitable financial contributions towards public transport networks where mitigation is found to be necessary; and
- Traffic regulation orders to control parking where appropriate.

Residual Effects

Construction Phase

Driver & Bus Delay

9.66 The mitigation measures will not change the significance of the effects and these remain as follows:

- Roehampton Lane - short-term, reversible, local effect of moderate to minor adverse significance;
- Danebury Avenue – short-term, reversible, local effect of moderate to minor adverse significance; and
- Harbridge Avenue, Kingsclere Close, Ellisfield Drive and Laverstoke Gardens – short-term, reversible, local effect, of minor adverse to negligible significance.

Pedestrian & Cyclist Delay

9.67 The mitigation measures will not change the significance of the effects and these remain as follows:

- Pedestrian routes – negligible effect.

Operational Phase

Driver & Bus Delay

9.68 The mitigation measures will not change the significance of the effects for vehicle delay and this remains as follows:

- Vehicle delay – negligible effect.

9.69 A contribution towards enhanced bus services (secured through s106) if required following engagement with TfL will secure sufficient additional capacity (if required) to accommodate the additional demand arising from Development. This will have the beneficial effect of reducing the magnitude of change for driver and bus delay during the operational phase to negligible and therefore resulting in a negligible effect.

Pedestrian Amenity, Fear & Intimidation

9.70 The mitigation measures will not change the significance of the effects and these remain as follows:

- Routes within and through the Site – local effect of moderate to minor beneficial significance.

Cumulative Effects

9.71 Cumulative schemes are included within the main assessment and therefore no further effects are unchanged relative to the likely significant effects in the main assessment.

Summary

9.72 The assessment of transport effects has been informed by traffic surveys undertaken in June 2017, a desktop review of transport data including accident statistics and public transport service information, reviews of assessments of committed schemes and engagement with stakeholders. The assessment has been undertaken in the context of guidance from the Institute of Environmental Management & Assessment (IEMA) on the assessment of transport related impacts and in the context of the Transport Assessment prepared in support of the planning application.

9.73 Roehampton Lane (A306) lies adjacent to the Site to the east and connects to the A3 in the south and the A205 South Circular Road to the north. Vehicular access to the Site is taken from the junctions of Danebury Avenue and Kingsclere Close with Roehampton Lane. The regeneration area is permeated by a network of existing streets. Danebury Avenue forms the main spine through the regeneration area from its junction with Roehampton Lane and carries two bus routes. A number of controlled and uncontrolled crossing points are provided across Roehampton Lane at and between junctions.

9.74 Danebury Avenue is an important route for cyclists connecting Richmond Park eastwards towards Putney and the South Circular. The junction of Danebury Avenue with Roehampton Lane has recently been upgraded by TfL to provide improved facilities for cyclists. TfL's online WebCAT tool shows the Site as having a PTAL ranging from 2 to 3 with the majority of the intervention area falling within a PTAL 3 (moderate). Bus routes 170, 430 and N74 run through and terminate within the Site while bus routes 72, 85, 265 and 493 also pass the Site.

9.75 The likely significant effects arising from the Development during construction are associated with temporary works to streets and junctions to provide improved junction performance and streetscape including pedestrian routes. In particular and in terms of driver and bus delay, Roehampton Lane and Danebury avenue are found to experience a short-term, reversible, local effect of moderate to minor adverse significance while other streets subject to improvement are found to experience a short-term, reversible, local effect of minor adverse to negligible significance. This arises due to short-term traffic control during road works.

9.76 During operation of the Development, the improved streetscape and new pedestrian routes will have a local effect of moderate to minor beneficial significance. This is due to the improved surfacing, enhanced street scene, reduced risk of footway parking and introduction of street trees as well as the creation of new routes.

9.77 During operation of the Development, there is potential for the additional demand on the local bus network to result in a local effect of major to moderate adverse significance in terms of bus delay. A suitable mitigation funding package will be secured through the s106 if the additional demand arising from the Development is found to require additional bus services. This mitigation will offset the effect of the Development on bus delay resulting in a negligible residual effect.

9.78 Table 9.4 contains a summary of the likely significant effects of the Development.

Table 9.4: Table of Significance – Transport and Access

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Driver & Bus Delay	Temporary	Moderate-Minor Adverse	Construction Logistics Plan							*	Moderate-Minor Adverse
Pedestrian & Cyclist Delay	Temporary	Negligible								*	Negligible
Completed Development											
Driver & Bus Delay	Permanent	Major-Moderate Adverse	S106 bus service enhancement contribution if required; Travel Plan; Delivery and Servicing Management Plan							*	Negligible
Pedestrian Amenity, Fear & Intimidation	Permanent	Moderate Beneficial	Travel Plan; Delivery and Servicing Management Plan							*	Moderate Beneficial
Cumulative Effects											
Construction											
Driver & Bus Delay	Temporary	Moderate-Minor Adverse	Construction Logistics Plan							*	Moderate-Minor Adverse
Pedestrian & Cyclist Delay	Temporary	Negligible								*	Negligible
Operation											
Driver & Bus Delay	Permanent	Major-Moderate Adverse	S106 bus service enhancement contribution if required; Travel Plan; Delivery and Servicing Management Plan							*	Negligible
Pedestrian Amenity, Fear & Intimidation	Permanent	Moderate Beneficial	Travel Plan; Delivery and Servicing Management Plan							*	Moderate Beneficial

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

REFERENCES

[i] CLG (February 2019) *National Planning Policy Framework*
[ii] CLG (March 2014) *Planning Practice Guide*
[iii] Mayor of London (March 2016) *The London Plan*
[iv] Mayor of London (December 2017) *Draft New London Plan*
[v] LB Wandsworth (March 2016) *Wandsworth Local Plan Core Strategy*
[vi] LB Wandsworth (March 2016) *Wandsworth Local Plan Development Management Policies Document*
[vii] LB Wandsworth (October 2015) *Wandsworth Local Plan Roehampton SPD*
[viii] IEMA (1993) *Guidelines for the Environmental Assessment of Road Traffic*
[ix] IEMA (2004) *Guidelines for Environmental Impact Assessment*
[x] Mayor of London (March 2018) *Mayors Transport Strategy*
[xi] Act of Parliament (1980) *The Highways Act (As amended)*

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 10 Air Quality

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10. AIR QUALITY

Introduction

10.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of Air Quality.

10.2 The Development has the potential to adversely affect air quality during both the construction phase and operational phase. The main air pollutants of concern related to construction are dust and particulate matter (PM_{10}), whilst for road traffic they are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$). For habitats, the main pollutants of concern from road traffic emissions are oxides of nitrogen (NO_x), with the consequential nitrogen and acid deposition.

10.3 This chapter describes: the assessment methodology; the baseline conditions at the Site and surroundings; the likely significant environmental effects; the mitigation measures required to prevent, reduce or offset any significant adverse effects; the likely residual effects after the mitigation measures have been employed, and the likely cumulative effects in conjunction with committed developments.

10.4 The Development includes an energy centre. Detailed design measures such as limiting emission concentrations and the provision of a suitable stack height to disperse emissions are readily available and will be used to ensure that no significant effects would arise from energy centre emissions. The equipment used will also comply with the emissions standards included in the SPG on Sustainable Design and Construction, and detailed in Appendix 10.2. As insufficient details are available regarding the type and size of the equipment to be used at this stage, it is recommended that a suitably worded condition be applied to the planning permission for the Development requiring an assessment of the energy centre impacts to be carried out at the detailed design stage.

Policy Context

National Planning Policy Framework (February 2019)[i]

10.5 The revised National Planning Policy Framework (NPPF) was published in February 2019 and supersedes previous national planning guidance. The NPPF notes that planning policies should sustain compliance with and contribute towards European Union (EU) limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas

(AQMAs) and the cumulative impacts on air quality from individual sites in local areas. It also states that planning decisions should ensure that any new development in an AQMA is consistent with the local air quality action plan.

Planning Practice Guidance[ii]

10.6 National Planning Practice Guidance (PPG) has been developed in order to support the NPPF. The guidance provides a concise outline as to how air quality should be considered in order to comply with the NPPF and states when air quality is considered relevant to a planning application, which includes when the proposals:

- *"Significantly affect traffic in the immediate vicinity of the Proposed Development site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads";*
- *"Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; or extraction systems (including chimneys) which require approval under pollution control legislation or biomass boilers or biomass-fuelled CHP plant; centralised boilers or CHP plant burning other fuels within or close to an air quality management area or introduce relevant combustion within a Smoke Control Area';*
- *"Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality"; and*
- *"Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations".*

Strategic Planning Policy

London Plan (2016)[iii]

10.7 The London Plan Consolidated with Alterations since 2011 provides strategic planning guidance for Greater London[iii]. Each Borough's development plans must be in 'general conformity' with it.

10.8 The Plan includes Policy 7.14 (Improving Air Quality) which states that development proposals should:

- Minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within AQMAs) and where development is likely

to be used by large numbers of people vulnerable to poor air quality, such as steps to promote greater use of sustainable transport modes;

- Promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the Greater London Authority and London Councils 'The control of dust and emissions from construction and demolition';
- Be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas designated as AQMAs);
- Ensure that where provision needs to be made to reduce emissions from a development, this is usually made on-site. Where this provision is demonstrated to be impractical or inappropriate, and that is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint-area based approaches; and
- Where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified.

10.9 Boroughs and others with relevant responsibilities should also have policies that:

- Seek reductions in levels of pollutants referred to in the Government's National Air Quality Strategy having regard to the Mayor's Air Quality Strategy; and
- Take account of the findings of the Air Quality Review and Assessments and Action Plans, in particular where AQMAs have been designated.

10.10 The Mayor will work with strategic partners to ensure the spatial, transport and design policies of the London Plan support his Air Quality Strategy.

10.11 The Plan also includes Policy 8.2 (Planning Obligations) which states that the Mayor will provide guidance for boroughs and other partners on the preparation of frameworks for negotiations on planning obligations reflecting strategic priorities including the improvement of Air Quality.

10.12 Supplementary Planning Guidance (SPG) on 'Sustainable Design and Construction'[iv] adopted in April 2014 forms part of the Implementation Framework for the London Plan. For air pollution, the Mayor's Priorities are stated as:

- Developers are to design their schemes so that they are at least 'air quality neutral';
- Developments should be designed to minimise the generation of air pollution;

- Developments should be designed to minimise and mitigate against increased exposure to poor air quality;
- Developers should select plant that meets the standards for emissions from combined heat and power and biomass plants set out in Appendix 7 (of the document); and
- Developers and contractors should follow the guidance set out in the SPG on 'The control of dust and emissions during construction and demolition'v when constructing their development.

10.13 The SPG on 'Sustainable Design and Construction' requires that air quality assessments are prepared for major developments where the development:

- Is located within an AQMA;
- Is likely to result in a new air pollution exceedance;
- Is located within 150 m of a sensitive receptor (schools, hospitals, care homes, nurseries, residential development);
- Will bring sensitive receptors into an area of poor air quality;
- Includes biomass boilers and/or combined heat and power; and
- Involves waste management/treatment activities, mineral extraction or any other general industrial combustion process.

10.14 For major developments that meet the above criteria, an air quality assessment is required to be submitted with the planning application and include:

- A review of air quality around the development site using existing air quality monitoring and/or modelling data;
- Air quality dispersion modelling data carried out in accordance with the London Councils Air Quality and Planning Guidance;
- An indication of the number of people (receptors) which will be exposed to poor air quality as a result of the development, and show their location on a map;
- An assessment of the impact on air quality during the construction phase and detailed mitigation methods for controlling dust and pollution emissions in line with the adopted SPG on 'The control of dust and emissions from construction and demolition';
- An outline and justification of mitigation measures associated with the design, location and operation of the development in order to reduce air pollution and exposure to poor air quality; and
- A maintenance regime for any combustion equipment or mitigation measures.

10.15 The SPG on 'Sustainable Design and Construction' provides guidance on:

- Minimising air quality emissions from location, transport, construction and demolition, and design and occupation;

- Protecting internal air quality;
- What is meant by 'air quality neutral';
- Emissions standards for combustion plant; and
- Offsetting provisions.

10.16 'Air quality neutral' applies across London as a whole and emission benchmarks have been proposed in terms of buildings' operation and transport emissions in order to meet these criteria. It is understood that the benchmark should be capable of being met without the need for significant additional mitigation. The emission benchmarks are summarised in Appendix 10.1.

10.17 Where individual and/or communal gas fired boilers are installed in commercial and domestic buildings they should achieve a NO_x rating of less than 40mgNO_x/kWh. If the particular combustion equipment is not known at the time of the planning application, developers are required to provide a written statement of their commitment and ability to meet the emissions standards within their Air Quality Assessments. Emissions standards are provided for solid and biomass boilers and CHP plants (see Appendix 10.2)

10.18 Where developments do not meet the air quality neutral benchmarks, it is suggested that appropriate on-site mitigation measures will be required to off-set any excess in emissions. Measures could include:

- Green planting/walls and screens;
- Upgrade or abatement work to combustion plant;
- Retro-fitting abatement technology for vehicles and flues; and
- Exposure reduction.

10.19 In addition, as part of the Implementation Framework for the London Plan, a SPG on 'The control of dust and emissions during construction and demolition'[v] was published in July 2014.

10.20 This SPG requires an 'Air Quality and Dust Risk Assessment' to be submitted at the time of a planning application; with an Air Quality and Dust Management Plan submitted prior to the commencement of works.

10.21 It also provides guidance for:

- The preparation of an 'Air Quality and Dust Risk Assessment' for construction and demolition activities, including air quality (dust) risk assessments;
- The stages of development the 'Air Quality and Dust Risk Assessment' is to cover include demolition, earthwork, construction stages and trackout (vehicles leaving the Site);

- The identification of the potential scale (large, medium, small) of dust emissions for each stage of work;
- The identification of the level of risk due to the scale of dust emissions on soiling (dirt), health and the natural environment, depending on the duration of the activities, their intensity, the prevailing meteorological conditions, the existing levels of background pollution and the sensitivity of receptors to dust;
- Best practice methods for controlling dust and pollution control on-site and to prevent trackout;
- Recommendations for monitoring low, medium and/or high-risk sites; and
- Early notification of new 2015 and 2020 standards for non-road mobile machinery.

Draft London Plan

10.22 The London Plan: The Spatial Development Strategy for Greater London (Draft London Plan)[vi] was published for public consultation in December 2017 and sets out the Mayor of London's overall strategic plan for London (Greater London Authority, 2017). The Draft London Plan runs from 2019 to 2041 in order to provide a longer-term view of London's development to inform decision making. Whilst still in draft, it is a material planning consideration.

10.23 On 13 August 2018 the Mayor published a version of the Draft New London Plan that includes clarifications, corrections and factual updates to the Consultation Draft Plan (Greater London Authority, 2018)[vii]. Policy Planning for Good Growth 3 on creating a healthy City states:
"To improve Londoners' health and reduce health inequalities, those involved in planning and development must:
… DB seek to improve London's air quality, reduce public exposure to poor air quality and minimise inequalities in levels of exposure to air pollution..."

10.24 The draft Plan includes Policy Sustainable Infrastructure 1 (SI1) Improving Air Quality which aims to:
"*ensure that new developments are designed and built, as far as is possible, to improve local air quality and reduce the extent to which the public are exposed to poor air quality. This means that new developments, as a minimum, must not cause new exceedances of legal air quality standards, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits".*

10.25 Policy SI1 Improving Air Quality continues and states:
"London's air quality should be significantly improved and exposure to poor air quality,

especially for vulnerable people, should be reduced:

1) Development proposals should not:

a) lead to further deterioration of existing poor air quality

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

c) reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality

d) create unacceptable risk of high levels of exposure to poor air quality.

2) Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality. Particular care should be taken with developments that are in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people.

3) Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should propose methods of achieving an Air Quality Positive approach through the new development.

3A) major development proposals must be at least air quality neutral and be submitted with an Air Quality Assessment.

4) Development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.

Point 5 removed

6) Development proposals should ensure that where emissions need to be reduced, this is done on-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated…"

10.26 Policy SI3 on Energy Infrastructure states:

"Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system

1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

a) connect to local existing or planned heat networks

b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required, and a lower temperature heating system)

e) use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network)

f) use ultra-low NO_x gas boilers.

2) CHP and ultra-low NO_x gas boiler communal or district heating systems should be designed to ensure that they meet the requirements of policy SI1 (a).
3) Where a heat network is planned but not yet in existence the development should be designed for connection at a later date.

10.27 Section 9.3.6 states:
"Low-emission CHP in this policy refers to those technologies which inherently emit very low levels of NO_x. It is not expected that gas engine CHP will fit this category with the technology that is currently available. Further details on circumstances in which it will be appropriate to use low-emission CHP and what additional emissions monitoring will be required will be provided in further guidance. This guidance will be regularly updated to ensure that it reflects changes in technology."

London Environmental Strategy

10.28 The London Environmental Strategy, published in May 2018, evaluates the current condition of London's environment at a city-wide level[viii]. This is the first strategy to bring together approaches to every aspect of London's environment, integrating the following areas:

- Air quality;
- Green infrastructure;
- Climate change mitigation and energy;
- Waste;
- Adapting to climate change;
- Ambient noise; and
- Low carbon circular economy.

10.29 The Strategy aims, among other objectives:
"for London to have the best air quality of any major world city by 2050, going beyond the legal requirements to protect human health and minimise inequalities".

10.30 Chapter 4 on Air Quality includes a series of objectives, policies and proposals to improve air quality. Several key issues have been highlighted to be addressed in the strategy:

- Achieving legal compliance as quickly as possible;
- Diesel vehicles, especially cars and vans;
- Tackling all sources of pollution;
- Government action;
- Maximising co-benefits between air quality and climate change policies; and

- Further reductions are needed in PM_{10} and $PM_{2.5}$, particularly from transboundary pollution, tyre and brake wear, and wood burning.

Local Planning Policy

London Borough of Wandsworth Local Plan

10.31 The London Borough of Wandsworth Local Plan – Core Strategy[ix] was adopted in March 2016. The Local Plan contains policy IS4 on 'protecting and enhancing environmental quality' which includes the following statement about air quality:

"The Council will support measures to protect and enhance the environmental quality of the borough and work with partner agencies to help deliver this. In particular measures will be taken to…Improve air quality in line with the Council's Air Quality Action Plan and minimise the emissions of air pollution from development, in line with the approach set out in the Mayor of London's Sustainable Design & Construction Supplementary Planning Guidance, ensuring that new major developments are air quality neutral in line with the London Plan".

London Borough of Wandsworth Air Quality Action Plan

10.32 The London Borough of Wandsworth declared a borough-wide AQMA on 2nd January 2001 due to the exceedance of the annual mean NO_2 and 24-hour mean PM_{10} objectives. As a result, the Council has a responsibility to produce an Air Quality Action Plan (AQAP). The London Borough of Wandsworth Air Quality Action Plan for 2016-2021[x] details the revised measures from the London Borough of Wandsworth Air Quality Action Plan (2004)[xi] that aim to improve air quality in the borough. The policies and proposals within the 2016-2021 Action Plan are centred around the following themes:

- Demonstrating the Council's commitment to improving air quality;
- Communicating about air quality;
- Reducing emissions and exposure;
- Development and buildings; and
- Regulation and monitoring.

Legislative Context

European legislation

10.33 The European Union directive on ambient air quality and cleaner air for Europe (2008/50/EC)[xii] sets legally binding limits for pollutant concentrations. This directive was made law in England through the Air Quality Standards Regulations 2010.

National Legislation

10.34 Part IV of the Environment Act 1995[xiii] places a duty on the Secretary of State for the Environment to develop, implement and maintain an Air Quality Strategy with the aim of reducing atmospheric emissions and improving air quality. The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in 2007[xiv], and provides the framework for ensuring the air quality limit values are complied with based on a combination of international, national and local measures to reduce emissions and improve air quality. The Air Quality Strategy includes a statutory duty, also under Part IV of the Environment Act 1995, for local authorities to undergo a process of Local Air Quality Management (LAQM). This requires local authorities to regularly and systematically review and assess air quality within their boundaries against a series of objectives, and appraise development and transport plans against these assessments.

10.35 The Air Quality Strategy sets out national air quality objectives in order to improve air quality in the UK. These air quality objectives have been used for comparison in this assessment, and are detailed in Table 10.1.

Table 10.1: Nitrogen Dioxide, PM_{10} and $PM_{2.5}$ Objectives

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
Particulate Matter (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

10.36 The objectives for NO_2 and PM_{10} were to have been achieved by 2005 and 2004, respectively, and continue to apply in all future years thereafter. Analysis of long-term monitoring data suggests that if the annual mean nitrogen dioxide concentration is less than 60µg/m^3 then the one-hour mean nitrogen dioxide objective is unlikely to be exceeded where road transport is the main source of pollution. This concentration is used to screen whether the one-hour mean

objective is likely to be achieved.

10.37 The Air Quality Strategy (2007) includes an exposure reduction target for smaller particles known as $PM_{2.5}$ (DETR, 2007). These are an annual mean target of 25 µg/m^3 by 2020 and an average urban background exposure reduction target of 15% between 2010 and 2020.

10.38 The air quality directive (2008/50/EC)[xii] includes a national exposure reduction target, a target value and a limit value for $PM_{2.5}$, shown in Table 10.2. The UK Government transposed this new directive into national legislation in June 2010.

Table 10.2: $PM_{2.5}$ Objectives

	Time Period	Objective / Obligation	To be Achieved By
UK Objectives	Annual mean	25µg/m^3	2020
	3 year running annual mean	15% reduction in concentrations measured at urban background sites	Between 2010 and 2020
European Obligations	Annual Mean	Target value of 25µg/m^3	2010
	Annual Mean	Limit value of 25µg/m^3	2015
	3 Year Average Exposure Indicator (AEI) (a)	Stage 2 indicative Limit value of 20µg/m^3	2020
	3 year Average Exposure Indicator (AEI)	Exposure reduction target relative to the AEI depending on the 2010 value of the 3 year AEI (ranging from a 0% to a 20% reduction)	2015

(a) The 3-year annual mean or AEI is calculated from the $PM_{2.5}$ concentration averaged across all urban background monitoring locations in the UK e.g. the AEI for 2010 is the mean concentration measured over 2008, 2009 and 2010.

Ecological Habitats

10.39 Objectives for the protection of vegetation and ecosystems have been set by the UK Government and were to have been achieved by 2000. They are summarised in Table 10.3 and are the same as the EU limit values. The objectives only strictly apply a) more than 20km from an agglomeration (about 250,000 people), and b) more than 5km from Part A industrial sources, motorways and built up areas of more than 5,000 people. However, Natural England (NE) has adopted a more precautionary approach and applies the objective to all internationally designated conservation sites and Sites of Special Scientific Interest (SSSIs). For the assessment of road schemes, Highways England (HE) follows this approach and requires an assessment of the impacts of roads traffic emissions on conservation sites (Designated Sites) within 200m of a road[xvii]. When pollutant concentrations exceed a critical level it is considered that there is a risk of harmful effects.

Table 10.3: Vegetation and Ecosystem Objectives (Critical Levels)

Pollutant	Time Period	Objective
Nitrogen Oxides (expressed as NO_2)	Annual Mean	30µg/m^3

10.40 Critical loads for nitrogen deposition onto sensitive ecosystems have been specified by United Nations Economic Commission for Europe (UNECE). They are defined as the amount of pollutant deposited to a given area over a year, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge. Exceedance of a critical load is used as an indication of the potential for harmful effects to occur.

Assessment Methodology

Study Area

10.41 For the construction phase assessment, the study area is defined as up to 350 m from the Site boundary in accordance with the IAQM guidance on the assessment of construction dust effects [iv].

10.42 The operational study area for human health impacts extends to where there is a predicted increase in road traffic resulting from the Development above the criteria defined in the IAQM/Environmental Protection UK (EPUK) guidance [xix] as follows:

- A change of Light Duty Vehicles (LDVs) flows of more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA or more than 500 AADT elsewhere;
- A change of Heavy Duty Vehicles (HDVs) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.

10.43 For impacts on ecological sites, the Highways Agency requires an assessment where a designated ecological site is within 200 m of a road with an increase in traffic of more than 1000 AADT for total traffic, or 200 AADT for HDVs as a result of the Development [xvii].

Existing Conditions

10.44 Information on existing air quality has been obtained by collating the results of monitoring carried out by the London Borough of Wandsworth (LBW) and the London Borough of Richmond upon Thames (LBRT). Background concentrations for the Site have been defined using the national pollution maps published by the Department of the Environment, Food and Rural Affairs (Defra). These cover the whole country on a 1x1 km grid[xv].

Construction Impacts

10.45 During pre-construction demolition and construction of the Development itself, the main potential effects are dust annoyance and locally elevated concentrations of PM_{10}. The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-site activities. Impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source.

10.46 Separation distance is also an important factor. Large dust particles (greater than 30µm), responsible for most dust annoyance, will largely deposit within 100m of sources. Intermediate particles (10-30µm) can travel 200 – 500 m. Consequently, significant dust annoyance is usually limited to within a few hundred metres of its source. Smaller particles (less than 10µm) are deposited slowly and may travel up to 1km; however, the impact on the short-term concentrations of PM_{10} occurs over a shorter distance. This is due to the rapid decrease in concentrations with distance from the source due to dispersion.

10.47 The SPG on 'The control of dust and emissions during construction and demolition'[v] outlines the risk evaluation to consider based on the Site evaluation process set out in the Institute of Air Quality Management (IAQM) 2014 guidance on the assessment of dust from demolition and construction[xvi].

10.48 In accordance with this SPG, the dust emission magnitude is defined as either large, medium or small (Table 10.4) taking into account the general activity descriptors on site and professional judgement.

10.49 The sensitivity of the study area to construction dust impacts is defined as high, medium and low (Table 10.5), taking into account professional judgement.

Table 10.4: Criteria for Dust Emission Magnitude

Dust Emission Magnitude	Activity
Large	**Demolition** >50,000m^3 building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >20m above ground level.
	Earthworks >10,000m2 site area, dusty soil type (e.g. clay), >10 earth moving vehicles active simultaneously, >8m high bunds formed, >100,000 tonnes material moved.
	Construction >100,000m^3 building volume, on site concrete batching, sandblasting.
	Trackout >50 HDVs out / day, dusty soil type (e.g. clay), >100m unpaved roads.
Medium	**Demolition** 20,000 - 50,000m^3 building demolished, dusty material (e.g. concrete) 10-20m above ground level
	Earthworks 2,500 - 10,000m^2 site area, moderately dusty soil (e.g. silt), 5-10 earth moving vehicles active simultaneously, 4m - 8m high bunds, 20,000 -100,000 tonnes material moved.
	Construction 25,000 - 100,000m^3 building volume, on site concrete batching.
	Trackout 10 - 50 HDVs out / day, moderately dusty surface material, 50 -100m unpaved roads.
Small	**Demolition** <20,000m^3 building demolished, non-dusty material, <10m above ground level, work in winter.
	Earthworks <2,500m^2 site area, non-dusty soil, <5 earth moving vehicles active simultaneously, <4m high bunds, <20,000 tonnes material moved.
	Construction <25,000m^3, non-dusty material.
	Trackout <10 HDVs out / day, non-dusty soil, < 50m unpaved roads.

Table 10.5: Area Sensitivity Definitions

Area Sensitivity	People and Property Receptors	Ecological Receptors
High	>100 dwellings, hospitals, schools, care homes within 50m. 10 – 100 dwellings within 20m. Museums, car parks, car showrooms within 50m. PM_{10} concentrations approach or are above the daily mean objective.	National or Internationally designated site within 20m with dust sensitive features / species present.
Medium	>100 dwellings, hospitals, schools, care homes within 100m. 10 – 100 dwellings within 50m. Less than 10 dwellings within 20m. Offices/shops/parks within 20m. PM_{10} concentrations below the daily mean objective.	National or Internationally designated site within 50m with dust sensitive features / species present.
Low	>100 dwellings, hospitals, schools, care homes 100 - 350m away. 10 – 100 dwellings within 50 – 350m. Less than 10 dwellings within 20 - 350m. Playing fields, parks, farmland, footpaths, short term car parks, roads, shopping streets. PM_{10} concentrations well below the daily mean objective.	Nationally designated site or particularly important plant species 20 - 50m. Locally designated site with dust sensitive features within 50m.

10.50 Based on the dust emission magnitude and the area sensitivity, the risk of dust impacts is then determined (Table 10.6), taking into account professional judgement.

Table 10.6: Risk of Dust Impacts

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

10.51 Based on the risk of dust impacts, appropriate mitigation is selected using professional judgement.

Significance Criteria

10.52 The construction impact significance criteria are based on the London Supplementary Planning Guidance on the Control of Emissions during Demolition and Construction[v]. The guidance recommends that no assessment of the significance of effects is made without mitigation in place, as mitigation is assumed to be secured by planning conditions, legal requirements or

required by regulations.

Construction and Operational Road Traffic Impacts

Human Health Receptors

10.53 Relevant sensitive locations are places where members of the public might be expected to be regularly present over the averaging period of the objectives. For the annual mean and daily mean objectives, sensitive receptors will generally be residential properties, schools, nursing homes, etc. When identifying these receptors, particular attention has been paid to assessing impacts close to junctions, where traffic may become congested, and where there is a combined effect of several road links.

10.54 The area assessed also takes into account guidance developed by EPUK and the IAQM[xix]. The guidance provides indicative criteria for when an air quality assessment is required. Existing receptors have been included in the assessment where they are adjacent to roads with an increase in traffic above the IAQM/EPUK guidance criteria below:

- A change of Light Duty Vehicles (LDVs) flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere; and
- A change of Heavy Duty Vehicles (HDVs) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere (Moorcroft and Barrowcliffe et al, 2017).

10.55 Based on the above criteria, two schools and twenty-five existing residential locations have been identified as sensitive receptors for the assessment. The locations of existing receptors were chosen to represent those where impacts from road traffic related to the Development are likely to be the greatest, i.e. as a result of development traffic at junctions. In addition, receptor locations R23 – R27 have been included in the assessment in order to assess the impacts of the relocation of the bus turnaround on Danebury Avenue. These locations are described in Table 10.7 and shown in Figure 10.1. Receptors have been modelled at a height of 1.5 m or 4.5 m, representing ground floor or first floor exposure, depending upon the first level of the building within which sensitive receptors have been identified.

10.56 In addition, ten locations within the Site have been chosen to assess the suitability of the Site for future occupants, the proposed Eastwood Nursery and Eastwood Children's Centre. Receptor locations were modelled at a height of 1.5 m or 4.5 m depending upon the first level of relevant exposure within the building. Proposed receptor locations are described in Table 10.8 below and shown in Figures 10.2 and 10.3.

10.57 Concentrations have also been predicted at three diffusion tube monitoring locations: Sites 36 and 25, Upper Richmond Road, and Site W25, Roehampton Church School. These monitoring locations are shown in Figure 10.4. Concentrations have been predicted at these locations in order to verify modelled results. Appendix 10.3 provides further details on the verification method.

Table 10.7: Description of Existing Receptor Locations

Receptor	Location	Grid Reference (x, y)	Modelled Height (m)
R1	Finchdean House	521874.0, 173955.7	4.5
R2	263, Danebury Avenue	521931.1, 173878.4	1.5
R3	Wheatley House	521990.5, 173890.4	4.5
R4	Woodcott House	522069.9, 173956.8	1.5
R5	215 (upstairs flat), Roehampton Lane	522364.7, 173786.0	4.5
R6	Flats above Majestic Wine, Roehampton Lane	522433.6, 173756.2	4.5
R7	1 - 31 Egelton House, Roehampton Lane	522445.5, 173723.4	1.5
R8	227, Roehampton Lane	522463.8, 173743.0	1.5
R9	3, Alton Road	522536.6, 173663.3	1.5
R10	Roehampton C of E Primary School	522552.5, 173689.6	1.5
R11	136 Roehampton Vale	521500.8, 172378.2	1.5
R12	1-18 Cedars Court, Clarence Lane	522115.2, 174244.7	1.5
R13	Vitali Close	522144.6, 174244.3	1.5
R14	44-62 Roebuck House	522183.0, 174710.1	1.5
R15	437 Upper Richmond Road	522092.8, 175471.0	1.5
R15	Thatched Cottage, Roehampton Lane	522070.9, 175475.5	1.5
R17	470 Upper Richmond Road	522079.0, 175504.8	1.5
R18	Hampton Row	521793.0, 175453.9	1.5
R19	East Sheen Primary School Playground	521298.8, 175460.3	1.5
R20	2 Shottfield Avenue	521108.3, 175445.3	1.5
R21	361, Upper Richmond Road	520532.9, 175397.3	4.5
R22	1, Florence Terrace	521457.3, 172347.8	1.5
R23	104 Sherfield Gardens	521675.1, 174160.1	1.5
R24	Shalden House First Floor	521650, 174098.9	4.5
R25	Shalden House First Floor	521629.1, 174103.5	4.5

Receptor	Location	Grid Reference (x, y)	Modelled Height (m)
R26	64 Sherfield Gardens	521610.5, 174165.6	1.5
R27	Bramley House First Floor	521594.8, 174125.5	4.5

Table 10.8: Description of Proposed Receptor Locations

Receptor	Location	Grid Reference (x, y)	Modelled Height (m)
PR1	Eastwood Nursery	521773.9, 174066.6	1.5
PR2	Eastwood Nursery	521809.8, 174034.3	1.5
PR3	Block N level 02 – adjacent to carpark vent	522273.0, 173813.7	4.5
PR4	Block K level 01	522207.0, 173855.2	1.5
PR	Block K level 02	522211.5, 173871.6	4.5
PR6	Block M level 03	522148.4, 173933.2	1.5
PR7	Block Q level 01	522089.1, 174073.7	1.5
PR8	Block K - adjacent to carpark vent	522127.6, 173844.8	4.5
PR9	Block Q - adjacent to carpark west vent	522013.4, 174067.7	1.5
PR10	Block Q carpark - adjacent to east vent	522072.5, 174073.4	1.5

Ecological Receptors

10.58 The Richmond Park SSSI has been identified within the study area as being potentially sensitive to air quality impacts. The SSSI is located approximately 78m south-west of the Site, and approximately 83m from Danebury Avenue.

10.59 In accordance with criteria contained within the Highways Agency's Design Manual for Roads and Bridges (the DMRB)[xvii], a detailed assessment of the operational road traffic impacts on an ecological site should be undertaken when a designated site is within 200m of a road with an increase in total road traffic of more than 1,000 AADT, or an increase in HDV traffic of more than 200 AADT, as a result of a development. These criteria have been used to assess whether the road traffic impacts of the Development on the Richmond Park SSSI are likely to be significant or not and therefore whether modelling of road traffic impacts is required.

Impact Predictions

10.60 Predictions have been carried out using the ADMS-Roads dispersion model (v4.1.1). The model requires the user to provide various input data, including the Annual Average Daily Traffic (AADT) flow, the proportion of HDVs, road characteristics (including road width and street canyon height, where applicable), and the vehicle speed. It also requires meteorological data. The model has been run using 2017 meteorological data from the London Heathrow Airport station, which is considered suitable for this area. Further details of model inputs and results processing tools are provided in Appendix 10.4.

10.61 AADT flows and the proportions of HDVs, for local network roads within 250m of the Development and monitoring sites have been provided by the Project's transport consultants, WSP, as have traffic flows generated by the Development. Traffic speeds have been estimated from local speed restrictions and take account of the proximity to a junction and congestion in the area. Traffic data used in this assessment are summarised in Appendix 10.5.

10.62 Traffic emissions were calculated using the Emission Factor Toolkit (EFT) v8.0, which utilises NO_x emission factors taken from the European Environment Agency COPERT 5 emission tool. The traffic data were entered into the EFT, along with speed data to provide combined emission rates for each of the road links entered into the model.

10.63 The Development carparks have been considered within the air quality assessment where they have more than 100 vehicle movements per day (in/out), in accordance with IAQM guidance[xix]. The carparks for the following blocks within the Development are expected to generate more

than 100 vehicle movements per day: Blocks Q, N/O, M, H/I/J, D/E/F/G, B/C and K.

10.64 For carparks with more than 100 vehicle movements per day, the guidance states that a detailed assessment of the carparks is required when the ventilation extract is located within 20m of a relevant receptor. As emissions from the Block M carpark are expected to be discharged at roof level, no further assessment of this carpark has been carried out. In addition, ventilation details for the outline elements of the Development (Blocks H, I, J, D, E, F, G, B and C) are unknown and will need to be considered at the detailed planning stage. A detailed assessment of carpark emissions has therefore been undertaken for the carparks within Blocks Q, N/O and K. A worst-case scenario has been assessed which assumes each of the carparks emissions are discharged via a singular ventilation extract, located adjacent to a relevant receptor location. The carpark ventilation extracts have been modelled as volume sources, and cold start emissions have been calculated for each of the carparks assessed.

10.65 The impacts of the relocation of the bus turnaround on Danebury Avenue have also been assessed. The number of buses expected to be using the bus turnaround has been provided by Project's transport consultants, Arup, and is assumed to be an average of 210 buses per day, based upon the bus timetable. Buses will be required to turn their engines off when parked in the bus turnaround. Therefore, cold start emissions have also been calculated for the bus turnaround, based upon an average bus waiting time of 10 minutes.

10.66 In order to take account of uncertainties in future year vehicle emission factors, the assessment has been carried out for 2021 as this is the earliest year block O (the first block to be completed within the Site) is expected to be occupied. In accordance with Appendix 10.6, emissions and backgrounds for 2021 have been used in the future year assessment, combined with completed development traffic for 2021. This is considered to provide a conservative and robust assessment of the impacts of the Development (see Appendix 10.6 for more details).

Air Quality Neutral Calculations

10.67 The Air Quality Neutral calculation has been undertaken for transport emissions following the methodology described on the 'Air Quality Neutral Planning Support Update: GLA80391' guidance[xviii].

10.68 The emission benchmarks used in the assessment are summarised in Appendix 10.1.

Significance Criteria

10.69 There is no official guidance in the UK on how to assess the significance of air quality impacts of a new development. The approach developed by the IAQM and EPUK has therefore been used[xix].

10.70 The guidance sets out three stages: determining the magnitude of change at each receptor, describing the impact, and assessing the overall significance. Impact magnitude relates to the change in pollutant concentration; the impact description relates this change to the air quality objective.

10.71 Table 10.9 sets out the impact magnitude descriptors, whilst Table 10.10 sets out the impact descriptors.

Table 10.9: Impact Magnitude for Changes in Air Pollutant Concentrations

Magnitude (% Change in Concentration)	Annual Mean NO_2 and PM_{10} (40 µg/m³)	Annual Mean $PM_{2.5}$ (25 µg/m³)	Annual Mean of 32 µg/m³ equating to 35 days above 50 µg/m³ for PM_{10}
Very Large (≥9.5%)	≥3.8 µg/m³	≥2.375 µg/m³	≥3.04 µg/m³
Large (>5.5% - ≤9.5%)	>2.2 – ≤3.8 µg/m³	>1.375 – ≤2.375 µg/m³	>1.76 - ≤3.04 µg/m³
Medium (>1.5% - ≤5.5%)	>0.6 – ≤2.2 µg/m³	>0.375 – ≤1.375 µg/m³	>0.48 - ≤1.76 µg/m³
Small (>0.5% - ≤1.5%)	>0.2 – ≤0.6 µg/m³	>0.125 – ≤0.375 µg/m³	>0.16 - ≤0.48 µg/m³
Imperceptible (≤0.5%)	≤0.2 µg/m³	≤0.125 µg/m³	≤0.16 µg/m³

Table 10.10: Impact Descriptor for Changes in Concentration at a Receptor

Concentration with development in relation to Objective / Limit Value	Emission Magnitude				
	Imperceptible	Small	Medium	Large	Very Large
> 109.5 % (a)	Negligible	Moderate	Major	Major	Major
>102.5% - ≤109.5% (b)	Negligible	Moderate	Moderate	Major	Major
>94.5% - ≤102.5% (c)	Negligible	Minor	Moderate	Moderate	Major
>75.5% - ≤94.5% (d)	Negligible	Negligible	Minor	Moderate	Moderate
≤75.5% (e)	Negligible	Negligible	Negligible	Minor	Moderate

Where concentrations increase the impact is described as adverse, and where it decreases as beneficial.
(a) NO_2 or PM_{10}: > 43.8µg/m^3 annual mean; $PM_{2.5}$ >27.4µg/m^3 annual mean; PM10 >35.0µg/m^3 annual mean (days).
(b) NO_2 or PM_{10}: > 41.0 – ≤ 44µg/m^3 annual mean; $PM_{2.5}$ > 25.6 – ≤27.4µg/m^3 annual mean; PM_{10} >32.8 – ≤35.0 µg/m^3 annual mean (days).
(c) NO_2 or PM_{10}: > 37.8 – ≤41.0µg/m^3 annual mean; $PM_{2.5}$ >23.6 – ≤25.5µg/m^3 of annual mean; PM_{10} >30.2 – ≤32.8µg/m^3 annual mean (days).
(d) NO_2 or PM_{10}: >30.2 - ≤37.8µg/m^3 annual mean; $PM_{2.5}$ >18.9 - ≤23.75µg/m^3 annual mean; or <24 - ≤ 30.4µg/m^3 annual mean (days).
(e) NO_2 or PM_{10}: ≤30 µg/m^3 annual mean; $PM_{2.5}$ ≤18.75 µg/m^3 annual mean; PM_{10} ≤24.2µg/m^3 annual mean (days).

10.72 The guidance states that the assessment of significance should be based on professional judgement, taking into account factors including:

- The number of properties affected by minor, moderate or major air quality impacts and a judgement on the overall balance;
- The magnitude of the changes and the descriptions of the impacts at the receptors i.e. Tables 10.9 and 10.10 findings;
- Whether or not an exceedance of an objective or limit value is predicted to arise in the operational study area (where there are significant changes in traffic) where none existed before or an exceedance area is substantially increased;
- The uncertainty, comprising the extent to which worst-case assumptions have been made; and
- The extent to which an objective or limit value is exceeded.

10.73 Impacts are deemed to be either adverse or beneficial. Where impacts can be considered in isolation at an individual receptor, moderate or major impacts (i.e. per Table 10.10) may be considered to be a significant environmental effect, whereas negligible or minor adverse impacts would not be considered significant. The overall effect however, needs to be considered in the round taking into account the changes at all of the modelled receptor locations, with a judgement made as to whether the overall air quality effect of the Development is significant or not.

10.74 There is no official guidance in the UK on how to assess the significance of air quality impacts of existing sources on a new development. The assessment of proposed receptors has therefore been limited to predicting air quality at the site and the significance of this is based on whether the National Air Quality Strategy Objectives (NAQOs), outlined in Table 10.1, for each pollutant are exceeded or not.

Limitations and Assumptions

10.75 There are many components that contribute to the uncertainty in predicted concentrations. The model used in this assessment is dependent upon the traffic data that have been input

which will have inherent uncertainties associated with them. There is then additional uncertainty as the model is required to simplify real-world conditions into a series of algorithms.

10.76 A disparity between national road transport emissions projections and measured annual mean concentrations of NO_x and NO_2 has been identified in recent years. Whilst projections suggest that both annual mean nitrogen oxides and NO_2 concentrations from road traffic emissions should have fallen significantly over the past 6 – 8 years, at many monitoring sites levels have remained relatively stable, or have shown a slight increase[xx].

10.77 The Development modelling has been based on 2021 emission factors and background concentrations, whilst utilising Development traffic flows for 2021 but assuming that the Development is fully built out. The model has been verified against 2017 monitoring data. This is considered to provide a robust assessment, taking into account the uncertainties regarding future vehicle emission factors.

10.78 Site-specific monitoring has been requested by LBW. This monitoring will take place between April-October 2019 and the results are expected to be published in a report submitted to LBW in November 2019.

Baseline Conditions

LAQM

10.79 The LBW has declared an AQMA across the entire borough due to the exceedances of the annual mean NO_2 and 24-hour mean PM_{10} objective. In addition, the neighbouring local authority, the LBRT, has also declared a borough-wide AQMA for the exceedances of the annual mean NO_2 and PM_{10} objectives, as well as the 24-hour mean PM_{10} objective.

Local Authority Monitoring

Nitrogen Dioxide (NO_2)

10.80 LBW carries out automatic monitoring at six sites in the borough, however both stations are located more than 2km from the Site and are therefore not considered representative. In addition, the LBW currently has a network of diffusion tubes to monitor NO_2 concentrations. The closest monitoring location is W25 on Roehampton Lane, located approximately 160m from the Site. Monitoring at W25 began in January 2017. In addition, LBRT also carries out diffusion

tube monitoring in close proximity to the Site. The closest and most representative LBW and LBRT monitoring locations are described Table 10.11 and are shown in Figure 10.4.

Table 10.11: Measured NO_2 Concentrations, 2013-2017

Site ID	Site Type	Within AQMA	Annual Mean (µg/m³)				
			2013	2014	2015	2016	2017
London Borough of Wandsworth							
*W25 – Roehampton Church School, Roehampton Lane	R	Y	-	-	-	-	32
W6 – 21, Daylesford Avenue, Putney	UB	Y	26	26	24	28	23
London Borough of Richmond upon Thames							
*25 – Upper Richmond Road West (near Sheen School)	R	Y	**51**	**51**	**45**	**46**	38
*36 – Upper Richmond Road West (Sheen Lane)	K	Y	**56**	**56**	**49**	**50**	**60**
49 – Upper Richmond Road (War Memorial, Sheen Lane)	K	Y	**45**	**45**	39	**44**	31
51 – Sheen Lane, Sheen Railway Crossing	K	Y	34	34	28	32	35

Exceedances of the objective highlighted in bold; NO_2 annual means exceeding 60 µg/m³, indicating a potential exceedance of the NO_2 1-hour mean objective, are underlined;
R = Roadside; K = Kerbside; UB = Urban Background
2017 Wandsworth data obtained from the Wandsworth Borough Council Air Quality Annual Status Report (ASR) for 2017[xxi];
2013-2017 Richmond upon Thames data obtained from the Richmond upon Thames Air Quality ASR for 2017[xxii].
*Used for model verification.

10.81 Measured concentrations were below the annual mean NO_2 objective at the closest monitoring location to the Site, W25, in 2017. Measured concentrations have been above the annual mean objective between 2013 – 2017 at Site 36, 2013 – 2016 at Site 25, and 2013, 2014 and 2015 at Site 49. There is no clear trend across the monitoring data.

Site Specific Monitoring

10.82 NO_2 monitoring will be undertaken across the Site and along Roehampton Lane for a six-month period between April - October 2019. The monitoring locations have been agreed with LBW and are shown in Figure 10.5[xxiii]. The monitoring report presenting the results of Site specific monitoring is expected to be submitted to LBW in November 2019.

Backgrounds Concentrations

10.83 In addition to these measured concentrations, estimated background concentrations for the Site and surrounding area have been obtained from the national maps provided by Defra[xv] and are shown in Table 10.12. The background concentrations are below the relevant objectives. The mapped background PM_{10} and $PM_{2.5}$ concentrations were calibrated against background concentrations measured at the LBW urban background automatic monitoring site, WA9 (see Appendix 10.7 for more details).

Table 10.12: Estimated Annual Mean Background Concentrations

Year	Grid Reference	Annual Mean (µg/m³)			
		NO_X	NO_2	PM_{10}	$PM_{2.5}$
2017	520_175	36.2	24.1	16.5	10.6
	521_172	28.5	19.9	14.7	9.6
	521_173	25.4	17.9	14.1	9.3
	521_174	25.4	17.9	14.1	9.3
	522_173	31.7	21.8	15.6	10.0
	522_174	30.9	21.2	15.4	9.9
2021	520_175	29.1	20.1	16.0	10.1
	521_172	22.8	16.4	14.3	9.2
	521_173	20.6	14.9	13.7	8.9
	521_174	20.6	14.9	13.7	8.9
	522_173	24.8	17.6	15.1	9.6
	522_174	24.5	17.4	15.0	9.5

Future Baseline Concentrations

10.84 The ADMS-Roads model has been run to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations at each of the existing and proposed receptor locations identified in Table 10.7 for baseline years of 2017 and 2021. The results are presented in Table 10.13.

Table 10.13: Predicted Annual Mean Baseline Concentrations of NO_2, PM_{10} and $PM_{2.5}$ at Existing Receptor Locations in 2017 and 2021.

Receptor	Baseline 2017 [a]			Future Baseline 2021 [a]		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R1	19.7	14.4	9.4	15.9	14.0	9.0
R2	20.4	14.5	9.5	16.3	14.0	9.0
R3	19.6	14.4	9.4	15.8	13.9	9.0
R4	24.0	16.0	10.3	19.0	15.5	9.8
R5	31.8	17.0	10.9	24.0	16.4	10.3
R6	31.9	17.0	10.9	24.0	16.4	10.3
R7	35.0	17.5	11.2	26.0	16.8	10.5
R8	41.5	18.5	11.8	30.3	17.7	11.0
R9	33.3	17.2	11.0	24.9	16.6	10.4
R10	39.6	18.2	11.6	29.0	17.4	10.9
R11	40.6	18.4	11.8	30.6	17.5	11.0
R12	33.3	17.3	11.1	25.4	16.6	10.4
R13	45.1	19.3	12.3	33.6	18.4	11.4
R14	38.5	18.1	11.6	28.9	17.3	10.8
R15	47.4	20.1	12.8	35.2	19.2	11.9
R16	39.5	18.7	11.9	29.5	18.0	11.2
R17	39.5	18.6	11.9	29.3	17.9	11.1
R18	35.9	17.8	11.4	27.0	17.2	10.7
R19	39.2	18.6	11.9	29.3	17.9	11.1
R20	34.5	18.1	11.6	26.3	17.5	10.9
R21	50.2	20.6	13.1	37.0	19.6	12.1
R22	45.1	19.3	12.4	33.8	18.3	11.5
R23	19.6	14.4	9.4	15.9	14.0	9.0
R24	18.8	14.3	9.3	15.4	13.9	8.9
R25	18.8	14.3	9.3	15.4	13.9	8.9
R26	20.0	14.4	9.4	16.1	14.0	9.0
R27	19.1	14.3	9.4	15.5	13.9	9.0
Objective	**40**	**40**	**25**	**40**	**40**	**25**

[a] Annual mean and objective expressed in $\mu g/m^3$
Exceedances highlighted in bold.

10.85 The annual mean objective for NO_2 is predicted to be exceeded at receptor locations R8, R11,

R13, R15, R21 and R22 in 2017. There are no predicted exceedances of the annual mean NO_2 objective in 2021.

10.86 The data in Table 10.13 indicates an improving trend in air quality overtime due to predicted improvements in road traffic emissions with the introduction of Euro 6/VI vehicle emission standards.

Likely Significant Effects

Construction Phase

Construction Dust Impacts

10.87 The main likely significant effects during construction are dust deposition and elevated PM_{10} concentrations. The following construction activities have the potential to cause emissions of dust:

- Site preparation including delivery of construction material, erection of fences and barriers;
- Earthworks including digging foundations and landscaping;
- Materials handling such as storage of material in stockpiles and spillage;
- Construction and fabrication of units; and
- Disposal of waste materials off-site.

10.88 Typically, the main cause of unmitigated dust generation on construction sites is from demolition and vehicles using unpaved haul roads, and off site from the suspension of dust from mud deposited on local roads by construction traffic. The main determinants of unmitigated dust annoyance are the weather and the distance to the nearest receptor. In accordance with the SPG on 'The Control of Dust and Emissions during Construction and Demolition', an assessment of the likely construction dust effects is not made without mitigation in place. This assessment therefore determines the risk of dust impacts from the construction of the Development so that an appropriate level of mitigation can be identified. With appropriate mitigation in place, the residual effect of construction impacts on air quality is assessed as not significant.

10.89 A worst-case assessment of construction dust impacts has been carried out as it has been assumed that the whole Site is under construction at the same time. The phasing of the Development means in reality this will not be the case and the risk of dust impacts for each phase individually is likely to be less than for the Development as a whole.

10.90 Based on the SPG on 'The Control of Dust and Emissions during Construction and Demolition'[v] criteria, the dust emissions magnitude for demolition is considered to be large due to the extent of the demolition works. The dust emission magnitude for earthworks is considered to be large as the site area is more than 10,000 m^2 and the underlying soil type is clay-based. For construction, the dust emission magnitude is considered to be large due to the building volume to be constructed. For trackout, the dust emission magnitude is expected to be large as during peak construction, the number of HGV movements are expected to exceed 50 outward movements per day.

10.91 The study area is considered to be of high sensitivity, as there are more than 10 residential properties within 20m of the Development (Table 10.5). In addition, some of the blocks within the Development are expected to be completed earlier than others and as a result, proposed receptors will be present on the Site during Development construction. Appropriate mitigation from the SPG, corresponding to a high-risk site is therefore required during the construction phase (Table 10.6).

Construction Road Traffic Impacts

10.92 The construction of the Development is anticipated to commence in 2020, with 9 HDV and 16 LDV AADT movements predicted to be generated as a result of construction activities. The peak construction year is anticipated to be 2028, with 59 HDV and 149 LDV AADT movements predicted during this year. The construction traffic exceeds the IAQM/EPUK guidance thresholds (Paragraph 10.55) in the majority of years leading up to completion of the Development in 2030, with the exception of 2020 and 2026.

10.93 The operational road traffic data utilised in the 2021 assessment is greater than the construction traffic in the peak construction year and therefore the increase in HDV and LDV vehicles resulting from construction of the Development has been taken into account in the operational road traffic modelling. Therefore, the changes in NO_2, PM_{10} and $PM_{2.5}$ concentrations resulting from the construction traffic will be less than those predicted in the assessment of operational road traffic impacts below (see Paragraph 10.102).

Operational Phase

Existing Human Health Receptors

10.94 Predicted annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ at existing receptors in 2021

both with and without the Development in place are presented in Table 10.14.

Table 10.14: Predicted Annual Mean Concentrations of NO_2, PM_{10} and $PM_{2.5}$ at Existing Receptor Locations in 2021.

Receptor	2021 Without Development			2021 With Development		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
R1	15.9	14.0	9.0	16.1	14.0	9.0
R2	16.3	14.0	9.0	16.6	14.1	9.1
R3	15.8	13.9	9.0	16.0	14.0	9.0
R4	19.0	15.5	9.8	19.2	15.5	9.8
R5	24.0	16.4	10.3	24.2	16.5	10.3
R6	24.0	16.4	10.3	24.2	16.5	10.3
R7	26.0	16.8	10.5	26.2	16.9	10.6
R8	30.3	17.7	11.0	30.6	17.8	11.1
R9	24.9	16.6	10.4	25.1	16.6	10.4
R10	29.0	17.4	10.9	29.3	17.5	10.9
R11	30.6	17.5	11.0	30.6	17.5	11.0
R12	25.4	16.6	10.4	25.6	16.6	10.4
R13	33.6	18.4	11.4	33.8	18.4	11.4
R14	28.9	17.3	10.8	29.1	17.4	10.9
R15	35.2	19.2	11.9	35.4	19.2	11.9
R16	29.5	18.0	11.2	29.6	18.0	11.2
R17	29.3	17.9	11.1	29.4	17.9	11.2
R18	27.0	17.2	10.7	27.0	17.2	10.8
R19	29.3	17.9	11.1	29.4	17.9	11.2
R20	26.3	17.5	10.9	26.3	17.5	10.9
R21	37.0	19.6	12.1	37.1	19.6	12.2
R22	33.8	18.3	11.5	33.9	18.3	11.5
R23	15.9	14.0	9.0	17.0	14.0	9.0
R24	15.4	13.9	8.9	16.5	13.9	9.0
R25	15.4	13.9	8.9	16.5	13.9	8.9
R26	16.1	14.0	9.0	17.1	14.1	9.0
R27	15.5	13.9	9.0	16.2	13.9	9.0

Objective	**40**	**40**	**25**	**40**	**40**	**25**

Annual mean and objective expressed in $\mu g/m^3$

10.95 The predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations in 2017 without and with the Development in place are below the relevant objectives at all existing receptor locations.

10.96 None of the predicted annual mean NO_2 concentrations exceed 60 $\mu g/m^3$ and therefore exceedance of the 1-hour mean NO_2 objective is unlikely.

10.97 None of the predicted annual mean PM_{10} concentrations exceed 32 $\mu g/m^3$ and therefore the 24-hour mean PM_{10} objective is not predicted to be exceeded.

10.98 The changes in annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ are presented in Table 10.15 below.

Table 10.15: Change in Predicted Concentrations brought about by the Development

Receptor	NO_2	PM_{10}	$PM_{2.5}$
R1	0.26	0.05	0.03
R2	0.34	0.06	0.04
R3	0.20	0.04	0.02
R4	0.16	0.03	0.02
R5	0.22	0.04	0.02
R6	0.18	0.04	0.02
R7	0.22	0.05	0.03
R8	0.32	0.07	0.04
R9	0.20	0.04	0.02
R10	0.28	0.06	0.03
R11	0.06	0.01	0.01
R12	0.11	0.02	0.01
R13	0.26	0.06	0.03
R14	0.20	0.04	0.02
R15	0.21	0.05	0.03
R16	0.11	0.02	0.01
R17	0.09	0.02	0.01
R18	0.06	0.01	0.01
R19	0.08	0.02	0.01
R20	0.05	0.01	0.01
R21	0.11	0.02	0.01
R22	0.08	0.02	0.01
R23	1.11	0.05	0.03
R24	1.16	0.03	0.02
R25	1.10	0.03	0.02
R26	1.08	0.06	0.03
R27	0.70	0.03	0.02

10.99 Based on the impact magnitude descriptors in Table 10.9, the changes in annual mean NO_2 concentrations range from imperceptible to medium. The following receptors locations are predicted to have a medium change in NO_2 concentrations: R23, R24, R25, R26 and R27. Small changes in NO_2 concentrations are predicted to occur at the following receptor locations: R1,

R2, R5, R7, R8, R10, R13 and R15. The predicted change in NO_2 concentrations at the remaining receptor locations is considered imperceptible.

10.100 The changes in PM_{10} and $PM_{2.5}$ concentrations at all receptor locations is predicted to be imperceptible.

10.101 Using the criteria set out in Table 10.10, the impacts on NO_2, PM_{10} and $PM_{2.5}$ concentrations is described as negligible at all receptor locations.

Proposed Human Health Receptors

10.102 Concentrations at proposed receptor locations within the Development in 2021 are presented in Table 10.16.

Table 10.16: Predicted Concentrations of NO_2, PM_{10} and $PM_{2.5}$ at Proposed Receptors.

Receptor	With Development		
	NO_2	PM_{10}	$PM_{2.5}$
PR1	16.6	14.1	9.1
PR2	17.0	14.2	9.1
PR3	21.9	16.0	10.1
PR4	20.7	15.8	10.0
PR5	21.1	15.9	10.0
PR6	22.6	16.2	10.2
PR7	20.7	15.7	9.9
PR8	19.1	15.5	9.8
PR9	21.5	15.6	9.9
PR10	19.5	15.4	9.7
Objective	**40**	**40**	**25**

10.103 Predicted concentrations in 2021 at receptor locations within the Development are well below the relevant objectives. The Development is therefore considered suitable for the proposed mixed-use development.

Ecological Receptors

10.104 Development traffic travelling along the Danebury Avenue is predicted to generate an

additional 1097 AADT. However, it is considered that the majority of vehicles associated with the Development will travel east along Danebury Avenue and onto Roehampton Lane as vehicle access is restricted along Danebury Avenue to the west of Alton Primary School. Therefore, the Development traffic travelling west along Danebury Avenue within 200m of the Richmond Park SSSI will be below the 1000 AADT criteria for a detailed assessment to be considered necessary. In addition, the Richmond Park SSSI is located more than 80m from Danebury Avenue and at this distance, the effect of Development road traffic emissions on the SSSI will be minimal. The effect of road traffic on the Richmond Park SSSI is therefore considered to be not significant.

Air Quality Neutral Calculation – Building Emissions

10.105 As details of the energy centre are not currently available, the building emissions benchmark has not been calculated. However, the need to ensure that the Development is air quality neutral will be taken into account when specifying details of the energy centres.

Air Quality Neutral Calculation – Transport Emissions

10.106 The 'Air Quality Neutral' calculations for transport emissions for the Development are described in Table 10.17 and Table 10.18.

Table 10.17: Development Land Use and Trip Generation

Land Use	Number of Units	GIA (m^2)	Trips/Day	Trips/Annum
Flexible Commercial (Classes A1-A3, A5, B1 & D1)	-	3,402	120	43,800
Office (Class B1)	-	643	30	10,950
Residential (Class C3)	1,103	-	2,043	745,695

10.107 A comparison between the developments benchmarked and total emissions are shown in Table 10.18. The inner London transport emissions factors have been used, and the Development emissions have been compared against the inner London Transport Emission Benchmarks (TEBs).

Table 10.18: Development Transport Air Quality Neutral Benchmarks

Land Use	Benchmarked Emissions*		Development Emissions*		Comparison to Benchmarked Emissions*	
	NO_x	PM_{10}	NO_x	PM_{10}	NO_x	PM_{10}
Flexible Commercial (Classes A1-A3, A5, B1, D1)	745	133.7	95.6	17.2	-649.4	-116.5
Office (Class B1)	7.3	1.3	31.2	5.6	23.9	4.3
Residential (Class C3)	615.5	110.3	1,020.9	183.5	405.4	73.2
Total	**1,367.8**	**245.3**	**1,147.7**	**206.3**	**-220.2**	**-39.0**

*Units: kg/annum

10.108 The total transport NO_x and PM_{10} emissions from the class A1-A3, A5, B1 and C3 elements of the Development are approximately 16% below the benchmark requirements of the SPG.

10.109 As specific TEBs are not available for the land use category D1, an alternative approach is to compare traffic generation with the benchmark trip rate for this particular land use class. Table 10.19 provides the trip generation data for land-use class D1.

Table 10.19: Land Use Class and Trip Generation for Proposed Community Uses.

Land Use	GIA (m^2)	Trips/Day	Trips/Annum	Trips/m^2/Annum
Nursery, Library and Healthcare (Class D1)	5,527	180	65,700	11.9

10.110 The benchmarked trip generation rate for D1 developments (inner London) is provided in Table A1.1 of the Air Quality Neutral Planning Support Update: GLA8039121[xviii]. The total benchmark trip generation rate is 65.1 trips/m^2/annum for D1 developments. A comparison with the Development trip rate is provided in Table 10.20.

Table 10.20: Comparison to Benchmarks for Proposed D1 Land Uses

Land Use	Benchmarked Trips*	Development Trips*	Comparison to Benchmarked Emissions*
Nursery, Library and Healthcare (Class D1)	65.1	11.9	- 53.2

* trips/m2/annum

10.111 The number of predicted trips generated by the Development are approximately 82% below the benchmark requirements of the SPG.

10.112 As predicted vehicle trips and traffic emissions generated by the Development are below the

relevant benchmarks of the SPG, the Development will be compliant with the air quality neutral requirement of the SPG on 'Sustainable Design and Construction' with regards to transport.

Effect Significance

10.113 Overall, considering the conservative nature of the assessment, and the criteria set out in Paragraph 10.73, the air quality effect of road traffic generated by the Development is considered to be not significant as there are no predicted exceedances of the relevant air quality strategy objectives at any of the existing receptor locations in 2021.

10.114 Since the operational road traffic modelling was carried out, the traffic data for the Development has been updated. However, the changes to the traffic are very minor, with the greatest change being nine additional vehicles on Roehampton Lane (north of Wanborough Drive). These changes are not considered to be significant and will not alter the conclusions of the assessment presented here.

Mitigation Measures

Construction Phase

10.115 The following standard high-risk mitigation measures from the SPG on 'The control of dust and emissions during construction and demolition'[v] are recommended. An Air Quality and Dust Management Plan (AQDMP) should be submitted to the LBW prior to works commencing on the Site.

Site Management

- Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site;
- Develop a Dust Management Plan;
- Display the name and contact details of persons accountable on the Site boundary;
- Display the head or regional office information on the Site boundary;
- Record and respond to all dust and air quality pollutant emissions complaints;
- Make a complaint log available to LBW when asked;
- Carry out regular Site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to LBW when asked;
- Increase Site inspection frequency during prolonged dry or windy conditions and when

activities with high dust potential are being undertaken;
- Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the Site, and the action taken to resolve the situation is recorded in the log book; and,
- Hold regular liaison meetings with other high-risk construction sites within 500m of the Site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised.

Preparing and Maintaining the Site

- Plan Site layout so that machinery and dust causing activities are located away from receptors, as far as possible;
- Erect solid screens or barriers around dusty activities on the Site boundary at least as high as any stockpile on site;
- Fully enclose the Site or specific operations where there is a high potential for dust production and the Site is active for an extensive period;
- Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution;
- Avoid Site run off of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove potentially dusty materials from the Site as soon as possible;
- Cover, seed or fence stockpiles to prevent wind whipping;
- Carry out regular dust soiling checks of buildings within 100m of the Site boundary and cleaning to be provided if necessary;
- Provide showers and ensure change of shoes and clothes are required before going off-site to reduce transport of dust;
- Agree monitoring locations with LBW;
- Where possible, commence baseline monitoring at least three months before the construction phase begins; and,
- Put in place real-time dust and air quality pollutants monitors across the Site and ensure they are checked regularly.

Operating Vehicle/Machinery

- Ensure all on road vehicles comply with the London Low Emission Zone;
- Ensure all non-road mobile machinery (NRMM) comply with the standards; where applicable;
- Ensure all vehicles switch off engines when stationary;

- Avoid the use of diesel or petrol powered generators where possible;
- Impose and signpost a maximum speed limit of 10mph on surface haul and work areas;
- Produce a Construction Logistics Plan (CLP) to manage the sustainable delivery of goods and materials; and,
- Implement a Travel Plan that supports and encourages sustainable travel (public transports, cycling, walking, and car-sharing).

Operations

- Only use cutting, grinding and sawing equipment with dust suppression equipment;
- Ensure an adequate supply of water on-site for dust suppressant;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use water sprays on such equipment where appropriate; and
- Ensure equipment is readily available on-site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Reuse and recycle waste to reduce dust from waste materials;
- Avoid bonfires and burning of waste materials on-site.

Demolition

- Use of soft strip inside buildings before demolition;
- Ensure effective water suppression is used during demolition operations;
- Avoid explosive blasting; and
- Bag and remove any biological debris or damp down such material before demolition.

Earthworks

- Re-vegetate earthworks and exposed areas/ soil stockpiles to stabilise surfaces;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil; and,
- Only remove secure covers in small areas during work and not all at once;

Construction

- Avoid scabbling (roughening of concrete surfaces) if possible;
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out;
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emissions control systems to prevent escape of material and overfilling during delivery; and,
- For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.

Trackout

- Regularly use a water-assisted dust sweeper on the access and local roads, as necessary to remove any material track on the Site;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transportation;
- Record all inspections of haul routes and any subsequent action in a Site log book;
- Install hard surfaced haul routes which are regularly damped down with fixed or mobile sprinklers systems and regularly cleaned;
- Inspect haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Implement a wheel washing system;
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever Site size and layout permits;
- Access gate to be located at least 10m from receptors where possible; and,
- Apply dust suppressants to locations where a large volume of vehicles enter and exit the construction site.

Operational Phase

10.116 The effects of Development traffic on local air quality are judged to be not significant. No additional traffic mitigation is therefore required to reduce the direct effects of the Development on local air quality.

10.117 Furthermore, air quality within the Site is considered to be acceptable for future residents. Nonetheless, the Village Square, adjacent to Block A can be considered as 'designed-in' mitigation as it increases the distance between residential receptors within Block A and road traffic emission sources on Roehampton Lane.

Residual Effects

Construction Phase

10.118 With appropriate mitigation in place, the residual effect of construction is assessed to be not significant on existing and proposed human health receptor locations and the Richmond Park SSSI.

Operational Phase

10.119 The operational residual air quality effects of the Development are judged to be not significant on existing and proposed human health receptor locations and the Richmond Park SSSI.

Cumulative Effects

Construction Phase

10.120 The Digby Stuart and Southlands Colleges scheme is the only cumulative scheme in the area surrounding the Site which is either expected to be under construction or fully constructed before the completion of the Development. Although construction of more than one development in close proximity to one another does increase the risk of construction dust impacts to sensitive receptors, effective mitigation is expected to reduce the impact such that the impact from the Development should not be significant regardless of cumulative construction projects. The Digby Stuart and Southlands Colleges scheme is also expected to employ similar dust mitigation measures, secured by planning condition and included in the AQDMP.

10.121 In addition, the separation distance between the Digby Stuart and Southlands Colleges Scheme and the Site (approximately 370m) is such that significant adverse dust effects are unlikely to occur. This is due to decreasing dust deposition within a few hundred metres of the source; in the case of larger dust particles which are most likely to cause dust nuisance, most deposition occurs within 100 m of the source.

Operational Phase

10.122 The future year baseline and with development traffic data utilised within the assessment includes committed developments in the area (see Chapter 9 – Transport and Access for more detailed information). In the specific case of Richmond Park SSSI, there are no cumulative flows on Danebury Avenue and therefore no change to the assessment of the impact of development traffic alone.

10.123 Therefore, the assessment documented in this chapter has considered relevant cumulative developments and the conclusions provided above account for potential cumulative impacts.

Summary

10.124 The air quality effects associated with the construction and operation of the Development have been assessed.

Baseline Conditions

10.125 The LBW has declared a borough-wide AQMA due to the exceedance of the annual mean NO_2 and 24-hour PM_{10} objectives.

Assessment Methodology

10.126 During construction the main potential effects are dust annoyance and locally elevated concentrations of fine particulate matter (PM_{10}). The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-site activities. Impacts have the potential to occur when construction activities coincide with dry, windy conditions, and where people are located downwind and close to the activity being undertaken.

10.127 The assessment has considered the construction activities that will be undertaken and the risk that these pose to identify the mitigation measures that will need to be put in place.

10.128 The main operational effects of the Development will arise from road traffic emissions. Pollutant concentrations have been modelled at locations adjacent to the road network where the effects are likely to be greatest.

Likely Significant Effects

10.129 With construction dust mitigation measures in place, construction dust effects are not significant.

10.130 The air quality effects of road traffic generated by the Development, taking into account the committed developments, are considered to be not significant, as there are no predicted exceedances of the Air Quality Strategy Objectives for NO_2, PM_{10} and $PM_{2.5}$ with or without the Development in place in 2021.

10.131 Vehicle trips and road traffic emissions generated by the Development are below the relevant benchmarks of the SPG. The Development will therefore be compliant with the air quality neutral requirement of the SPG on 'Sustainable Design and Construction' with regards to transport.

Mitigation

10.132 Construction dust and fine particulate matter mitigation measures have been identified to be included within an AQDMP to be agreed with LBW.

10.133 The effects of Development traffic and the relocation of the bus turnaround are judged to be not significant. No additional traffic mitigation is therefore proposed.

10.134 The Development is compliant with the Air Quality Neutral requirement of the SPG in relation to transport emissions. This shows that adequate mitigation against increasing road traffic emissions has been taken into account in the design of the Development.

Conclusion

10.135 Overall, there are no air quality constraints to the Development.

10.136 Table 10.21 contains a summary of the likely significant effects of the Development.

Table 10.21: Table of Significance – Air Quality

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Dust deposition and elevated PM_{10} concentrations	Temporary	Not Applicable	Standard high risk mitigation measures from the SPG on 'the control of dust and emissions during construction and demolition' to be applied.							*	Not significant in relation to proposed and existing human health receptors and ecological receptors.
Elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations from construction traffic	Temporary	Not Significant	No direct mitigation required.							*	Not significant in relation to existing human health receptor and ecological receptors.
Completed Development											
Elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations from operational traffic and relocation of the bus turnaround	Permanent	Not Significant	No direct mitigation required.							*	Not significant in relation to proposed and existing human health receptor and ecological receptors.
Cumulative Effects											
Construction											
Dust deposition and elevated PM_{10} concentrations	Temporary	Not Applicable	Standard mitigation measures from the SPG on 'the control of dust and emissions during construction and demolition' to be applied.							*	Not significant in relation to proposed and existing human and ecological receptors.
Operation											
Elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations from operational traffic	Permanent	Not Significant	No direct mitigation required							*	Not significant in relation to proposed and existing human and ecological receptors.

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 11 Noise and Vibration

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11. NOISE & VIBRATION

Introduction

11.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of Noise & Vibration.

Policy Context

National Planning Policy Framework[1]

11.2 The main national guidance document for Local Planning Authorities is the National Planning Policy Framework (NPPF).

11.3 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The published 2012 version has since been superseded in February 2019.

11.4 The NPPF does not contain assessment criteria, instead providing a series of policies, giving local authorities the flexibility in meeting the needs of local communities. The NPPF states:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by [...] preventing new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by unacceptable levels of […] noise pollution".*

11.5 Paragraph 180 states:

> *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason".*

11.6 Furthermore, Paragraph 182 states:

> *"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed".*

11.7 Reference is made in the NPPF to the Department for Environment, Food and Rural Affairs (DEFRA) 2010 *Noise Policy Statement for England* (NPSfE).

11.8 The NPSfE is intended to apply to all forms of noise other than that which occurs in the workplace, and includes environmental noise and neighbourhood noise in all forms.

11.9 The NPSfE advises that the effect of noise should be assessed on the basis of negative and significant negative effect, but does not provide any specific guidance on assessment methods or limit sound levels.

11.10 This lack of numeric limit sound levels is a direct consequence of the advice also contained in the NPSfE which is that it is not possible to have "*a single objective noise-based measure that is applicable to all sources of noise in all situations*".

11.11 It further advises that the sound level at which a negative effect occurs is "*likely to be different for different noise sources, for different receptors and at different times*". In the absence of specific guidance within the NPPF and NPSfE for the assessment of environmental noise, it is considered appropriate to base assessment on LPA requirements, current British Standards and national and international guidance (as described later in this Chapter). However, one noteworthy advisory point in the NPSfE is the need to place into context any general requirements that increases in ambient noise should be 'minimised'.

Noise Policy Statement for England (NPSE), 2010[2]

11.12 The Noise Policy Statement for England is published by the Department for Environment, Food and Rural Affairs (Defra) and sets out the approach to noise within the Government's sustainable development strategy.

11.13 The significance of impacts from noise within the NPSE are defined as follows. There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

11.14 Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

11.15 The three aims of the NPSE are stated as:

- Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Strategic Planning Policy

London Plan (2016)[3]

11.16 Policy 7.15 of the London Plan Policy states that the strategic plan for London seeks to manage noise by:

a) avoiding significant adverse noise impacts on health and quality of life as a result of new development;
b) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens on existing businesses;
c) improving and enhancing the acoustic environment and promoting appropriate

soundscapes (including Quiet Areas and spaces of relative tranquillity);

d) separating new noise sensitive development from major noise sources (such as road, rail, air transport and some types of industrial development) through the use of distance, screening or internal layout – in preference to sole reliance on sound insulation;

e) where it is not possible to achieve separation of noise sensitive development and noise sources, without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through the application of good acoustic design principles;

f) having particular regard to the impact of aviation noise on noise sensitive development;

g) promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver.

11.17 The emerging London Plan (The Spatial Development Strategy for Greater London) which has been published in December 2017 as a draft for public consultation (but is a material planning consideration), sets out the main guidelines for the control and management of the impacts of noise-generating activities on a wider scale which are developed within Policy D13 Noise, in consonance with the aforementioned principles included in the 2016 Plan.

Local Planning Policy

Wandsworth Local Plan (2016)[4]

11.18 Policy DMS1 'General development principles' within the Wandsworth Local Plan states:

> *Planning permission will be granted for developments which comply with the following criteria where relevant:*
>
> *a) use a design-led approach to optimise the potential of sites so that the layout and arrangement of buildings ensure a high level of physical integration with their surroundings;*
> *b) ensure that the scale, massing and appearance of the development provides a high quality, sustainable design and layout, that contributes positively to local spatial character;*
> *c) does not harm the amenity of occupiers/users and nearby properties through unacceptable noise, vibration, traffic congestion, air pollution, overshadowing, overbearing, unsatisfactory outlook, privacy or sunlight/daylight;*
> *d) are sympathetic to local landscape characteristics and avoid, remedy or mitigate any impact on natural features, open spaces and identified views;*
> *e) ensure that development takes account of existing or planned social and transport infrastructure and contributes to additional infrastructure where necessary, so that 13 Local Plan - Development Management Policies Document (Adopted March 2016) development is adequately served by public transport and a range of community facilities;*

f) are adequately serviced with utility infrastructure related and appropriate to the development including water supply, sewerage, waste management, telecommunications, broadband, heat, power and cooling;
g) are designed to reduce the need to travel and minimise car use;
h) include waste and recycling storage facilities on-site unless there are exceptional circumstances, in which case off-site provision will be sought;
i) are accessible to people with disabilities;
j) are designed to provide a safe and inclusive environment which maximises personal safety and minimises opportunities for crime and antisocial behaviour including terrorist activities;
k) take into account the operational needs of existing businesses and do not prejudice the existing uses/operations;
l) minimise light pollution and reduce harmful effects on neighbours and wildlife;
m) contribute towards a healthy neighbourhood and consider the health impacts of development. The requirement for a Health Impact Assessment will be determined at pre-application stage;
n) in the case of development involving hazardous substances or processes, and development in the vicinity of sites where hazardous substances are used, stored or transported, it can be shown that users of the site, occupants of neighbouring land and the environment will be adequately protected from any additional risk to health and safety;
o) the layout, design, paving and furnishing of public spaces reflects the character and appearance of surrounding buildings, and is designed so as to minimise street clutter, obstruction and visual intrusion. Proposals to reduce street clutter will be supported.

Legislative Context

IEMA Guidelines for Environmental Noise Impact Assessment: 2014[5]

11.19 The Institute of Environmental Management and Assessment (IEMA) have produced a set of guidelines which is applicable to any scale of development and provides outline guidance through areas of scoping, establishing the baseline and identifying noise impacts.

11.20 The guidelines attempt to bridge the gap between policy and other guidance documents such as BS 8233 and WHO Guidelines.

British Standard 7445-1:2003 - Description and measurement of environmental noise - Guide to quantities and procedures[6]

11.21 The three-part British Standard, BS 7445, provides the framework within which environmental noise should be quantified. Part 1 provides a guide to quantities and procedures and Part 2 provides a guide to the acquisition of data pertinent to land use. Part 3 provides a guide to the application of noise limits. BS 7445 also refers to a further standard, BS EN 61672-1:2013 'Electroacoustics. Sound level meters. Specifications', which prescribes the equipment

necessary for such measurements.

11.22 Whilst BS 7445 does not prescribe the meteorological conditions under which noise measurements should or should not be taken, it does (part 2, para 5.4.3.3) recommend that in order "…to facilitate the comparison of results (measurements of noise from different sources), it may be necessary to carry out measurements under selected meteorological conditions which are reproducible and correspond to quite stable propagation conditions." These conditions include:

- Wind speed not exceeding 5 m/s (measured at a height of 3 to 11 m above the ground);
- No strong temperature inversions near the ground; and
- No heavy precipitation.

BS 5228-1: 2009+A1:2014 - Code of Practice for noise and vibration control on construction and open sites – Noise[7]

11.23 Construction phase noise impacts arising from equipment, vehicular movements and activities related to the demolition a site and construction of a proposed development have the potential for a short-term impact on noise sensitive receptors in the vicinity of the Site. These impacts are assessed by calculating the change in ambient noise level ($L_{Aeq,T}$) as a result of such activities using the methods described by BS 5228-1. To do this, noise emissions from various anticipated construction activities are calculated.

11.24 BS 5228-1 provides example criteria, one of which is the '5 dB Method'. This method states that noise levels generated by construction shall not increase the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB LAeq, T from construction noise alone, for the daytime (07.00-19.00), evening (19.00-23.00) and night-time periods (23.00-07.00), respectively. These limits relate to noise levels for a duration of one month or more, unless noise would be considered significant for less than one month.

11.25 Works for a shorter duration that might result in a significant effect are considered by using the trigger levels for sound insulation and time criteria from Annex E.4 of BS 5228-1.

11.26 Exceedance of identified levels as shown in Table 11.1 trigger a responsibility on the developer to provide noise insulation. The standard suggests that noise insulation should be provided if the trigger levels in Table 11.1 (or a noise level 5 dB above the existing noise level, whichever is higher) are predicted to be exceeded for a period of ten or more days of working in any

fifteen consecutive days, or for a total of days exceeding 40 in any six month period.

Table 11.1: Criteria for assessing eligibility for noise insulation

Time	Relevant Time Period	Averaging Time, T	Noise Trigger Level dB $L_{Aeq, T}$ [1)]
Monday to Friday	07.00 – 08.00	1 h	70
	08.00 – 18.00	10 h	75
	18.00 – 19.00	1 h	70
	19.00 – 22.00	3 h	65
	22.00 – 07.00	1 h	55
Saturday	07.00 – 08.00	1 h	70
	08.00 – 13.00	5 h	75
	13.00 – 14.00	1 h	70
	14.00 – 22.00	3 h	65
	22.00 – 07.00	1 h	55
Sunday & Public Holidays	07.00 – 21.00	1 h	65
	21.00 – 07.00	1 h	55
Note 1 - Equivalent continuous A-weighted noise level predicted or measured at a point 1m in front of the most exposed windows or doors leading directly to a habitable room (living room or bedroom) in an eligible dwelling.			

11.27 BS 5228-1 continues to state within the example criteria, that temporary re-housing, or a reasonable cost thereof, would be offered by the developer where noise levels are 10 dB above any of the trigger levels presented in Table 11.1 (or a noise level 10 dB above the existing noise level, whichever is higher).

BS 5228-2: 2009+A1: 2014 - Code of Practice for noise and vibration control on construction and open sites – Vibration[8]

11.28 BS 5228-2 provides guide values to prevent cosmetic damage to property. Between 4 Hz and 15 Hz, a guide value of 15 - 20 mms^{-1} is recommended for unreinforced and residential property, whist above 40 Hz the guide value is 50 mms^{-1}. In the lower frequency region strains associated with a given vibration are higher and therefore result in a lowering of the threshold criteria.

Table 11.2: Criteria for assessing eligibility for noise insulation

Line	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures	50 mms^{-1} at 4 Hz and above	
	Industrial and heavy commercial buildings		
2	Unreinforced or light framed structures	15 mms^{-1} at 4 Hz increasing to 20 mms^{-1} at 15 Hz	20 mms^{-1} at 15 Hz increasing to 50 mms^{-1} at 40 Hz and above
	Residential or light commercial buildings		
Note 1 – values referred to are at the base of the building; *Note 2 – for line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.*			

International Standard ISO 9613-2: 1996[9]

11.29 International Standard: ISO 9613-2: 1996(E): "Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation" enables the prediction of noise levels in the community from sources of known sound emission.

11.30 The noise prediction method described in this part of the standard is general and is suitable for a wide range of engineering applications where the noise level outdoors is of interest. The noise source(s) may be moving or stationary and the method considers the following major mechanisms of noise attenuation:

- Geometrical divergence (also known as distance loss or geometric damping);
- Atmospheric absorption;
- Ground effect;
- Reflection from surfaces; and
- Screening by obstacles.

11.31 The method predicts noise levels under metrological conditions favourable to noise propagation from the sound source to the receptor, such as downwind propagation, or equivalently, propagation under a moderate ground based temperature inversion as commonly occurs at night.

11.32 The propagation algorithms described in ISO 9613-2 are implemented into the three dimensional noise modelling software package SoundPLAN v7.4, which has been used to undertake the propagation calculations for this assessment.

BS 8223: 2014 - Guidance on sound insulation and noise reduction for buildings[10]

11.33 BS 8223 contains guidance and acoustic design criteria for regulators and developers to reference during the construction or redevelopment of different occupied buildings. Amongst other information, the standard provides internal noise recommendations that represent acceptable living or working environments, and external area amenity criteria. BS 8233 recommends the following design criteria for residential dwellings.

Table 11.3: BS 8233 Internal ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping (Daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

11.34 The design target levels provided in BS 8233 represent the desired internal residential noise levels for a variety of different scenarios related to steady state (averaged) noise. The design target thresholds are based over a time base and reflect existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. The range in noise targets represent the sensitivity of both daytime (07:00 – 23:00) and night-time (23:00 – 07:00) situations whereby the most restrictive targets are understandably set for the night period where an occupant requires sleep.

11.35 BS 8233 also provides design criteria for external noise and Section 7.7.3.2 states:

> "*For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.*"

11.36 BS 8233 also provides design targets for non-residential receptors such as libraries. The Development provides provision for a library space within the ground floor of Block A, to the far north of the village square. The appropriate guidance for this space is reproduced below:

Table 11.4: BS 8233 Internal ambient noise levels for dwellings and commercial space

Activity	Location	Design range / dB $L_{Aeq, T}$
Study and work requiring concentration	Library, gallery, museum	40 - 50

BB93 Acoustic design of schools: Performance standards, 2015[11]

11.37 Building Bulletin 93 (BB93) sets out minimum performance standards for acoustics of school buildings and nursery space and describes the normal means of demonstrating compliance with Building Regulations. The Building Regulations require that all spaces should meet the performance standards for indoor ambient noise level, airborne and impact sound insulation and reverberation time.

11.38 Indoor ambient noise criteria, pertinent to the proposed Eastwood Children's Centre and Nursery at Portswood Place (part of the Development) are reproduced below:

Table 11.5: Noise activity and sensitivity levels and upper limits for indoor ambient noise level in schools

Type of room	Room classification for the purpose of airborne sound insulation		Upper limit for the indoor ambient noise level / $L_{Aeq, 30mins}$ dB	
	Activity noise (source room)	Noise tolerance (receiving room)	New build	Refurbishment
Nursery school rooms *Primary school:* classroom, class base, general teaching area, small group room *Secondary school:* classroom, general teaching area, seminar room, tutorial room, language laboratory	Average	Medium	35	40
Administration and ancillary spaces: Office	Low	Medium	40	45

World Health Organisation: Guidelines for Community Noise, 1999[12]

11.39 The 1999 World Health Organisation (WHO) 'Guidelines for Community Noise' state that in a dwelling the critical effects of noise are on annoyance, speech interference and sleep. The Guidelines present a set of values for the onset of health effects from noise exposure within specific environments. The guideline values are typically set based upon the lowest levels of noise that affect health (critical health effect) for general populations.

11.40 In relation with night noise, this document states the following:

> *"For a good night's sleep, the equivalent sound level should not exceed 30 dB(A) for continuous background noise, and individual noise events exceeding 45 dB(A) should be avoided. In setting limits for single night-time noise exposures, the intermittent character of the noise has to be taken into account. This can be achieved, for example, by measuring the number of noise events, as well as the difference between the maximum sound level and the background sound level. Special attention should also be vibrations; and to noise sources with low-frequency components".* In relation with the analysis of short events during night; *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB LAmax more than 10–15 times per night".*

Professional Practice Guidance on Planning and Noise, 2017[13]

11.41 The Professional Practice Guidance on Planning and Noise (ProPG) is written to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England. The Chartered Institute of Environmental Health (CIEH), Institute of Acoustics (IOA) and the Association of Noise Consultants (ANC) have worked together to produce the guidance which encourages better acoustic design for new residential development and aims to protect people from the harmful effects of noise. This Professional Practice Guidance is based on the best knowledge available at the time of publication.

BS4142: 4142:2014 - Methods for rating and assessing industrial and commercial sound[14]

11.42 BS4142 provides a methodology for assessing industrial noise against ambient background noise levels. A comparison of the difference between the background and rating levels (the noise from the identified industrial source), with additional corrections for tonality, intermittency, impulsivity and other sound characteristics, as predicted at the nearest residential receptor (using methodology provided within ISO 9613) indicates the likelihood of adverse effect; typically, the greater this difference, the greater the magnitude of the effect;

- A difference of around +10 dB or more indicates that significant adverse impacts are likely;
- A difference of around +5 dB is likely to be an indication of an adverse impact;
- Where the rating level does not exceed the background sound level (a difference of 0 dB or less), this is an indication of the specific sound source having a low impact.

11.43 After discussions with the Environmental Services Officer at LBW (on 21st November 2017), fixed plant noise should seek to generate noise levels at nearest sensitive receptors that is 10 dB(A) below the existing background noise.

Calculation of Road Traffic Noise, 1988[15]

11.44 The 'Calculation of Road Traffic Noise' (CRTN) produced by the Department of Transport / Welsh Office provides a method for the prediction of noise from road traffic.

11.45 The prediction method uses two-way, 18-hour, Annual Average Weekday Traffic (AAWT) flows for road links and with corrections for speed, road surface, road gradient and screening to determine the $L_{A10,\ 18\ hour}$ noise level at a reference distance of 10 metres from the edge of the nearside carriageway of the road.

11.46 The 2006 DEFRA update to CRTN, 'Method For Converting The UK Road Traffic Noise Index $L_{A10,18h}$ to The EU Noise Indices For Road Noise Mapping', is a guide for converting the calculated $L_{A10,18hour}$ value into L_{day}, $L_{evening}$ and L_{night} values. The calculation procedure has been incorporated in the noise model to determine the L_{night} noise levels at each receptor.

Design Manual for Roads and Bridges – Part 7 HD 213/11, 2011[16]

11.47 The assessment is based on the procedure set out in the Design Manual for Roads and Bridges (DMRB) document for a 'detailed' assessment of road traffic noise impacts. The assessment covers both the magnitude and significance of any change as a result of any new or amended highway scheme however is relevant for noise assessment of other project types. DMRB refers specifically to noise impacts and as such will be discussed in these terms for the purposes of this assessment.

11.48 A significant change is defined as an increase in the 18-hour traffic flow which is equal or greater than 25%, or a decrease which is equal or greater than 20%. Changes of this magnitude are equivalent to a change in noise level of at least 1 dB.

11.49 The magnitude of noise impact is therefore assessed by comparing the increase and decrease in noise levels between both short term and long-term scenarios. DMRB defines this impact both in the short term (immediate impact) and long term (future impact).

Table 11.6: DMRB criteria for determining magnitude of impact in the short-term

DMRB criteria for determining magnitude of impact in the short-term	
Change in noise level $L_{A10,18hr}$	Magnitude of impact
0 dB	No change
0.1 – 0.9 dB	Negligible
1 – 2.9 dB	Minor

DMRB criteria for determining magnitude of impact in the short-term	
Change in noise level $L_{A10,18hr}$	Magnitude of impact
3 – 4.9 dB	Moderate
5 dB or more	Major

Table 11.7: DMRB criteria for determining magnitude of impact in the long-term

DMRB criteria for determining magnitude of impact in the long-term	
Change in noise level $L_{A10,18hr}$	Magnitude of impact
0 dB	No change
0.1 – 2.9 dB	Negligible
3 – 4.9dB	Minor
5 – 9.9 dB	Moderate
10 dB or more	Major

11.50 The study area for the traffic noise assessment is consistent with that within ES Chapter 9: transport and access. Those roads likely to be impacted by the Development have been utilised for assessment purposes.

Assessment Methodology

Consultation

11.51 Discussions with the Environmental Services Officer at London Borough of Wandsworth (LBW) were sought to agree the scope and methodology of the assessment. The baseline survey methodology was approved on 24th October 2017.

11.52 Further discussions were sought with LBW on 21st November 2017 and 12th February 2019 in order to obtain their specific requirements for noise thresholds, including the design target thresholds for internal spaces and proposed outdoor amenity areas of the Development. The Environmental Services Officer advised that the internal criteria within BS 8233: 2014 would need to be met and due to the proposed areas being dominated by road traffic noise, assigning a fixed criterion to these outdoor areas would not be applicable in this instance. In line with the requirements of BS 8233, the use of these outdoor spaces would outweigh their removal, with the onus being on good acoustic design of the proposed amenity spaces.

11.53 Based on the agreements sought with LBW, the assessment methodologies for construction and operational phases of the Development are reproduced below.

Construction Phase

11.54 At this stage, detailed construction methodologies and plant lists are not available. The assessment therefore concentrates on potential noise criteria in line with BS 5228 for such works and methods of mitigation.

11.55 Construction vibration has not been assessed at this stage. During construction, the likely activity to cause vibration is piling during the foundation stage. Special consideration should be given to the piling method selection in order to incorporate the risks, mitigation and control measures into the Construction Environmental Management Plan (CEMP). Rotary bored piling offers a better noise and vibration performance in relation to driven or pressed-in techniques. When setting targets for maximum vibration levels, reference would need to be made to the criteria contained within BS 5228. At this stage, it is considered that vibration is unlikely to cause significant effect and it has therefore been scoped out for the purposes of this assessment.

Construction Traffic

11.56 Given the proximity to relatively busy roads, the noise associated with construction traffic is likely to be low in comparison to existing road traffic noise. In addition, construction related traffic will primarily be restricted to daytime periods only and as such, potential effects would be reduced. An indicative assessment based on existing traffic flows has therefore been undertaken as a means to indicate the potential for exceedance of the relevant criteria.

Operational Road Traffic

11.57 Traffic flow data for the various development scenarios have been provided by the project's transport consultants. In accordance with DMRB, data has been provided for 'without development' and 'with development'. Due to the difficulties in predicting traffic numbers + 15 years post development completion, the short-term effects have only been assessed. The significance of operational road traffic, in accordance with DMRB, is more stringent in the short term and therefore compliance with the short term would naturally comply with the criteria concerned with the long-term traffic impacts associated with the Development.

11.58 The feasibility of the bus turnaround area has been assessed, the significance of which has been compared against the existing measured noise levels and noise criteria for internal residential space in BS 8233. The assessment assumes the preferred option would be to move the turnaround area from its current position at Minstead Gardens to Tunworth Crescent.

Fixed Plant Noise

11.59 Fixed plant noise from the Development will be assessed in line with BS 4142:2014. At this stage, the amount, positioning and type of any potential fixed plant is unknown; therefore criteria at nearest receptor locations to the proposed Eastwood Children's Centre and Nursery at Portswood Place, based on the results of the baseline monitoring have been provided assuming any such plant would be positioned on the outside of the building.

Site Suitability

11.60 The suitability of the Development for residential accommodation has been assessed in line with the relevant internal design targets in BS 8233 and WHO for daytime and night time (including maximum noise levels).

11.61 The proposed relocation of the library has also been assessed in line with the design targets for non-residential buildings within BS 8233.

11.62 The proposed Eastwood Children's Centre and Eastwood Nursery at Portswood Place aims to provide learning space and a children's centre. The proposals include provision for learning facilities for preschool, infants and toddlers, plus external play space and offices. The criteria from BB93 have been applied in this instance.

11.63 The proposed re-distribution of the village square in front of proposed Block A has also been assessed. The results of the modelling have been assessed against existing levels in the current village square and requirements of LBW. The village square incorporates planting buffers through design; no additional mitigation has been assumed.

Computer Modelling

11.64 A computer noise model of the Development has been constructed using SoundPLAN (v7.4) noise prediction software. The baseline noise model is calibrated in-line with measured noise levels for day and night time periods. The model parameters are included in Appendix 11.4.

Significance

11.65 This noise and vibration chapter has used a topic specific assessment framework for assessing the significance of effect. The following text and tables define the receptor sensitivity and magnitude of effects that are used to determine the significance of effect outlined in this chapter.

Value of Receptor Sensitivity

11.66 The example for sensitivity within the IEMA Noise Assessment Guidelines (as noted at para 11.20) has been followed to provide the criteria for sensitivity as follows.

Table 11.8: Receptor Sensitivity

Sensitivity	Criteria
High	Receptors where occupants or activities are particularly susceptible to noise. Examples include: residences, quiet outdoor areas used for recreation, conference facilities, auditoria/studios, schools in daytime, hospitals/residential care homes and religious institutions e.g. churches or mosques.
Medium	Receptors moderately sensitive to noise, where it may cause some distraction or disturbance. Examples include: offices, restaurants and sports grounds where spectator noise is not a normal part of the event and where quiet conditions are necessary (e.g. golf or tennis).
Low	Receptors where distraction or disturbance from noise in minimal. Examples include residences and other buildings not occupied during working hours, factories and working environments with existing high noise levels and sports grounds where spectator noise is a normal part of the event.

11.67 The area surrounding the Development is predominantly residential. As residences are classed as being of the highest sensitivity, these would be the governing receptors in terms of impact. Therefore, for the purposes of the assessment of noise, all residential receptors are considered as being of 'high' sensitivity.

Magnitude of Effect

11.68 The 'magnitude of effect' is used to describe a numerate impact in effect terms and is used differently for each of the various aspects of change to the noise environment. Table 11.9 presents a summary of the criteria for effect:

Table 11.9: Magnitude of effect criteria

Effect	Criteria				
	Construction Noise	Construction Traffic Noise	Road Traffic (Short Term)	Bus Turnaround	Fixed Plant Noise
Major	Exceedance of Noise Insulation Trigger requirements	Change in $L_{A10,\ 18\ hour}$ of 5.0 dB or more	Change in $L_{A10,\ 18\ hour}$ of 5.0 dB or more	Change in $L_{Aeq,\ T}$ of 5.0 dB or more	10 dB or more above existing background noise (L_{A90})
Moderate	Exceedance of Noise Thresholds for more than 1 month	Change in $L_{A10,\ 18\ hour}$ of 3.0 - 4.9 dB	Change in $L_{A10,\ 18\ hour}$ of 3.0 - 4.9 dB	Change in $L_{Aeq,\ T}$ of 3.0 -4.9 dB	5-9.9 dB above existing background noise (L_{A90})

Effect	Criteria				
	Construction Noise	Construction Traffic Noise	Road Traffic (Short Term)	Bus Turnaround	Fixed Plant Noise
Minor	Exceedance of Noise Thresholds for less than 1 month	Change in $L_{A10, 18\ hour}$ of 1.0 - 2.9 dB	Change in $L_{A10, 18\ hour}$ of 1.0 - 2.9 dB	Change in $L_{Aeq, T}$ of 1.0-2.9 dB	3-4.9 dB above existing background noise (L_{A90})
Negligible	No exceedance of Noise Thresholds	Change in $L_{A10, 18\ hour}$ of 0.1 - 0.9 dB	Change in $L_{A10, 18\ hour}$ of 0.1 - 0.9 dB	Change in $L_{Aeq, T}$ of 0.1 -0.9 dB	0.1-2.9 dB above existing background noise (L_{A90})

Significance of Effect

11.69 The nearest receptors to the Development are residential properties; therefore in line with the IEMA Guidance (Table 11.8) the sensitivity of these receptors for the purposes of this assessment is classed as 'high'.

11.70 As this assessment considers one level of sensitivity, the normal approach to significance cross referencing sensitivity and magnitude of impact has been substituted with a dual approach. Impacts are considered significant if the magnitude of effect is either moderate or major as per Table 11.10 below. Mitigation will be applied where a significant effect has been assessed.

Table 11.10: Matrix of Significance

		Sensitivity of receptor/ Receiving Environment to Change/ Effect		
		High	Medium	Low
Magnitude of Change/ effect	Major	Major Adverse/Beneficial	Major - Moderate Adverse/Beneficial	Moderate - Minor Adverse/Beneficial
	Moderate	Major - Moderate Adverse/Beneficial	Moderate – Minor Adverse/Beneficial	Minor Adverse/Beneficial
	Minor	Moderate - Minor Adverse/Beneficial	Minor Adverse/Beneficial	Minor Adverse/Beneficial - Negligible
	Negligible	Negligible	Negligible	Negligible

11.71 The LOAEL and SOAEL for each aspect of the assessment have been based on relevant guidance documents and example criteria from recent and similar projects. Based on the magnitude of effect (Table 11.9) and in line with NPSE, a LOAEL would occur where there is an exceedance of the minor effect level and SOAEL where these is an exceedance of the major

effect level for receptors that are of high sensitivity.

Limitations and Assumptions

11.72 At this stage, specific details of the locations and noise levels of any fixed plant is unknown, therefore a conclusive assessment of noise from any proposed building services plant cannot be undertaken. Proposed noise limits at those nearest receptors to the proposed Eastwood Children's Centre have been included which provide a set of criteria that the fixed plant should be designed to in order to meet the requirements of LBW.

11.73 The bus timetable, obtained from the stand at Danebury Avenue (Minstead Gardens) has been used to inform the assessment in terms of the likely number of buses using the proposed bus turnaround area at Tunworth Crescent. The bus timetable provides a range of times in which the buses for each route are due to leave the stand (for example, every 6 – 10 minutes); in order to provide a worse case assessment the lower time frame has been utilised during both daytime (07:00 – 23:00) and night (23:00 – 07:00) periods which assumes a higher number of movements. Observations of the type of buses used for each route (for example single deck diesel, double deck hybrid) were also made and the same split has been applied.

Baseline Conditions

11.74 A baseline noise level survey was undertaken between Tuesday 7th and Wednesday 8th November 2017. Five long term noise monitoring stations were installed at various positions within and to the extremities of the Development in order to measure the noise environment throughout the Site from the intervening noise sources during a 24 hour period. Seven additional shorter term measurements (ranging between 1 – 12 hours) were undertaken in order to quantify specific noise sources.

11.75 The measurement locations and main noise sources observed during the monitoring are described in Table 11.11.

Table 11.11: Noise Monitoring Locations – Summary (7th - 8th November 2017)

ID	Type	Location	Noise Sources
LT1	Long Term	To the east of Sherfield Gardens, on the grassed area	Road traffic sources along Danebury Avenue, Sherfield Gardens and Highcliffe Drive. Intermittent aircraft movements and pedestrians.
LT2		To the south of Clarence Lane, approx 3 metres to the kerbside	Dominated by road traffic along Clarence Lane and to a lesser degree Highcliffe Drive.

ID	Type	Location	Noise Sources
LT3		To the west of Roehampton Lane, 1 metre from kerbside	Dominated by road traffic along Roehampton Lane. Pedestrian activity also audible.
LT4		On grassed area to the north of Danebury Avenue, opposite the Mount Angelus Road roundabout	Dominated by road traffic along Danebury Avenue and Harbridge Avenue. Intermittent aircraft movements and pedestrians.
LT5		Far south of Minstead Gardens on grassed area, opposite properties	Vehicle movements along A3 and intermittent movements through Minstead Gardens. Intermittent aircraft movements.
ST6	Short Term	3 metres south of Roehampton Lane kerbside, at the extremity of proposed village squarearea	Dominated by road traffic along Roehampton Lane and Danebury Avenue. Pedestrian activity.
ST7			
ST8		East of shops, off Cleve Way	Dominated by road traffic along Danebury Avenue. Pedestrian activity.
ST9		Grassed area to the north of Hurstbourne House	Vehicle movements along Roehampton Lane. Intermittent aircraft movements and pedestrians.
ST10		West of Kingsclere Close, on grassed area next to Ellisfield Drive	Vehicle movements along Roehampton Lane, Ellisfield Drive and Kingsclere Close. Intermittent aircraft movements and pedestrians.
ST11		Grassed area, south of Tunworth Crescent	Vehicle movements along Danebury Avenue and Tunworth Crescent. Intermittent aircraft movements.

Survey Measurement Equipment

11.76 A total of seven noise monitors were utilised for the survey. The calibration of the meters was checked before and after the measurements, using an acoustic calibrator at 94 dB, at 1 kHz. No significant calibration drift (+/- 0.5 dB) was noted between commencement and completion of the monitoring. Details of the equipment used is provided below:

Table 11.12: Noise Measurement Equipment

Equipment	Type	Serial Number
Class 1 Sound Level Meter	Rion NL-32	00403193
		00903343
		01213704
	Rion NL-52	00453832
		00453835
		01021276
	Svantek 977	36144
Acoustic Calibrator	Rion NC-74	34736262
		34857332

11.77 The sound level meters used, conform to the requirements of BS EN 61672-1: 2013

Electroacoustics. Sound level meter, Specifications. The calibrator used, conforms to the requirements of BS EN 60942: 2003 Electroacoustics, Sound calibrators. The equipment used, has a calibration history that is traceable to a certified calibration institution.

Monitoring Conditions

11.78 Conditions during the monitoring were noted at the beginning of the survey, during and on collection of the equipment, as being 11^{O}C during daytime periods and dropping to between 6 – 7^{O}C at night. There was light precipitation during the evening monitoring period and into the early night, but was not deemed sufficient to affect the measurements. The wind speed was between 0 – 1 ms^{-1} during the entire measurement period.

Noise Measurement Results

11.79 The following tables show the resultant noise level results measured at each location.

Table 11.13: Noise Monitoring Results – Summary (7th - 8th November 2017)

Location	Time Period	$L_{Aeq, T}$ dB	$L_{A10, T}$ dB	$L_{A90, T}$ dB	$L_{AFmax, T}$ dB*
LT1 – Sherfield Gardens	Daytime (07:00-23:00)	55.0	57.8	48.2	79.6
	Night time (23:00-07:00)	50.7	51.0	40.0	77.5
LT2 – Clarence Lane	Daytime (07:00-23:00)	66.2	69.2	52.0	91.4
	Night time (23:00-07:00)	60.4	57.8	43.4	78.0
LT3 – Roehampton Lane	Daytime (07:00-23:00)	74.8	77.6	63.0	106.7
	Night time (23:00-07:00)	71.2	73.7	49.5	89.2
LT4 – Danebury Avenue	Daytime (07:00-23:00)	64.1	67.4	50.1	99.4
	Night time (23:00-07:00)	59.6	58.1	41.0	81.5
LT5 – Minstead Gardens	Daytime (07:00-23:00)	55.4	57.2	48.2	85.4
	Night time (23:00-07:00)	50.8	49.9	41.3	73.6

** Maximum monitored noise level during survey period*

11.80 Long term noise monitoring (encompassing a minimum 24 hour period) was conducted at strategic positions across the Development. Monitoring data is provided in Appendix 11.1.

11.81 The highest noise levels were observed adjacent to the dominant road sources, which were the single highest source of noise levels across the Site. Those sources included vehicles along Roehampton Lane, Danebury Avenue and Clarence Lane.

11.82 Additional short-term measurements were also undertaken where access and security did not permit the noise equipment to be positioned for extended periods of time. The attended

measurements were undertaken for a minimum 1 hour period at each location, with the aim of quantifying the existing noise at positions which represent those buildings or space as part of the Development. For example, the Village Square at Roehampton Lane and Eastwood Children's Centre and Nursery off Danebury Avenue. With agreement from LBW, the monitoring was undertaken during the perceived highest noise levels during times of so called 'rush hour' traffic at locations ST7 – ST10.

Table 11.14: Attended Noise Monitoring Results - Daytime

Location	Daytime						
	Date	Start Time (hh:mm)	Duration (hh:mm)	$L_{Aeq, T}$ dB	$L_{A10, T}$ dB	$L_{A90, T}$ dB	$L_{AFmax, T}$ dB*
ST7	08.11.17	06:56	12:04	72.7	75.0	62.3	99.8
ST8	08.11.17	07:19	01:05	60.5	63.5	52.4	78.4
ST9	08.11.17	08:30	01:00	56.8	59.0	50.4	76.9
ST10	08.11.17	09:36	01:00	57.3	59.4	53.0	70.8
ST11	08.11.17	12:07	01:02	55.6	58.2	47.8	75.7
ST12	07.11.17	15:06	01:00	63.0	65.0	49.5	88.0

** Maximum monitored noise level during survey period*

Table 11.15: Attended Noise Monitoring Results - Night

Location	Night						
	Date	Start Time (hh:mm)	Duration (hh:mm)	$L_{Aeq, T}$ dB	$L_{A10, T}$ dB	$L_{A90, T}$ dB	$L_{AFmax, T}$ dB*
ST6	08.11.17	00:20	01:00	68.1	72.0	54.5	82.8

** Maximum monitored noise level during survey period*

11.83 Noise measurements of specific bus turnaround movements were obtained at the current turnaround area at Minstead Gardens and are provided in Table 11.15. Source measurements were obtained from bus numbers 170 and 430 during daytime periods which included both single and double decker types, operating under diesel and electric power. Measurements included entering, stationary and exiting noise within the turnaround area. The sound level meter was positioned at 2 metres from the bus at its closest position when stationary on the stand. The noise levels have been referenced to a sound exposure level (SEL) in order to inform the assessment. The sound exposure level (SEL) is the measure of A-weighted sound energy of the existing bus movements, occurring over a period of one second.

Table 11.16: Bus Noise Levels

Bus No.	Type / Power	Noise Level, LAeq, T	Measurement Time, secs	SEL, dB
170	Single decker - diesel	63.7	93	83.4
430	Hybrid double decker - diesel	63.5	45	80.0
430	Hybrid double decker - electric	60.4	59	78.1

Noise Model Validation

11.84 The road noise sources have been inputted into the computer noise model and calibrated with the long-term noise positions at LT1 – LT5 (24hours + noise monitoring locations) to validate the predictions. Differences between measured and predicted levels are presented in Table 11.18:

Table 11.18: Model and Monitoring Comparison

Location	Measured level, $L_{Aeq, T}$ dB		Predicted Level, $L_{Aeq, T}$ dB		Difference, dB	
	Day	Night	Day	Night	Day	Night
LT1 – Sherfield Gardens	55.0	50.7	55.1	50.2	- 0.1	0.5
LT2 – Clarence Lane	66.2	60.4	66.1	60.5	0.1	- 0.1
LT3 - Roehampton Lane	74.8	71.2	74.9	71.3	- 0.1	- 0.1
LT4 – Danebury Avenue	64.1	59.6	64.3	59.5	- 0.2	0.1
LT5 – Minstead Gardens	55.4	50.8	55.1	50.4	0.3	0.4

11.85 The comparison of modelled and measured data shows an extremely close correlation at all of the monitoring positions, particularly during the daytime period. The highest difference is obtained at position LT1 (Sherfield Gardens) where a difference of 0.5 dB(A) during the night period is calculated. Such a variation is considered to be insignificant, and the model is therefore deemed as a good representation of how the noise climate varies across the Development.

Future Baseline

11.86 It is considered that the future baseline at the identified receptors will be broadly similar to the existing baseline given the proximity/relationship of residential dwellings to the local road network.

Likely Significant Effects

11.87 The following sections identify the effects of the Development with regards to noise and assess their significance in the absence of mitigation (where appropriate).

Construction Phase

Construction Noise

11.88 The results of the noise monitoring has been used to determine existing ambient noise levels ($L_{Aeq, T}$) at the nearest noise sensitive receptors potentially affected by construction activity.

11.89 Construction works are not expected to take place outside of standard daytime periods (08:00-18:00 Monday to Friday, 08:00-13:00 Saturday). Construction noise categories have been determined based on the 'ABC Method' thresholds detailed within BS 5228. Baseline noise levels, their category and accompanying threshold criteria are detailed in Table 11.19:

Table 11.19 Baseline noise levels and threshold criteria

Receptor	Baseline Noise Level, $L_{Aeq, T}$	BS5228 Category	Threshold Criteria, $L_{Aeq, T}$
Properties along Roehampton Lane	74.8	C	78
Properties along Laverstock Gardens	64.1	B	70
Properties along Danebury Avenue	64.1	B	70
Properties along Harbridge Avenue	64.1	B	70
Properties along Cleve Way	64.1	B	70

11.90 Once the exact construction plant, phasing and timings have been determined, a further assessment would be considered in line with a Construction Noise and Vibration Management Plan (CNVMP). Based on the threshold criteria, it is likely that the criteria may be exceeded for short term periods but not for any significant length of time and not sufficient enough to exceed the criteria for a period of one month.

11.91 In addition, short term works are not expected to be sufficient to trigger the separate requirements for noise insulation. The effects of the construction works would therefore be of minor adverse significance.

Construction Traffic Noise

11.92 It is generally accepted that noise level changes of 3 dB(A) are the minimum perceptible under normal and stable environmental conditions. Hence large variations in traffic flow numbers are needed before any noticeable or perceived change in traffic noise occur. For example, a total traffic flow increase of 50% leads to a theoretical traffic noise increase of 1.8 dB, barely noticeable to the human ear, and less than the 3 dB considered as a significant

change by DMRB in reference to traffic noise assessments.

11.93 Traffic flows along Roehampton Lane (North of Rodway Road – two-way), which is assumed would be utilised for HGV/vehicular access in/out of the Development, is in excess of 29,000 vehicles (AAWT). As a result, the required contribution of construction traffic in order to increase existing noise levels by 1 dB would be c.7,500 additional vehicles. Construction traffic levels provided by the transport consultant indicates that an increase in of this magnitude is not expected as part of the Development proposals; the effect due to construction traffic would therefore be negligible.

Operational Phase

Fixed Plant Noise

11.94 The location of any fixed plant associated with the Eastwood Children's Centre and Nursery Development is currently undetermined; however any plant should be appropriately assessed prior to installation in order to meet the criteria contained in BS 4142: 2014 and the requirements of LBW.

11.95 According to BS 4142: 2014, where the rating noise level ($L_{Aeq,\ T}$) does not exceed the background sound level ($L_{A90,T}$), this is an indication of the specific sound source having a low impact. The requirement of LBW is more onerous in this regard and recommends that fixed plant should be designed to achieve L_{A90} – 10 dB. The baseline noise monitoring from LT 4 (Danebury Avenue) (refer to Figure 11.1) has been used to inform the assessment at each of the nearest receptors. This location was chosen due to the proximity of this noise meter to the potential noise sources from the Development.

11.96 Analysis of the baseline data, to inform receptor criteria from operational fixed plant has considered the most repeated hourly (statistical mode) noise level for daytime periods (07:00 – 23:00) and most repeated 15 minute value for night (23:00 – 07:00). Such an approach is in line with the requirements of BS 4142, and is considered to suitably represent the noise in the existing environment.

11.97 As a result of the requirements of LBW, any fixed plant (with all rating penalties) associated with the proposed Eastwood Children's Centre and Nursery at Portswood Place which may be positioned on the outside of the building should be designed in such a manner (L_{A90} – 10 dB) to not exceed the following noise level thresholds at nearest sensitive receptor to ensure the criteria is met:

Table 11.20: Fixed Plant Noise Assessment

No.	Sensitive Receptor	Daytime Noise Criteria / dB $L_{Aeq, T}$ *	Night Noise Criteria / dB $L_{Aeq, T}$ *
1	Nearest properties at Cleve Way	41	31
2	Nearest properties at Minstead Gardens	41	31
3	Brockbridge House	41	31

** To achieve L_{A90} – 10 dB*

11.98 At this stage it is unknown whether the proposed Eastwood Children's Centre would be operational during the night (23:00 – 07:00). Should the use of the Centre be operational during this period, the lower night time values should be used to inform the design of any fixed plant attached to the operation of this building. Assuming the noise criteria is adhered to as part of the design, the proposed fixed plant would have a negligible effect.

Road Traffic Noise

11.99 An assessment of road traffic noise impacts has been undertaken using the assessment criteria of DMRB HD 213/11 in the short term; based on the 2030 opening year traffic data.

11.100 The impact of operational traffic is considered to be of minor adverse significance when the predicted noise level exceeds 1 dB in the short term. Predicted noise level increases of less than this would be negligible.

11.101 Table 11.21 shows the predicted noise levels ($L_{A10, 18hr}$) in the short term, based on vehicle flow, %HGV's and road speed.

Table 11.21: Predicted Traffic Changes

Road	Short Term		
	Opening Year 2030 Base / $L_{A10,18h}$ dB	Opening Year Base 2030 + Development / $L_{A10,18h}$ dB	Difference / dB
A3 Kingston Rd E from A306	75.5	75.5	0.0
A3 Kingston Rd W from A306	76.2	76.2	0.0
Clarence Lane	66.4	66.4	0.0
Danebury Avenue	65.2	65.5	0.3
Ellsfield Drive	52.1	53.1	1.0
Harbridge Avenue	50.4	51.8	1.4
Kingsclere Close	56.5	57.2	0.7
Roehampton Ln N of Rodway Rd	72.0	72.0	0.0
Roehampton Ln N of Wanborough Dr	73.1	73.2	0.1

Road	Short Term		
	Opening Year 2030 Base / $L_{A10,18h}$ dB	Opening Year Base 2030 + Development / $L_{A10,18h}$ dB	Difference / dB
Upper Richmond Rd E from A306	70.9	70.9	0.0
Upper Richmond Rd W from A306	72.2	72.2	0.0

11.102 The predictions show that the effect of the Development (including those cumulative developments in the area) on traffic noise in the short term would increase noise levels by a maximum of 1.4 dB(A) along Harbridge Avenue. Using the DEFRA 2006 update to CRTN procedure, road traffic noise levels ($L_{A10, 18hr}$) along Harbridge Avenue are calculated to be 49.8 dB ($L_{Aeq, 16hr}$) during the daytime and 42.8 dB ($L_{Aeq, 8hr}$) at night. Such a noise level is below the existing measured baseline noise level in that area and any such increase in noise levels along that section of road would be imperceptible to future receptors. Similarly, the noise increase along Ellsfield Drive would be imperceptible when compared against the existing baseline noise environment.

11.103 The impact of the Development in terms of road traffic noise levels on existing and future receptors would be negligible.

Relocation of Bus Turnaround Area

11.104 The impact of bus turnaround movements at the proposed Tunworth Crescent is informed by the baseline noise measurements obtained at the existing turnaround location (Table 11.16) from a number of different vehicles/operations and prediction of daytime (07:00 – 23:00) and night-time (23:00 – 07:00) noise levels utilising the existing bus timetable at the current Danebury Avenue (Minstead Gardens) bus stand.

11.105 The bus routes, movement numbers and individual SEL's per bus type (i.e single deck, diesel) are provided in Table 11.22 below. The table also includes the calculated averaged noise level at a distance of 2 metres (provided in bold font), incorporating factors including source noise, bus type and number of movements per 16 hour daytime (07:00 – 23:00) and 8 hour night-time (23:00 – 07:00).

Table 11.22: Calculation per bus route

	Bus Route					Total
	170	430	639	670	N74	
Daytime Bus Movements (16hr)	146	140	8	6	0	300
Night Bus Movements (16hr)	27	25	0	0	8	60
Bus Type/Power	SD/D	DD/D	SD/D	SD/D	DD/E	

	Bus Route					Total
	170	430	639	670	N74	
Sound Exposure Level (SEL)	83.4	80.0	83.4	83.4	78.1	
Calculated Daytime Noise (16hr)	57.4	53.9	44.8	43.6	0.0	**59.2**
Calculated Night Noise (8hr)	53.1	49.4	0.0	0.0	42.5	**54.9**

SD/D – single deck, diesel power;

DD/D – double deck, diesel power;

DD/E – double deck, electric power.

11.106 Calculated daytime and night noise levels at a distance of 2 metres have been calculated from the proposed new bus turnaround location at Tunworth Crescent to the nearest residential properties. Table 11.23 provides the predicted noise levels at those nearest receptors, the excess above existing ambient noise level and contribution to the total noise level as a result of the Development:

Table 11.23: Tunworth Crescent bus turnaround predicted levels - Daytime

Receptor	Daytime Noise Level / $L_{Aeq,\ 16hr}$ dB				
	Predicted Noise Level	Existing Noise*	Excess	Total Noise**	Increase
Sherfield Gardens	47.4	55	-7.6	55.7	0.7
Highcliffe Drive	42.9	55	-12.1	55.3	0.3
Minstead Gardens	42.0	55	-13.0	55.2	0.2
Tunworth Crescent	48.2	55	-6.8	55.8	0.8

** Obtained at Sherfield Gardens (LT1) which was the closest long term measurement to proposed bus turnaround position.*

*** Predicted noise level plus existing*

Table 11.24: Tunworth Crescent bus turnaround predicted levels - Night

Receptor	Night Noise Level / $L_{Aeq,\ 8hr}$ dB				
	Predicted Noise Level	Existing Noise*	Excess	Total Noise**	Increase
Sherfield Gardens	43.2	51	-7.8	51.7	0.7
Highcliffe Drive	38.6	51	-12.4	51.2	0.2
Minstead Gardens	37.7	51	-13.3	51.2	0.2
Tunworth Crescent	43.9	51	-7.1	51.8	0.8

** Obtained at Sherfield Gardens (LT1) which was the closest long term measurement to proposed bus turnaround position.*

*** Predicted noise level plus existing*

11.107 The highest noise levels from the relocation of the bus turnaround area would understandably be at the nearest residential blocks at the entrance of Tunworth Crescent. Predicted noise levels at this location are 48.2 dB(A) $L_{Aeq,T}$ during the daytime and 43.9 dB(A) $L_{Aeq,T}$ at night; resulting in a total noise increase (existing + predicted) of 0.8 dB during both daytime and

night. It is likely that individual movements would be audible at nearest receptor however, the total level of increase for both daytime and night periods (maximum 0.8 dB) would be imperceptible. It should be noted that the assessment has been undertaken assuming a worst case scenario in terms of the total amount of bus movements per day and night (360 movements). Furthermore, existing glazing within those nearest properties along Tunworth Crescent would be sufficient to ensure the internal criteria within BS 8233 is achieved. The effect of such an increase would be negligible.

11.108 Should the lower assumed bus movements be taken into consideration from the current bus timetables (240 movements), the highest predicted noise level at Tunworth Crescent is 46.3 dB(A) during the daytime and 42.8 dB(A) at night. The increase of noise above existing ambient levels would be 0.6 dB(A) during daytime and night periods.

11.109 Maximum noise from the bus turnaround has also been calculated and assessed against the existing noise levels during daytime and night at Tunworth Crescent; existing noise has been obtained from the nearest long-term monitoring position at Sherfield Gardens (LT1). Predicted maximum noise levels at the nearest receptor from the proposed bus turnaround location would be up to 8.2 dB L_{Amax} lower than existing levels at Tunworth Crescent. It is likely that individual bus movements would be audible at receiver however, levels are of a magnitude which do not exceed those already experienced at the nearest receptor locations.

Site Suitability – Internal Noise Levels at Proposed Residential Properties

11.110 The suitability of the Development has taken into account both the measured noise levels during the baseline noise survey and the modelling exercise results. Illustrations of the graphics output from the noise modelling, with the Development in place are shown for daytime (07:00 – 23:00) and night (23:00 – 07:00) respectively in Appendices 11.3 and 11.4 at 4.5 and 16.5 metre receptor heights (first and fifth floor respectively).

11.111 Table 11.25 defines the worst-case noise level for each of the residential blocks. The table includes the level of mitigation required to achieve the design target guidance levels discussed in Section 11.33.

Table 11.25: Highest predicted Development residential façade levels

Block / Floor	Direction	Predicted Façade Noise Level / dB		Mitigation Required / Rw dB	
		$L_{Aeq,\ 16hr}$ Daytime	$L_{Aeq,\ 8hr}$ Night-time	$L_{Aeq,\ 16hr}$ Daytime	$L_{Aeq,\ 8hr}$ Night-time
Block A / Floor 4 - 6	North	64	58	29	28
Block B / Floor 3	North	68	62	33	32
Block C / Floor 2 - 3	North	68	63	33	33
Block D/E / GF – Floor 1	North	68	63	33	33
Block F / Ground Floor	North	68	63	33	33
Block G / Ground Floor	North	68	63	33	33
Block H / Ground Floor	South	67	63	32	33
Block I / Ground Floor	South	67	63	32	33
Block J / Ground Floor	South	68	63	33	33
Block K1 / Floor 5 - 8	West	61	57	26	27
Block K2 / Floor 5 - 6	North	66	62	31	32
Block K3 / Floor 4	North	71	67	36	37
Block M / Floor 2 - 3	North-East	73	69	38	39
Block N1-N2 / Floor 3 - 6	East	70	66	35	36
Block N3-N4 / Floor 2 - 4	North	72	68	37	38
Block O / Floor 3	North-East	73	69	38	39
Block Q1 / Floor 7	East	63	59	28	29
Block Q2 / Floor 1 - 4	East	71	67	36	37
Block Q3 / Floor 5 - 7	East	64	60	29	30

11.112 Calculated worse case facade noise levels during the daytime at Blocks M and O would be 73 dB(A) during the daytime and 69 dB(A) during the night. The insertion loss performance of a partially open window is between 10 – 15 dB(A); the building envelope would therefore be required to achieve a minimum attenuation value of 39 dB(A) at these facades in order to achieve the adopted internal noise criteria.

11.113 An additional night-time assessment has been prepared for the measured 10th highest maximum noise level (in line with the WHO guidance) to predict internal noise levels. Noise predictions are understandably higher than those provided in Table 11.25 however the predictions are not sufficient to increase the level of mitigation required to achieve the design target thresholds included in the previous table. The mitigation for each Development block should therefore be governed by the levels provided in Table 11.25.

Site Suitability – Residential Outdoor Balconies

11.114 Daytime noise levels at those areas proposed for outdoor space, specifically the balconies of each residential block have been calculated. The highest values would be experienced at

Blocks M and O in line with the predictions outlined in Table 11.25. Balcony areas within this block would be subject to 73 dB(A) during the daytime.

11.115 Under such circumstances, BS 8233 acknowledges that where the external guidelines are not achievable in all circumstances where development would be desirable, the convenience of having these areas should outweigh the potential high noise levels where such locations are positioned near to existing transport sources. Such an interpretation was sought and agreed with LBW prior to the assessment; predicted noise levels would therefore be acceptable and outweigh the possible removal of the proposed balcony areas.

Site Suitability – Eastwood Children's Centre and Nursery

11.116 BB93 provides guidance for indoor ambient noise levels for schools and associated space. The guidance has been used to inform the predicted noise levels and level of mitigation required for the proposed Eastwood Children's Centre and Nursery at Portswood Place. The results of the noise modelling at ground floor and first floor are provided below.

Table 11.26: Predicted façade levels – Eastwood Children's Centre and Nursery

Nursery / Administrative Space					
Floor	Facade	Use	Noise Level / $L_{Aeq,30mins}$ dB		
			Predicted Level	Noise Criteria*	Mitigation Required / R_w dB
Ground Floor	North	Learning/Play	63	35	28
Ground Floor	North	Administrative	63	40	23
1st Floor	North	Learning/Play	65	35	30
1st Floor	North	Administrative	65	40	25

** Upper limits for new builds intended for learning and administrative use*

11.117 Calculated worst case facade noise levels of the Eastwood Children's Centre and Nursery would be 65 dB(A) at the first floor northern facade. The building envelope would be required to reduce external to internal noise levels by up to 30 dB(A) assuming the space at the northern facade is used for learning purposes.

Site Suitability – Village Square

11.118 The Development includes the provision for a new village square to be relocated from its current position on the northern corner of Roehampton Lane and Danebury Avenue to the opposite side of Danebury Avenue. The proposed area covers a space from the proposed library building at Block A to Roehampton Lane; the suitability of this outdoor amenity space

has been assessed against current conditions within the existing area provided to the east of the existing library.

11.119 Existing noise levels at the current green space located to the east of the library were dominated by road traffic movements along Roehampton Lane; noise levels from this source have been used to calibrate the model and assess the levels at the proposed village square. Currently, users of the existing green space would be subject to free-field daytime noise levels of 66 dB(A).

11.120 Relocation of the village square to a new position in front of the proposed Block A, indicates that users within the centre of the proposed village square would be subject to a daytime noise level of 63 dB(A) free-field based on the increased relative distance from Roehampton Lane to the central position of the square.

11.121 Based on the Development proposals, users of the village square would experience a 3 dB(A) improvement over the existing levels in the current location, resulting in a negligible impact. Through discussions with the Environmental Services Officer at LBW, it was acknowledged that areas such as the village square would understandably be subject to such noise levels where the space is positioned next to transport noise sources and as a result, no specific criterion for the use of this space was recommended. In accordance with BS 8233, the inclusion of the proposed village square for residential amenity space would clearly outweigh its removal and coupled with the improvement in likely noise levels, no specific mitigation (in the form of barriers) is recommended.

Site Suitability – Public Library

11.122 BS 8233 provides guidance for internal library space within the range of 40 – 50 dB. The Development includes relocating of the library from its current position to the ground floor of Block A. Predictions at the facade of the proposed library are 65 dB(A) $L_{aeq,T}$; the building envelope would therefore need to be designed in order to reduce external to internal levels by 25 dB(A) in order to meet the most restrictive interpretation of the design criteria. It should be noted that although the facade of the library is further from Roehampton Lane, the value is marginally higher than the noise level predicted within the village square due to the addition of a 3 dB(A) facade correction.

Mitigation Measures

11.123 The following measures are required to mitigate the effects of the Development.

Construction Phase

11.124 Mitigation for construction noise would concentrate on those examples provided in BS 5228, whilst taking into account the Best Practicable Means (BPM) approach:

- Site inspections shall include checks to ensure that plant is being operated with any specified acoustic covers in place. Excessively noisy plant shall be removed from the Site for repair or maintenance. Quieter construction methods will be used, where required and where considered reasonable and feasible;
- Where generators are operated overnight, measures shall be taken to minimise noise levels at the nearest dwellings;
- Equipment will be switched off when not in use (including during breaks and down times of more than 30 minutes);
- Where possible, noisy plant should not be used simultaneously and/or close together to avoid cumulative noise impacts;
- Equipment and excavation work sites should be oriented, where possible, to reduce noise emissions to sensitive receivers;
- Normal working hours are expected to be:
    - Mon – Fri: 08:00 - 18:00;
    - Saturday: 08:00 – 13:00; and
    - No work on Sundays and Bank Holidays where noise will be audible at the site boundary.
- Sunday working shall be undertaken only in emergencies or with prior approval from LBW;
- Contact will be made with local authorities, where required to ensure that planned designated routes are set in place to minimise disturbance;
- Vehicle weight limits will be taken into consideration and permits obtained from transport authorities if warranted;
- Site speed limits will be set to minimise noise and vibration levels if required;
- As far as reasonably practicable, noise from reversing alarms will be managed through the following hierarchy of techniques:
    - The Site layout will be designed to limit and where reasonably practicable, avoid the need for the reversing of vehicles. Measures will be undertaken to ensure that drivers are familiar with the worksite layout.
    - Banksmen will be utilised to avoid the use of reversing alarms.
    - Reversing alarms incorporating one of more of the features listed below or any other comparable system will be used where reasonably practicable:
        - Highly directional sounders;
        - Use of broad band signals;
        - Self adjusting output sounders; and

- Flashing warning lights.
- Reversing alarms will be set to the minimum output noise level required for health and safety compliance.

- The contractor shall aim to be a proactive and considerate neighbour; any potentially affected residents shall be approached in advance of any potential disturbance and kept informed as works progress. A noise complaint handling procedure will be established and responded to quickly.

Operational Phase

Fixed Plant

11.125 Noise limits for the operation of fixed plant have been suggested as part of this planning submission. The recommended noise limits are based on existing background noise levels at those nearest receptors to the proposed Eastwood Children's Centre and include any possible rating penalties taking into account possible tonal elements to the installations. Fixed plant should be designed appropriately and should not exceed a noise level of 41 dB(A) (assuming daytime use only) to adhere to the requirements of LBW. Mitigation of any proposed fixed plant can be secured through an appropriately worded planning condition.

Residential Locations, Eastwood Children's Centre and Public Library

11.126 The insertion loss performance of a partially open window is widely accepted as being between 10 - 15 dB(A). The level of attenuation necessary for the indoor areas for those residential locations within Blocks M and O can be achieved using a high specification glazing products with a sound reduction index not less than 39 dB as a worse case.

11.127 Windows will need to remain closed (although not sealed) to achieve the required level of mitigation and, as such, alternative means of ventilation (potentially in the form of trickle vents or mechanical ventilation) will also be required, achieving a weighted sound reduction rating not less than 39 dB. The building fabric should also be designed and constructed to ensure that a 39 dB reduction is achieved. Care should be taken when choosing fixing methods for glazing to ensure the attenuation is achieved. Mitigation of the building façade, to ensure the appropriate design targets are complied with, can be secured through an appropriately worded planning condition.

11.128 Section 8.4.5.4 of BS8233 confirms the above and suggests that: *"The Building Regulations' supporting documents on ventilation… recommend that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation,*

trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice."

11.129 Similarly, the building envelope of the proposed Eastwood Children's Centre and Nursery would be required to reduce external to internal noise levels by 30 dB(A) assuming the space at the northern facade is used for learning purposes.

11.130 Based on the noise predictions at the ground floor of Block A, the building envelope of the northern facade of the proposed library building would need to reduce external to internal noise levels by 25 dB(A) in accordance with the guidance criteria within BS 8233. Mitigation of the building façade, to ensure the appropriate design targets are complied with, can be secured through an appropriately worded planning condition.

11.131 Within the energy strategy, completed by Energist UK Ltd (refer to Appendix 3.3), provision has been included for openable windows and Mechanical Ventilation and Heat Recovery (MVHR) as passive and active measures for the mitigation of noise and overheating. Noise modelling results provided by RSK to Energist UK Ltd, have been incorporated into the calculation procedures and subsequent energy strategy report which provides details of the BE LEAN design specification for the Development, which outlines the measures incorporated to manage the risk of overheating in new dwellings and includes; i) varying glazing transmittance g-values and, ii) MVHR. The Overheating Assessment is provided in Appendix 3.4.

Residual Effects

Construction Phase

11.132 A construction phase assessment has been undertaken for the Development, including impacts associated with construction noise and road traffic. Based on appropriate control measures and BPM, the proposed construction works have the potential to exceed the criteria within BS 5228 for short periods of time but not for periods of 1 month or more. The residual effects of construction noise are therefore considered to be minor adverse.

11.133 Based on existing road traffic flows along Roehampton Lane, the residual effect of construction road traffic is likely to be negligible.

Operational Phase

11.134 An assessment of the operational phase has been conducted, which includes the effects of

fixed plant noise, road traffic and suitability of the Site for the Development.

11.135 Noise limits for the operation of any proposed fixed plant as part of the Development have been suggested as part of this assessment. The recommended noise limits are based on existing background noise levels at those nearest receptors, LBW requirements and include any possible rating penalties taking into account possible tonal elements to the installations. Assuming future fixed plant would be designed accordingly, the residual effect of such installations would be negligible.

11.136 The effect of future road traffic noise levels including increased road traffic on the nearby network and relocation of the bus turnaround area at Tunworth Crescent have been assessed. Based on the 'without development' and 'with development' scenario in the 2030 opening year of Development for the local network and proposed bus movements using the turnaround area, the residual effects of the Development would be negligible.

11.137 Based on mitigation imbedded within the design, particularly through the use of high specification double glazed windows and supplementary ventilation systems, the criteria for internal noise levels of residential dwellings, proposed Eastwood Children's Centre and relocation of the library those proposed buildings would be met. The Development would therefore result in a negligible residual effect.

Cumulative Effects

11.138 The cumulative impact of the Development in terms of noise and vibration is restricted to the impact of changing road traffic levels. Road traffic noise levels provided by the appointed traffic consultant have included the Development plus further committed developments in the area and are not predicted to be significant; the assessment has been undertaken in accordance with the criteria outlined in DMRB. Those cumulative developments include:

- Digby Stuart and Southlands Colleges, Roehampton Lane, SW15 (ref. 2014/3330, approved 13/10/2014).

11.139 The cumulative effect of construction noise related impacts has been discounted due to the relative distance between the proposed Alton Estates and Digby Stuart/Southlands College developments, and application of control measures on each site through the incorporation of best practicable means approach to construction and likely noise criteria.

Summary

11.140 This section presents the findings of an assessment of the likely significant effects of noise and vibration at existing and future receptors surrounding the Site. The assessment follows nationally and locally recognised policies, standards and guidelines to determine the likely significance of any effects during the construction and operational phases, and the suitability of the Site for the Development.

11.141 A baseline noise survey has been undertaken during the day and night of 7th - 8th November 2017 in order to identify appropriate noise criteria and to compare with potential future noise levels as a result of the Development. The assessment has taken into account criteria within documents specific to certain aspects of noise (i.e BS 4142, BS 8233 and DMRB), to the magnitude of impact change from the baseline conditions and the effect of the Development.

11.142 A qualitative assessment of construction noise and vibration has been undertaken. Proposed noise and vibration criteria at nearest receptor have been provided, to the requirements of BS 5228 along with details of appropriate mitigation. Construction noise and vibration (including road traffic) can be suitably controlled through an appropriate CEMP and adherence to the Best Practicable Means (BPM) approach to working, being their impacts classed as negligible.

11.143 Operational traffic has been assessed for the opening year 2030. A comparison between the 'Do nothing' and 'Do something' scenario has concluded that predicted noise impacts due to changes in traffic levels are of a magnitude that no greater than 1 dB in the short term for the majority of the surrounding road network. Where traffic noise levels are predicted to exceed 1 dB(A), baseline noise measurements indicate that current ambient noise levels exceed the road traffic noise levels (calculated in isolation) and therefore any such increase would be imperceptible. Increases in noise level as a result of the Development proposals would therefore be negligible. Traffic data has included the provision for future developments and the operational effect of the committed developments in the surrounding area.

11.144 Criteria for fixed plant noise at nearest receptor locations have been discussed in order to adhere to the requirements of BS 4142: 2014 and to achieve a negligible magnitude of impact. The criteria are based on existing background noise levels obtained during the baseline monitoring.

11.145 The suitability of the Site for residential and teaching space has been assessed with reference to the indoor criteria in BS8233: 2014 and BB93. Predictions indicate that the Development façades would require attenuation over and above that provided by an open window, in order

to meet internal noise criteria. Suitable mitigation can be provided using high performance specification double glazing/ventilation products, the level of which is discussed further within this chapter.

11.146 The assessment indicates that there are no significant effects as a result of the Development during either the construction and/or operational phases.

11.147 Table 11.27 contains a summary of the likely significant effects of the Development.

Table 11.27: Table of Significance – Noise & Vibration

Potential Effect	**Nature of Effect** (Permanent/Temporary)	**Significance** (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	**Mitigation / Enhancement Measures**	**Geographical Importance***							**Residual Effects** (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Construction Noise	Temporary	Minor Adverse	Procedures within the CEMP, including: • operate within approved construction hours; • no plant/equipment to be operational at night; and • Equipment switched off when not in use. Further details provided in Section 11.123							*	Minor Adverse
Construction Traffic	Temporary	Negligible							*		Negligible
Construction Vibration	Temporary	Negligible								*	Negligible
Completed Development											
Fixed Plant Noise	Permanent	Negligible	Mechanical plant designed (in terms of noise source output) accordingly to the requirements of LBW							*	Negligible
Road Traffic Noise	Permanent	Negligible	None Required						*		Negligible
Relocation of Bus Turnaround	Permanent	Negligible								*	Negligible
Cumulative Effects											
Construction											
Construction Noise	Temporary	Minor Adverse	Procedures with the CEMP (as above)							*	Minor Adverse
Construction Traffic	Temporary	Negligible							*		Negligible
Operation											
Road Traffic Noise	Permanent	Negligible	None Required						*		Negligible

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

REFERENCES

[1] National Planning Policy Framework – Department for Communities and Local Government, 2012 (amended 2019).

[2] Noise Policy Statement for England (NPSE) - DEFRA, 2010.

[3] London Local Plan - https://www.london.gov.uk/what-we-do/planning/london-plan

[4] Wandsworth Local Plan - http://www.wandsworth.gov.uk/info/1004/planning_policy

[5] IEMA Guidelines for environmental noise assessment, 2014

[6] British Standard 7445-1:2003: Description and measurement of environmental noise – Part 1: Guide to quantities and procedures

[7] BS 5228-1: 2009+A1: 2014: Code of practice for noise and vibration control on construction and open site – Part 1: Noise;

[8] BS 5228-2: 2009+A1: 2014: Code of practice for noise and vibration control on construction and open site – Part 2: Vibration;

[9] International Standard: ISO 9613-2: 1996(E): Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation;

[10] British Standard 8233: 2014: Sound insulation and noise reduction in buildings – code of practice;

[11] Building Bulletin 93 - Acoustic Design of Schools – A Design Guide, 2015;

[12] World Health Organization (WHO) - Guidelines for Community Noise, 1999;

[13] ProPG: Planning & Noise - Professional Practice Guidance on Planning & Noise, 2017;

[14] British Standard 4142: 2014: Methods for rating and assessing industrial and commercial sound;

[15] Calculation of Road Traffic Noise. Department of Transport, Welsh Office HMSO.

[16] Design Manual for Roads and Bridges – Part 7 HD 213/11, 2011

Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 12 Biodiversity

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12. BIODIVERSITY

Introduction

12.1 This chapter of the ES assesses the likely significant effects of the Development on the environment in respect of biodiversity and ecology.

12.2 The purpose of this Ecological Impact Assessment (EcIA) is to:

- Provide an objective and transparent assessment of the ecological effects of the Development;
- Facilitate objective and transparent determination of the consequences of the project in terms of national, regional and local policies relevant to nature conservation and biodiversity; and
- Set out what steps will be taken to adhere to legal requirements relating to designated sites and legally protected or controlled species.

12.3 The chapter is supported by Appendices 12.1 to 12.7:

- Habitats Regulations Screening Assessment (12.1);
- Phase 1 Habitat Survey and Protected/Notable Species Habitat Assessment (including badger) (12.2);
- Preliminary Bat Roost Assessment (PBRA) and Emergence/Return to Roost Surveys (12.3);
- Bat activity surveys (12.4);
- Invertebrate Survey (12.5);
- Great crested newt (GCN) Habitat Suitability Index (HSI) and eDNA sampling (12.6); and
- Arboricultural Implications Assessment (12.7).

Policy Context

12.4 The following relevant policies and legislation were taken into account during the ecological assessment.

National Planning Policy Framework[i]

12.5 The National Planning Policy Framework (NPPF) revised in 2019 sets out the Government's planning policies for England and how these are expected to be applied. The NPPF contains the following statements which are of relevance (not an exhaustive list, but including those

of highest relevance):

- Section 15, paragraph 170 states that the planning system should contribute to and enhance the natural and local environment by: "minimising impacts on biodiversity and providing net gains in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;";
- Section 15, paragraph 174 states that planning applications should "promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity".
- Section 15, paragraph 174 states that - "To protect and enhance biodiversity and geodiversity, plans [local authorities] should: identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation"; and
- Section 15, paragraph 175 states that: "When determining planning applications, local planning authorities should apply the following principles: if significant harm resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused". It also states that: "planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of ancient or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss and a suitable compensation strategy exists".

Strategic Planning Policy

London Plan (2016)[ii]

12.6 The London Plan is the spatial strategy for Greater London, which is the principle overall strategic plan for London that sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20 – 25 years. The policies most relevant to ecological aspects include 7.19 which states that *'development proposals wherever possible, make a positive contribution to the protection, enhancement, creation and management of biodiversity'*.

Local Planning Policy

12.7 The Wandsworth Local Plan Core Strategy (Adopted March 2016)[iii] and Development Management Policies Document (Adopted March 2016)[iv] contain a number of relevant policies to this Site, with the principal ones summarised in Table 12.1.

Table 12.1: Summary of local planning policy

Document	Planning Policy	Purpose
Wandsworth Local Plan Core Strategy (Adopted March 2016)	PL 4 (Open space and the natural environment)	The council will protect and improve public and private open space and green infrastructure in the borough. The biodiversity value of the borough will be protected and enhanced. New development should avoid causing ecological damage and propose full mitigation and compensation measures for ecological impacts which do occur.
Development Management Polices Document (Adopted March 2016)	Policy DMO 4 Nature Conservation	Development which would cause harm to a Special Area of Conservation, Site of Special Scientific Interest, Local Nature Reserve, Site of Importance for Nature Conservation, other site with important bio-geodiversity value, or any protected species will not be permitted unless any damaging impacts can be prevented by appropriate mitigation measure or use of conditions. All development proposals should aim to provide gains for biodiversity.
Development Management Polices Document (Adopted March 2016)	Policy DMO 5 Trees	Permission for development which would result in damage to or loss of trees of amenity value will not be permitted unless it is the interests of good arboricultural practice or adequate replacement planting is proposed.

Legislative Context

12.8 The key applicable legislative framework is summarised as follows:

- The Conservation of Habitats and Species Regulations 2017 (as amended) ('the Habitat Regulations')[v];
- Wildlife and Countryside Act 1981, as amended (the "WCA")[vi];
- The Natural Environment and Rural Communities (NERC) Act 2006[vii];
- Section 41 of this Act sets out species and habitats of principal importance for the conservation of biodiversity in England (hereafter 'Species of Principal Importance' and 'Habitats of Principal Importance').
- The Countryside and Rights of Way Act 2000[viii];
- The Protection of Badgers Act 1992[ix];
- Wild Mammals (Protection) Act 1996[x]; and

- The Animal Welfare Act (2006)[xi].

Assessment Methodology

Overview

12.9 The approach to the Environmental Impact Assessment (EIA) and the methodologies applied are in accordance with the requirements of The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)[xii]. The collection of baseline data, evaluation of ecological significance and assessment of impacts follows the guidance provided by the Chartered Institute of Ecology and Environmental Management (CIEEM). This includes:

- Description of baseline conditions summarising the desk study and field survey data reported in the individual technical ecological reports (see Appendices 12.2 to 12.6);
- Identification of the Important Ecological Features;
- Assessment of nature conservation value/biodiversity importance of each Important Ecological Feature;
- Identification of activities that may have an impact on the valued ecological features describing their extent, magnitude, duration, reversibility, timing and frequency;
- Assessment of impacts: this section provides a description of all significant impacts for each valued feature during the construction and post-construction of the development;
- Determination of the significance of the residual effects on each ecological feature.
- Identifying cumulative effects; and
- Identifying opportunities for ecological enhancement.

Consultation

12.10 An EIA Scoping Opinion Request (refer to Appendix 2.1) was submitted to the London Borough Wandsworth (LBW) in September 2017 which detailed ecology surveys being undertaken. LBW provided a response on 11th October 2017, stating they were *'satisfied that the approach proposed is appropriate as long as the report is submitted to us prior to July – Oct 2018.'* Otherwise updated bat surveys will need to be undertaken and further survey work carried out.

12.11 Upon completion of ecology surveys in 2017, consultees were consulted on the survey results and the Development. The outcomes of this consultation are summarised in Table 12.2.

Table 12.2: Summary of consultation

Consultee	Recommendations
Natural England	Standing Advice was received for protected species in relation to the Development.
London Wildlife Trust	No response was received.
Royal Parks – Adam Curtis, Park Manager	Concerns highlighted: • Light spillage; and • Suitable and safe pedestrian and cycle access to Richmond Park; Further recommendations included: • Under section 106 or CIL funded projects, Richmond Park might offer potential opportunities to: o provide pedestrian gate and paths; o create new pond(s) to improved dispersal for great crested newts; o provide amphibian access under the park roads; o reduce the extent of tarmac and return to parkland; o increase root protection zones for veteran trees; o provide tree planting; and o provide community initiates, events and information.
Wimbledon Common Conservation Officer	No response was received.
Wandsworth Borough Council – Valerie Selby, Parks Development and Biodiversity Manager	To ensure PL4 and DM04 are implemented: • Mitigation hierarchy adhered to; • Biodiversity Net Gain, including measures to provide adequate, functional and connected habitat; and • Implementation of a Construction Environment Management Plan (CEMP).

Zone of Influence

12.12 The area of study[1] has focussed on the Site and the anticipated 'zone of influence' (ZOI) of the Development. The Development may have potential to affect ecological features outside the Site, and these are defined as the impacts arising within the ZOI for any particular feature.

12.13 The ZOI encompasses international nature conservation designations within 10km of the Site; other nature conservation designations within 2km; and local non-statutory nature conservation designations, and protected notable habitats and species within 2km of the Site boundary.

12.14 Definition of the scope of the assessment at the site level was based upon the Development design and CIEEM guidelines for defining ZOI. The ZOI for impacts upon habitats or species is defined by the ecological requirements of that feature and its place in ecosystem function rather than by setting generic defined geographic zones.

Desk Study

12.15 A desk study was undertaken in July 2017, with the following data sources referred to:

[1] The geography for which data is analysed in this report

- Records of legally protected and notable species within 2km of the Site provided by Greenspace Information for Greater London (GiGL);
- Information on International nature conservation designations within 10km of the Site boundary and statutory designated sites and priority habitats within a 2km radius of the Site available on online databases including Multi Agency Geographic Information for the Countryside (MAGIC) and the Joint Nature Conservation Committee (JNCC); and
- Records of non-statutory sites designated for nature conservation value within 2km of the Site provided by GiGL;
- Publicly available maps and aerial photography;
- AECOM (2015). Alton Estate Due Diligence Site Investigations: Ecological Appraisal. Wandsworth Council[xiii];
- Surrey Wildlife Trust (2015) Great Crested Newt Survey Report: Richmond Park and Bushy Park[xiv];
- Wimbledon and Putney Commons (2016) – Monitoring Report – Spring/Summer 2016[xxviii];
- A bat survey of Richmond Park May and July (2009). Frank Greenaway[xv]; and
- Information provided by the Richmond Park Manager, including location of badger setts and the Conservation and Engagement Officer at Wimbledon Common.

Site Surveys

12.16 Table 12.3 details ecological survey work undertaken to inform the assessment. Detailed methods are presented in Appendix 12.2-12.6. Surveys were undertaken by suitably qualified ecologists, based upon current industry best practice guidance for each specific habitat type and group.

Table 12.3: Summary of Ecological Surveys Undertaken in 2017 and 2018

Survey Type	Dates	Survey Methodology	Baseline Report Reference
Phase 1 Habitat Survey and Protected/Notable Species Habitat Assessment	8th August 2017 and 1st September 2017	Joint Nature Conservation Committee (JNCC) (2010). Handbook for Phase 1 habitat survey - a technique for environmental audit. JNCC, Peterborough[xvi] Chartered Institute of Ecology and Environmental Management (CIEEM) (2013, 2017). Guidelines for Preliminary Ecological Appraisal. CIEEM, Winchester.[xvii]	Appendix 12.2
Badger sett identification and field sign survey	1st September 2017	Harris, S., Cresswell, P. and Jefferies, D. (1989).	Appendix 12.2

Survey Type	Dates	Survey Methodology	Baseline Report Reference
		Surveying Badgers. Mammal Society.[xviii]	
Preliminary Bat Roost Assessment (PBRA)	8th August 2017 and 1st September 2017	Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.[xix]	Appendix 12.3
Bat emergence and re-entry surveys	12th September 21st September 2017 22nd September 2017 28th September 2017 22nd September 2017 28th September 2017 24th July 2018	Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.[xix]	Appendix 12.3
Bat activity surveys using walked transect and static/automated detector methods	**Statics** - 28th June – 3rd July 2017, 30th July 2017 – 4th August 2017, 21st September 2017 – 26th September 2017, 28th September – 3rd October 2017, 17th October 2017 – 22nd October 2017. **Transects** – 28th June 2017, 30th July 2017, 31st July 2017, 21st September 2017, 10th October 2017, 17th October 2017.	Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.[xix]	Appendix 12.4
Invertebrate Survey	23rd June 2017, 17th July 2017, 8th August 2017	Various methods. See Appendix 12.5 for details.	Appendix 12.5
Great crested newt (GCN) Habitat Suitability Index (HSI) and eDNA sampling	26th June 2017	ARG UK (2010)[xx], based on Oldham et al. (2000). Biggs *et al*., (2014)[xxi]	Appendix 12.6

Identification and Evaluation of Key Receptors

12.17 The key ecological receptors that will be subject to the predicted effects have been identified and valued from the baseline information determined from desk and field surveys.

12.18 CIEEM states that detailed assessment should address those ecological features which are both important and potentially affected by the project. Details of features that are widespread, unthreatened in the context of the Development, resilient to changes incurred and which will remain viable and sustainable do not require detailed assessment.

12.19 In the context of this assessment, ecological features are defined as any ecological designation, habitat or faunal species/group which has the potential to be affected by changes to the Site. This includes:

- Statutory and non-statutory designations (where these are considered close enough to the Site such that they may be affected by the Development);
- Habitats within or adjacent to the Site; and
- Faunal species/groups or assemblages using habitats within or adjacent to the Site.

12.20 Based on the ecological baseline assessment, any habitat types and faunal species/groups considered to be 'negligible' ecological value/importance were not considered likely to be significantly adversely affected by the Development and are not considered further in the assessment.

12.21 The first stage of evaluation was to take the desk study and baseline survey results and place them in the following contextual frames of reference:

- Geographical frame of reference (international, UK, national, regional, county, borough or local importance);
- Statutory designated sites;
- Species of biodiversity value or significance, based on the UK BAP, or listed in Section 41 of the NERC, which are considered to be of principal importance for the conservation of biodiversity in England, including legally protected or controlled species;
- Secondary or supporting value; and/or
- Social and economic value.

12.22 For the purposes of this assessment, sites, species populations, species assemblages and habitats were valued using the following geographical scale:

- International e.g. Special Areas of Conservation (SAC), Special Protection Area (SPA), or Ramsar site;
- National e.g. Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR);
- Regional (South East) e.g. best examples within the South East;
- County/Metropolitan (Greater London); e.g. Site of Metropolitan Importance (SMINC),
- District/Borough (Wandsworth) e.g. Site of Nature Conservation Importance (SBINC/SLINC); and
- Local (Alton Estate and within 2km) e.g. a good example of a common or widespread habitat in the local area.

12.23 The value of some features can be readily determined where they have been previously assigned a level of nature conservation value through statutory or non-statutory designation. The designated sites network fits well within the geographical hierarchy of evaluation. The

tiers of UK nature conservation sites have been followed to assist the valuing of Ecological Features. Therefore, Sites of international importance are SACs, SPAs and Ramsar sites. Sites of national importance for nature conservation are SSSIs.

12.24 It is recommended in the CIEEM guidelines that sites and habitats with no formal designation should be evaluated against the existing selection criteria for national, county and more local sites, taking account of the local context, potential value and secondary or supporting value (e.g. as a buffer for another habitat) where these criteria are not met. The conservation value and scarcity of habitats as expressed in the UK BAP and NERC lists can be used to help to assess the value of a habitat. The Advice Note – Process for selecting and confirming Sites of Importance for Nature Conservation (SINCs) in Greater London will be used in this assessment to help evaluate the importance of habitats on Site[xxii]. London BAP information and listings such as the Ancient Woodland Inventory or the Grassland Inventory can also help to assess importance.

12.25 Other features, however, require an evaluation based on professional judgement in the context of the Site and its locality. The valuation of populations of species populations, assemblages of species and habitats uses accepted criteria and tools to enable an evaluation of the importance of a species.

12.26 Some species have statutory protection through their inclusion in schedules in The WCA or annexes of The Habitats Regulations, while some are listed as priority species in the UK BAP (amended in 2007) and are therefore included in the list of species in Section 41 of the NERC. Such species have therefore been afforded a higher valuation.

12.27 Lists which do not provide statutory protection include the list of Birds of Conservation Concern (BoCC)[xxiii] and Red Data Books. These lists enable us to apply a further level of valuation as, for example, a Red List Species is afforded a higher valuation than Green list species in BoCC. There is a list of London BAP species and London species of conservation concern.

12.28 CIEEM recommend the following characteristics to identify the nature conservation value of species, or features that may support species, including the following:

- Rarity at an international, national, county or more local scale;
- Presence of endemic or locally distinct sub-populations;
- Size of population in the geographical context (e.g. notably large population);
- Species on the edge of their range;

- Species rich assemblages of plants and animals;
- Plant and animal communities considered to be typical of valued habitats; and
- Ecosystems, habitat diversity, connectivity, mosaics and associations which provide important habitat for any of the above species or assemblages.

12.29 Table 12.4 summarises the Ecological Feature Importance used by CIEEM for habitats and species which has been used in this assessment.

Table 12.4: Description of Geographical Scales of Ecological Importance for Habitats and Species

Geographic Importance/Value	Criteria
International **Very High**	**Habitats** An internationally designated site or candidate site (Special Protection Area (SPA), candidate SPA, Special Areas of Conservation (SAC), candidate SAC, Sites of Community Importance, Ramsar Site, Biogenetic/Biosphere Reserve, World Heritage Site) or an area that would meet the published selection criteria for designation. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole. **Species** A sustainable population of an internationally important species i.e. a UK Red Data Book species or species listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP) which is listed in Annex IV of the Habitats Directive, or as being of unfavourable conservation status in Europe, of uncertain conservation status or of global conservation concern in the UK BAP. Sites supporting a breeding population of such a species or supplying a critical element of their habitat requirements.
UK/National **High**	**Habitats** A nationally designated site, SSSI, NNR, Marine Nature Reserve or a discrete area, which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A sustainable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat which are essential to maintain the viability of a larger whole. A large area of a Habitat of Principle Importance, Ancient Woodland or Wood Pasture and Parkland HPI. **Species** Any regularly occurring/large population of a nationally important species (e.g. England Red Data Book). A large population of a species identified as a Species of Principal Importance. A species population which would qualify for SSSI designation.
Regional **Medium - High**	**Habitats** Areas of internationally or nationally important habitats which are degraded but are considered readily restored; Viable areas of key habitat identified in Local BAPs, or smaller areas of such habitat which are essential to maintain the viability of a larger whole; **Species** A regularly occurring, locally significant number of a nationally important species.
County/Metropolitan	**Habitats**

Geographic Importance/Value	Criteria
Medium	Sites recognised by local authorities, e.g. LWSs. County sites that the designating authority has determined meet the published ecological selection criteria for designation. A diverse and/or hedgerow network comprised of mostly Important Hedges. Degraded areas of HPI (excluding Wood Pasture and Parkland HPI and Ancient Woodland Lowland Mixed Deciduous Woodland HPI which is Ancient Woodland). **Species** Any regularly occurring, locally significant population of a SPI or a species listed in a county/district BAP (where available). A regularly occurring, locally significant population of a county/district important species. Sites supporting populations of internationally/nationally/regionally important species that are not threatened or rare in the region or county, and not integral to maintaining those populations. Sites/features scarce in the county or that appreciably enrich the county habitat resource.
District/Borough **Low-Medium**	**Habitats** Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds). Sites that retain other elements of semi-natural vegetation that, due to their size, quality or the wider distribution within the local area, are not considered for the above classifications. **Species** Populations/assemblages of species that appreciably enrich the biodiversity resource within the local context. Sites supporting populations of county/district important species that are not threatened or rare in the region or county, and are not integral to maintaining those populations.
Local/Site **Low**	**Habitats** Common and widespread habitat, not meeting any of the above criteria. Areas of heavily modified or managed vegetation of low species diversity or low value as habitat to species of nature conservation interest. **Species** Common and widespread species, not meeting any of the above criteria.

Characterising Ecological Impacts

12.30 Each ecological feature determined as 'important' will have potential impacts considered from construction and operation phase. Considering whether the impact is:

- Beneficial or adverse: Whether the effect of the impact would result in net loss or degradation of an Important Ecological Feature or whether it would enhance or improve it. Impacts are considered to be adverse if the construction or operations cause: a detrimental effect on a vulnerable ecological receptor; a potential reduction in the conservation status/ecological value of a habitat/species population; and/or, a site's

integrity[2] to become compromised. Impacts are considered to be beneficial if the construction or operational activities cause: a non-valued ecological receptor to become valued; the restoration of favourable conservation status for a habitat/species population; and/or, the restoration of a site's integrity where previously it has been undermined;

- Extent: The spatial scope of the effect. For example: the physical area affected; or, the geographical pattern of the effect;
- Magnitude: The size or intensity of the effect measured in relevant terms. For example: the number of individuals lost or gained; area of habitat lost or created; or, the degree of change to existing conditions such as noise or lighting levels. The magnitude of impacts is further discussed in Table 12.5;
- Duration: The length of time over which the effect occurs;
- Timing and Frequency: Consideration of the timing of events in relation to ecological change. Some effects may be of greater significance if they take place at certain times of year, such as during the breeding bird season. The extent to which an effect is repeated may also be of importance; and
- Reversibility: The extent to which effects are reversible, either spontaneously or through active mitigation.

12.31 Ecological receptors are usually sites, habitats, species assemblages or communities, or populations or groups of a species. Effects can be permanent or temporary, direct or indirect, and can be cumulative. These factors are brought together to assess the magnitude of the impact on particular Important Ecological Features and, wherever possible, the magnitude of the impact is quantified. Professional judgment is then used to assign the effects on the receptors to one of four classes of magnitude, defined in Table 12.5.

Table 12.5: Definition of Magnitude

Magnitude	Definition
Major/High	A permanent or long-term effect on the extent or size or integrity of a site; or conservation status of a habitat, species assemblage or community, population or group. If adverse, this is likely to threaten sustainability. However, if beneficial, this is likely to enhance conservation status.
Moderate/Medium	A permanent or long-term effect on the extent or size or integrity of a site; or the conservation status of a habitat, species assemblage or community, population or group. If adverse, this is unlikely to threaten sustainability. However, if beneficial, this is likely to be sustainable but is unlikely to enhance its conservation status.
Minor/Low	A long-term reversible effect on a site, habitat, species assemblage or community, population or group whose magnitude is detectable but will not threaten its integrity.

[2] The integrity of the designated sites is defined by the CIEEM as "the coherence of ecological structure and function, across a site's whole area, that enable it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified."

Magnitude	Definition
Negligible	A short-term reversible effect on the extent or size or integrity of a site, habitat, species assemblage or community, population or group that is within the normal range.

12.32 In the ecological assessment, potential impacts are initially characterised in the absence of any mitigation, except where this is integral to the design of the Development. Any additional mitigation or compensation proposed is identified and its likely effectiveness is assessed.

12.33 Within the assessment, an indication of the confidence with which predictions of potential impacts are made is also given. When predicting confidence, a four-point scale is normally employed. Within this scale the confidence levels are:

- Certain/Near-Certain: Probability estimated at 95 per cent chance or higher;
- Probable: Probability estimated at above 50 per cent, but below 95 per cent;
- Unlikely: Probability estimated above 5 per cent, but less than 50 per cent; and
- Extremely Unlikely: Probability estimated at less than 5 per cent.

Determining Ecologically Significant Effects

12.34 The procedure used for the assessment of likely significant effects from the Development focuses on the integrity or conservation status of each ecological receptor. The decision as to whether the integrity or conservation status of an ecological receptor likely to be affected is made using professional judgement based on an analysis of the predicted effects of the Development.

12.35 The significance of the predicted impacts on Important Ecological Features arising from the identified effects of Alton Estate, including mitigation measures, is assessed. From Table 12.5, the level of significance is assigned once the magnitude of the impact has been defined. Significance is assessed as being either: major, moderate, minor (adverse or beneficial) or negligible. The interpretations of these significances are given below.

- Major: Adverse impact on ecological integrity or conservation status at **regional, national or international level**. This level of significance represents a highly significant impact on an Important Ecological Feature and would warrant refusal of a planning proposal if significant mitigation is not provided.
- Moderate: Adverse impact on ecological integrity or conservation status at **district-borough or county-metropolitan level**. This level of significance represents a potentially significant impact that requires careful individual assessment. Such as impact could warrant planning refusal, but it may be of a scale that can be resolved by revised

design or appropriate mitigation.

- Minor: Adverse impact on ecological integrity or conservation status at site - **local level.** This level of significant is not normally of concern, though normal design care should be exercised to minimise impacts. Under normal EIA regulations, impacts of this level are considered to be 'Not Significant'. However ecological effects can be considered significant at a wide range of scales from international to local[xxiv].

Limitations and Assumptions

12.36 The evaluation and significant effects is based on the best available scientific evidence. If sufficient information is not available, further survey or additional research may be required. In cases of reasonable doubt, where it is not possible to value and ecological feature or robustly justify a conclusion of no significant effect, a precautionary approach has been adopted and a valuation of 'up to' a geographic level of importance has been assigned and a significant effect has been assumed where appropriate.

12.37 Limitations associated with field surveys are detailed in each baseline report (Appendices 12.2 to 12.6). The assessment is based on information gathered during 2017 and 2018, providing sufficient information from which to inform an ecological assessment and mitigation. Due to the length of the construction phasing and the mobility of species such as bats, repeat surveys have been recommended for all trees proposed for removal, and buildings scheduled for demolition/refurbishment, before starting on site to ensure any roosts are identified prior to any development commencing. These requirements are detailed in Paragraphs 12.142 to 12.144.

Habitats Regulations Assessment

12.38 Under the Habitats Regulations, an assessment is required where a plan or project, either alone or in combination with other plans or projects, is likely to give rise to significant effects upon a Natura 2000 site.

12.39 A Habitats Regulations Screening Assessment (HRSA) has been carried out to determine if significant effects to Richmond Park SAC or Wimbledon Common SAC would be caused by the Development. No likely significant effects were concluded and that therefore an Appropriate Assessment would not be required (Appendix 12.1).

Baseline Conditions

Designated Sites

Statutory Sites

12.40 The Site does not contain any statutory designations.

12.41 There are two Ramsar designations that fall within 10km of the Site boundary that are part of the South West London Waterbodies. The closest of these is located approximately 9.7km to the south-west of the Site and due to the distance and the lack of pathways to this receptor, these are not considered any further in this report.

12.42 There are three sites with statutory nature conservation status within 2km of the Site. A description of the sites is detailed in Table 12.6.

Table 12.6: Statutory Designated Sites

Site name	Designation	Size (ha)	Approximate distance and orientation from Site	Description
Richmond Park	SAC, SSSI, NNR	846.68	Adjacent to south-west	SAC designation for its population of stag beetle *Lucanus cervus* and SSSI designation includes extensive dry acid grassland.
Wimbledon Common	SAC, SSSI	348.31	0.75km to east	SAC designation for its habitat types of wet and dry heaths and for its population of stag beetle *Lucanus cervus*. SSSI designation includes acid grassland, mire and woodland.
Barnes Common	LNR	41.7	1.8km to north	Designated for its acid grassland, acid scrub, woodland and neutral grassland.

Non-Statutory Sites

12.43 There are twelve non-statutory nature conservation sites within 2km of the Site. A description of these sites is detailed in Table 12.7. There are three tiers of sites:

- Sites of Metropolitan Importance (SMINC);
- Sites of Borough Importance (Borough grade I and Borough grade II) (SBINC); and
- Sites of Local Importance (SLINC).

Table 12.7: Non-statutory Designated Sites

Site name	Designation	Size (ha)	Distance and orientation from the Site	Description
Richmond Park and associated areas	SMINC	1063.55	Adjacent	See Table 12.6
Roehampton University	SBINC (Grade I)	20.16	Adjacent to north	Acid and amenity grassland, ponds and a small area of woodland
Roehampton Golf Club	SBINC (Grade II)	34.16	Adjacent to north	Acid grassland, scattered trees and woodland
Wimbledon Common and Putney Heath	SMINC	448.2	0.75km to east	See Table 12.6
Beverley Brook in Wandsworth	SBINC (Grade I)	1.47	0.8km to north-west	A wildlife-rich brook with scrub and woodland
Beverley Brook in Kingston	SBINC (Grade II)	3.11	1.4km to south-west	A wildlife-rich brook with water-loving birds and invertebrates
Beverley Brook from Richmond Park to the River Thames	SBINC (Grade II)	3.86	1.4km to north-west	A variable stretch of river with plants that are scarce in London
Putney Vale Cemetery	SBINC (Grade II)	18.15	1.2km to south	Amenity and semi-improved grassland with scattered trees
Putney Park Lane and The Pleasance	SLINC	3.02	1.3km to north-east	Amenity and semi-improved neutral grassland, scattered trees and scrub
Bank of England Sports Club Grounds	SBINC (Grade II)	15.6	1.3km to north-east	Amenity and semi-improved neutral grassland, scattered trees and woodland
Richard Evans Memorial Playing Fields and Stag Lane	SBINC (Grade II)	15.78	1.5km to south-east	Recreation area, with some damp grassland
Barnes Common	SMINC	51.4	1.8km to north	See Table 12.6

Habitats

12.44 The Site does not contain any habitats of principal importance and there are no ancient woodland areas within the Site or within 2km that appear on the ancient woodland inventory.

12.45 The Site consists largely of buildings and hard-standing, amenity grassland and Parkland including scattered trees. A summary of the Phase 1 Habitat types recorded during the Preliminary Ecological Appraisal (PEA) (Appendix 12.2) is presented in Table 12.8. All habitats within the Site were common and widespread and considered to be of up to **Local** importance and as such are not considered further in this assessment.

Table 12.8: Summary of Habitats within the Site

Phase 1 Habitat Type	Area (ha)	% of Site Area	Description	Assigned Importance
Broadleaved Semi-natural Woodland	0.08	0.48	Ash *Fraxinus excelsior*, Pedunculate Oak *Quercus robur*, yew *Taxus*	Provides a source of food and shelter for invertebrates, small

Phase 1 Habitat Type	Area (ha)	% of Site Area	Description	Assigned Importance
			baccata, cherry laurel *Prunus laruocerasus* and snowberry sp. *Symphoricarpos* sp. present along the south-west boundary with Richmond Park Golf Course. Ground flora included bramble *Rubus fruticosus*, ivy *Hedera helix* and garlic mustard *Alliaria petiolata* and lords-and-ladies *Arum maculatum*. Small amount of dead wood present.	mammals and birds, as well as breeding habitat for birds. Non-native species present and small area. This habitat is very common in a local, county and national context. Notwithstanding the potential for this habitat to support protected species and/or species of conservation interest this habitat is considered to be of **District/Borough importance.**
Broadleaved plantation woodland	0.05	0.30	Birch sp. *Betula* sp.., with frequent *Sambucus nigra* and occasional dogwood *Cornus sanguinea*.	Provides a source of food and shelter for invertebrates, small mammals and birds, as well as breeding habitat for birds. Notwithstanding the potential for this habitat to support protected species and/or species of conservation interest this habitat is considered to be of **District/Borough importance.**
Scrub	0.05	0.30	Dense scrub with dominant bramble and frequent ivy.	Habitat for invertebrates, small mammals and birds. Notwithstanding the potential for this habitat to support protected species and/or species of conservation interest this habitat is considered to be of **Local importance.**
Parkland and broadleaved scattered trees	3.99	23.88	Conifers and broad-leaved trees present of various ages, although many trees are believed to have been planted in the 1950s. Species present include exotic species, horse chestnut *Aesculus hippocastanum*, sycamore *Acer pseudoplatanus*, Norway maple *Acer platanoides* and London plane *Platanus* x *acerifolia*.	Habitat for invertebrates, small mammals and birds, although intensively managed for recreation. Parks and urban green spaces are a London BAP priority habitat. Scattered trees are also subject to conservation objectives under the Wandsworth Borough Tree Strategy[xxv].

Phase 1 Habitat Type	Area (ha)	% of Site Area	Description	Assigned Importance
				Notwithstanding the potential for this habitat to support protected species and/or species of conservation interest this habitat is considered to be of **District/Borough importance.**
Semi-improved neutral grassland	0.10	0.60	Yorkshire fog *Holcus lanatus* was abundant, with perennial rye grass *Lolium perenne* occasionally occurring. Common ragwort *Senecio jacobaea*, ribwort plantain *Plantago lanceolata*, yarrow *Achillea millefolium*, field bindweed *Convolvulus arvensis*, cat's-ear *Hypochaeris radicata* and thyme-leaved speedwell *Veronica serpylifolia*.	Species-poor with low floristic diversity and small in extent. Notwithstanding the potential for this habitat to support protected species and/or species of conservation interest this habitat is considered to be of **Local importance.**
Amenity grassland	4.95	29.62	Numerous areas of amenity grassland across the Site. Dominated by perennial rye grass, annual meadow grass *Poa annua*, dandelion *Taraxacum* sp., daisy Bellis perennis, ribwort plantain and white clover *Trifolium repens*.	Very species-poor with very limited ecological value. **Negligible importance.**
Introduced shrub	0.05	0.30	Several small areas of introduced shrub on Site, species included Cotoneaster sp. cherry laurel, snowberry and Oregon grape *Mahonia aquifolium*.	Limited potential for invertebrates, small mammals and birds. Non-native species present. **Negligible importance.**
Buildings and hard-standing	7.44	44.52	Buildings largely consisted of residential tower blocks, which were built in the 1950s. There are numerous roads, footpaths, car parking and playground areas within the Site.	Built structures are a London BAP priority habitat. Limited potential for bat roosts or birds. Notwithstanding the potential for this habitat to support protected species and/or species of conservation interest this habitat is considered to be of **Negligible importance.**
TOTAL	16.71	100		

Flora

12.46 No notable plant species were recorded during the field survey.

Invasive Species

12.47 One Schedule 9[xxvi] species was confirmed (Japanese knotweed) at approximately TQ 21513 74024 to the west of Tumworth Crescent. A Schedule 9 cotoneaster species may be present. It is recommended that these plants are removed and disposed of correctly. The Horticultural Manager of the Estate was informed of the presence of Japanese knotweed and advised that other locations within the estate had previously been treated. As these are non-native plants, they are ecologically detrimental, so they have no assigned ecological value.

Amphibians

12.48 The great crested newt is protected under the Wildlife and Countryside Act 1981 (as amended), and under The Habitats and Species Regulations 2017 (as amended). It is illegal to deliberately capture, injure or kill a great crested newt, to intentionally or recklessly disturb great crested newts, or to deliberately take or destroy the eggs of great crested newts. It is also illegal to damage, destroy or intentionally or recklessly obstruct access to a breeding or resting place used by a great crested newt. All life stages of great crested newts are afforded the same level of protection.

12.49 Twelve records of GCN were provided from GiGL within 2km of the Site, with the nearest being 619m to the south west dating from 5 May 2010. The most recent record was located 630m south-west of the Site, recorded on 7 June 2012. Twenty-eight records of common toad *Bufo bufo* and 142 records of common frog *Rana temporaria* were provided within 2km, the most recent records for both these species was dated 2016.

12.50 No waterbodies were recorded on the Site. Eleven waterbodies within 500m of the Site boundary were identified and surveyed (Appendix 12.6).

12.51 A complete HSI assessment (included part of Appendix 12.6) could not be undertaken at four waterbodies (1, 2, 3, and 13) due to desiccation. Four waterbodies (8, 9, 10 and 11) were ornamental ponds and were considered unsuitable to support GCN. Waterbody 12 was identified as being 'poor' for habitat suitability for breeding GCN. Waterbodies 4 and 7 were identified as 'average' and were therefore considered to be potentially suitable to support GCN.

12.52 Waterbodies 1 and 2 were confirmed as supporting GCN populations in a previous study. Waterbodies 1 and 2 are to the south of the Site and located over 400m away. eDNA sampling was undertaken at three waterbodies, with waterbody 4 returned as negative, indicating that GCN were absent from the waterbody. Waterbodies 7 and 12 were returned as positive, indicating GCN were present. Waterbody 7 is 460m to the east and waterbody 12 is 225m to the north of the Site.

12.53 Due to no waterbodies being identified on Site, the lack of suitable terrestrial habitat, poor connectivity and significant barriers to dispersal, GCN and other amphibians are not anticipated to be directly or indirectly affected by the Development. The Site consists largely of buildings, hard standing, mixed parkland and amenity grassland, which is considered to be of sub-optimal terrestrial habitat for GCN. Roehampton Lane and Clarence Lane present significant barriers to dispersal for waterbodies 7 and 12.

12.54 Therefore, whilst the population of GCN within 500m is considered to be of up to County/Metropolitan importance, they are not considered further in this assessment based on the distance of the population from Site; the physical barriers to dispersal; and the lack of suitable habitats to support the species on Site.

Badger

12.55 Badgers and their setts are protected under the Protection of Badgers Act (1992). Licenses, either to exclude badgers from a sett or to close it if there will be direct impact from the Development are required from Natural England. Further to this, disturbance licences are likely to be required from Natural England if activities such as digging, vegetation clearance or use of machinery occurs close to a badger sett.

12.56 Disturbance under licence can normally only be undertaken between July and November inclusive (outside of the breeding season).

12.57 Nineteen records of badger were returned within 2km with the most recent dating from 2015.

12.58 A map provided from the Richmond Park - Royal Parks Officer[xxvii] of known setts from 1995-2005 shows the nearest known sett to be over 400m away from the estate boundary to the west. Widespread field signs were also confirmed from Wimbledon Common in 2016 (Wimbledon and Putney Commons, 2016)[xxviii].

12.59 No field signs for badger were found within the Site or within 30m of the boundary on the south-west side of the Site. Disused mammal burrows were identified at approximately TQ

21620 73910 and TQ 21679 73880, but these were considered likely to be fox.

12.60 The Site does not support any badger setts and is unlikely to form part of a commuting and foraging route for badgers. Badgers are therefore not considered further in this assessment.

Bats

12.61 It is illegal to deliberately capture, injure or kill a bat and to intentionally or recklessly disturb bats. It is also illegal to damage, destroy or intentionally or recklessly obstruct access to a breeding or resting place used by a bat. The legislation is contained with the Wildlife and Countryside Act 1981 (as amended) and the Habitats and Species Regulations 2017, (as amended).

12.62 Nine species of bat have been recorded within 2km of the Site. These records comprised common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, Daubenton's bat *Myotis daubentonii*, Nathusius' pipistrelle *Pipistrellus nathusii*, Natterer's bat *Myotis nattereri*, brown long-eared bat *Plecotus auritus*, Leisler's bat *Nyctalus leisleri* and serotine *Eptesicus serotinus*.

12.63 Beverley Brook at Robinhood Gate, which is situated to the south-west of the Site had been confirmed as an important place for bats to cross between Richmond Park and Wimbledon Common.[xxvii] Known bat roosts are located in Richmond Park to the west of the Site.

2017 Bat Activity Surveys

12.64 Bat activity walked transects and automated static detector surveys were carried out monthly from June – October 2017.

12.65 Four species of bats were recorded during the walked transects: common pipistrelle, soprano pipistrelle, noctule and Leisler. The static detectors additionally confirmed the presence of Nathusius' pipistrelle, a single pass of *Myotis* sp. and a single pass of unidentified *Nyctalus/Eptesicus* sp.

12.66 Low levels of bat activity were recorded during all activity surveys, with the exception of the July dusk transect, which registered higher levels of activity.

2017 Preliminary Bat Roost Assessment (PBRA) and emergence/return to roost surveys

12.67 External building inspections and ground level tree roost assessments were undertaken within

the Site in 2017. Seven buildings were categorised as having low potential, with other buildings considered as having negligible potential within the Site. The majority of buildings within the Site were of flat roof construction, which were considered to be of limited potential for roosting bats, with the addition of high disturbance and lighting.

12.68 Three trees were categorised as having moderate potential to support roosting bats, with trees in the footprint of Block M were grouped as having low potential. Other trees detailed in the bat survey report (Appendix 12.3) were considered to have low potential, with other trees on Site considered to have negligible potential. Trees in private gardens, and where access was not permitted, were not assessed, with some due for removal: T139, T140, T141, T142, T780, T781, G784, T785, G786, T787, G788, T503, T502, T500, T501 (refer to the Appendix 12.7).

12.69 Emergence and return to roost surveys were carried out on the buildings and trees in 2017 and 2018. No bats were recorded emerging from, or returning to any of the buildings or trees that were surveyed.

12.70 Four species of bats were recorded incidentally during the survey: noctule, common pipistrelle, soprano pipistrelle and Nathusius' pipistrelle.

12.71 Nil or low levels of incidental commuting or foraging activity were recorded at most survey locations, with higher levels of passes recorded at two locations.

12.72 Common and soprano pipistrelle are regarded as common and widespread and as such any development is expected to have limited impact on the overall conservation of bats in this area. There is parkland present on Site and a small area of woodland along the western boundary, which provide suitable foraging and commuting features. The location of the Site could provide potential commuting routes. There are extensive greenspaces present around the Site, with Richmond Park and Richmond Park Golf Club to the west, Roehampton Golf Club and Roehampton University grounds to the north, Wimbledon Common and Putney Heath to the south-east and east of the Site.

12.73 The Site has high light pollution in places and is primarily used by pipistrelle species of bats that are not light sensitive. Higher levels of activity were recorded along the western edge of the Site from stops 8-11 during the walked transects and around stops 17 and 18. During emergence surveys of buildings Binley House and 190 Roehampton Lane there were high and very high levels of activity recorded (Appendix 12.3), which can be attributed to foraging around street lighting.

12.74 No roosts were confirmed from Site, but a roost of a common species is considered to be of local importance. Nathusius' pipistrelle, noctule, Leisler's and Myotis sp. are considered to be rarer, with individuals of **up to County/Metropolitan** importance[xxix].

12.75 In summary, based on the survey findings, it has been identified that there is a low level of bat use on Site and as such it is considered that Alton Estate, given its position in the wider landscape, is of **District/Borough** importance for foraging and commuting bats. As such, potential impacts will need to be considered in context of legislation protecting these species in order to ensure legal compliance.

Birds

12.76 All birds are protected under the Wildlife and Countryside Act 1981 (as amended) from killing or disturbance during the breeding season (generally taken to be between March and September inclusive). Furthermore, bird species set out in Schedule 1 to the Wildlife and Countryside Act 1981 (as amended) (known as "Schedule 1 Species") have additional protection covering reckless disturbance.

12.77 A number of notable bird species were identified within the 2km study area which are protected under Schedule 1 of the Wildlife and Countryside Act 1981 and/or listed as A Species of Principal Importance on Section 41 of the Natural Environment and Rural Communities Act 2006 or the Birds of Conservation Concern (BoCC) red or amber lists. Notable species recorded, which may utilise the site include species such as house sparrow *Passer domesticus*, swift *Apus apus*, house martin *Delichon urbicum*, swallow *Hirundo rustica*, bullfinch *Pyrrhula pyrrhula*, barn owl *Tyto alba*, starling *Sturnus vulgaris* and turtle dove *Streptopelia turtur*.

12.78 No targeted bird surveys were undertaken. However, the trees and scrub present on Site have the potential to support common and widespread species of breeding bird. Most of the buildings within the intervention areas are flat roofed, providing limited potential for breeding birds. During the site visits in August 2017 species recorded included carrion crow *Corvus corone*, jackdaw *Coleus monedula* and ring-necked parakeet *Psittacula krameri*.

12.79 No BoCC Red or Amber list species were identified during site surveys. On the basis of this and limited nesting opportunities in and around the built environment, it was considered that the breeding bird assemblage of the Site is of **Local** importance.

Invertebrates

12.80 The desk study provided a number of records for red listed, notable, rare and UK BAP Priority

species. These included stag beetle *Lucanus cervus*, small heath *Coenonympha pamphilus*, white-letter hairstreak *Satyrium w-album* and white admiral *Limenitis camilla*.

12.81 A list of 81 invertebrate species was recorded, which was considered to be poor given the size of the Site and the suitable weather conditions during the surveys. Stag beetles were not identified on Site and habitat suitability was considered poor for this species.

12.82 The following unusual and scarce insects were recorded on Site during the survey:

- *Agrilus laticornis*, a local jewel beetle;
- *Athous campyloides*, a nationally scarce click beetle;
- *Lasius brunneus*, the nationally scarce brown tree ant;
- *Orsillus depressus*, a ground bug on garden cypress trees;
- *Rhinusa collina*, a nationally scarce weevil on garden toadflax;
- *Rhyparochromus vulgaris*, a ground bug recently arrived in the UK;
- *Taeniapion urticarium*, a scarce weevil on stinging nettles; and
- *Urocerus gigas*, the greater horntail wasp, a sawfly that breeds in conifer timber.

12.83 The few unusual species were recorded in isolated corners of the Site, and are species capable of rapid colonization, or of short-lived and ephemeral brownfield-type habitats.

12.84 It is considered highly unlikely that any of the scarce species recorded in the Site and surrounding area will be breeding within the Site boundary. Many of the species have been recorded from nearby Richmond Park and Wimbledon Common (to the south and south-west of the Site), comprising large semi-natural sites with long-standing wildlife management.

12.85 The Site has very low invertebrate biodiversity potential and it was found to be intensively managed. However scarce species were recorded and as such, the invertebrate assemblages is considered to be of **District/Borough** importance.

Other mammals

12.86 There were 79 records of hedgehog within 2km, with the nearest and most recent being 113m to the south-west of the Site in 2004. The habitats present on Site were considered to offer negligible to very low potential to support hedgehogs, with the exception of the area of woodland along the boundary to the south-west of the Site.

12.87 It is possible that hedgehogs could be present on the Site on account of local records, although there is limited suitable habitat to support the species given the intensive

management of open space areas and the dominance of the built environment. Therefore, hedgehogs are likely absent from the Site and not considered further in this assessment.

Reptiles

12.88 The Wildlife and Countryside Act 1981 (as amended) protects grass snakes (*Natrix natrix*), slow worms, adders (*Vipera berus*) and common lizards (*Zootoca vivipara*) making it an offence to deliberately or intentionally kill, injure, sell or trade these species. Other UK reptile species namely smooth snakes (*Coronella austriaca*) and sand lizards (*Lacerta agilis*) have additional protection under the Wildlife and Countryside Act 1981, and the Habitat and Species Regulations 2017 (as amended).

12.89 No records of reptile species exist for the Site; however, four species of reptile were recorded within 2km. The closest record of slow-worm was located 809m north of the Site and was dated from 1999. The most recent record was from 2016, which was recorded 1.8km north-west of the Site. The closest and most recent record of grass snake was recorded 1.5km to the north-west of the Site in 2005. Three closest record of common lizard was recorded in 2004 and located 1km north of the Site. A record of adder dating from 1999 also exists within 2km at an undisclosed location. A reptile survey from Wimbledon Common in 2016 confirmed common lizard (Wimbledon and Putney Commons, 2016).

12.90 Based on the urban built environment present within the Site and the managed condition of the open space areas, reptile species are considered likely absent from the Site.

Summary

12.91 The ecological receptors are summarised in Table 12.9 based on the baseline identification and evaluation. Where a site affords several overlapping designations, the highest value has been assigned and will be assessed as a single component, taking into account the reasons for each designation.

Table 12.9: Summary of Ecological Receptors

Ecological Receptor	Geographical Scale of Importance (Value)	Important Ecological Feature
Richmond Park SAC, SSSI, NNR, SMINC	International	✓
Wimbledon Common SAC, SSSI, SMINC	International	✓
Barnes Common LNR, SMINC	County/Metropolitan	✓
Eight SBINC	District/Borough	✓
Putney Park Lane and The Pleasance SLINC	District/Borough	✓
Habitats	District/Borough	✓
Amphibians	Likely absent/negligible	×

Ecological Receptor	Geographical Scale of Importance (Value)	Important Ecological Feature
Badger	Likely absent/negligible	×
Bats – Potential Roosts	up to County/Metropolitan	✓
Bats – Foraging and Commuting	District/Borough	✓
Birds	Local	✓
Invertebrates	District/Borough	✓
Other Mammals	Likely absent/negligible	×
Reptiles	Likely absent/negligible	×

Future Baseline

12.92 Significant changes in the baseline conditions between the present time and the proposed commencement of construction of the Development are considered unlikely due to the current urban and public realm management regime of open space areas. It is considered that the key baseline conditions within the Site are likely to remain similar between now and the Development. Subsequent colonisation of potential features by protected species, such as bats, is considered in this assessment.

Likely Significant Effects

Demolition and Construction

12.93 The likely significant demolition and construction effects identified are:

- Land-take (habitat loss);
- Disturbance (visual, noise, lighting);
- Pollution (air quality, dust generation, deposition, run-off); and
- Construction site hazards (direct killing/injury).

Richmond Park SAC, SSSI, NNR, SMINC and Wimbledon Common SAC, SSSI, SMINC

12.94 Habitat Regulations Assessment is a requirement of the European Council Directive 92/43/EEC 'The Habitats Directive' (as transposed into UK legislation by The Conservation of Habitats and Species Regulations 2017). A Habitat Regulations Screening Assessment (HRSA) (Appendix 12.1) was undertaken to identify likely impacts of the Development upon areas of nature conservation importance designated/classified under the Directive and screens whether the impacts are likely to be significant.

12.95 Richmond Park SAC and Wimbledon Common SAC were included in the HRSA through the consideration of their qualifying features and vulnerabilities in relation to the activities of the Development.

12.96 The HRSA concluded that there will be no likely significant effects whether alone or 'in combination' on the qualifying features of Richmond Park SAC or Wimbledon Common SAC. This was due to the following criteria being met:

- That the area of Annex 1 habitats (or composite features) will not be reduced;
- That there will be no changes to the composition of the habitats for which the site was designated (e.g. reduction in species structure, abundance or diversity that comprises the habitat over time);
- That there will be no direct effect on the population of species for which this site was designated or classified;
- That there will be no indirect effects on the population of species for which the site was designated or classified due to loss or degradation of their habitat (quantity and/or quality); and
- There will be no interruption or degradation of the physical, chemical or biological processes that support habitats and species for which the site was designated or classified.

12.97 No further assessment, by way of an Appropriate Assessment (Stage 2 of the HRA) was considered necessary. Therefore, no adverse significant effects on Richmond Park SAC, SSSI, NNR, SMINC and Wimbledon Common SAC, SSSI, SMINC are anticipated and effects resulting from the Development are considered negligible.

Barnes Common LNR, SMINC and Sites of Importance for Nature Conservation (SBINCs and SLINC)

12.98 Construction of the Development will not result in any direct habitat loss Barnes Common LNR or any non-statutory designated site.

12.99 Barnes Common LNR is situated 1.8km to the north of the Site. The closest non-statutory designated sites are Roehampton University SBINC (Grade I) and Roehampton Golf Club SBINC (Grade II), which are located adjacent to the Site and are designated for acid and amenity grassland, ponds woodland and scattered trees. These SBINCs are located north of Downshire Field, which is not proposed for development. Clarence Lane Highcliffe Drive and Sheffield Gardens, together with the landscaped and the built environment, separates the SBINCs from the Site, with the closest areas of Development situated c.170m south at Portswood Place and Block Q.

12.100 In accordance with conclusions drawn for the Natura 2000 sites with regard to air quality, hydrology and other indirect pollution effects, it is considered that degradation to the SBINCs and the habitats they contain is not anticipated. Based on the distance of these receptors

from the demolition and construction activities, the effect on the surrounding SBINCs and SLINC is therefore assessed as negligible.

Habitats

12.101 Construction of the Development would result in the loss of approximately 0.2ha of parkland habitat and approximately 200No. scattered trees (not including eight groups of immature species/saplings accounting for 178 individual specimens) (Refer to Appendix 12.7) to facilitate the works (both refurbishment works and habitat enhancement works). Typical species within this habitat across the Site include exotic species, horse chestnut *Aesculus hippocastanum*, sycamore *Acer pseudoplatanus*, lime species *Tilia* sp., Norway maple *Acer platanoides* and London plane *Platanus x acerifolia,* which presents limited conservation and supporting value for faunal species as they represent mostly planted semi-mature trees within the urban environment.

12.102 Nineteen trees are proposed for removal within Downshire Fields and public realm areas west of Portswood Place. Tree removal in these areas are proposed to provide ecological and landscape enhancements of parkland habitats. Approximately eighteen trees and a group of eleven trees (box elder, Norway maple, sycamore and ash) will be removed to facilitate the development of Block Q, whilst approximately 135No. trees within the urban realm environment will be removed as part of works to facilitate Blocks A, B, C, D, E, F, G, H, I, J, K, N and O.

12.103 Construction of Block M of the Development would result in the loss of 'parkland' comprising approximately 28No. trees, which is a managed area of public realm surrounded by development and adjacent to Roehampton Lane. This represents approximately 5% of the total (3.99ha) area of Parkland and Broad-leaved scattered trees within the Site. The permanent loss of this area is unlikely to affect the conservation status of this habitat given its abundance on the Site. The scattered trees within the 'parkland' habitat do not qualify as a Habitat of Principal Importance, do not contain ancient or veteran trees, is not grazed and does not contain decaying wood or other microhabitats capable of supporting a wide range of species. The permanent loss of 200No. scattered trees represents a 24% reduction in the total number of scattered trees on site (808No.). Loss of this habitat would result in an overall reduction in scattered trees across the Site and represents a moderate adverse effect on the conservation status of this scattered trees/parkland significant at the District/Borough level.

Bats

12.104 Construction of the Development and enhancement works will result in the loss of

approximately 200 No. trees which were assessed as having negligible to low potential to support roosting bats. A number of trees requiring removal were not assessed due to access (T139, T140, T141, T142, T780, T781, G784, T785, G786, T787, G788, T503, T502, T500, T501 (Refer to Appendix 12.7). No roosts were confirmed following emergence and re-entry surveys undertaken for the building. The trees surveyed that are proposed for removal were considered to be of sufficient size and age to contain potential roost features (PRFs); however, none were seen from the ground or features present exhibited very limited (low) roosting potential. If a roost was found to be present within the trees considered to be of low potential for bats, it is likely to be a place where individual bats are sheltering based on the size of the PRFs observed (a day/night/feeding/transitional roost). Given the known population in the area comprises mostly pipistrelle species and as bats are highly mobile, it is acknowledged that there is a small chance that they could start using the buildings or trees as roosts in the future. However, based on the 15No. trees not assessed, a precautionary assessment has been considered. In the absence of mitigation, the loss of roost, dependent on the species, is considered to represent a moderate adverse effect on the conservation status of the bat species, that would be significant at up to the County/Metropolitan level.

12.105 Disturbance principally associated with artificial lighting but also construction noise and vibration, may impact commuting and foraging bats in and around the Site and its surrounding habitat. All bat activity surveys registered low levels of activity, apart from the July dusk and dawn transects, which registered higher levels of activity. There is parkland present on the Site and a small area of woodland along the western boundary, which provide suitable foraging and commuting features. The location of the Site could provide potential commuting routes. There are extensive greenspaces present around the Site, with Richmond Park and Richmond Park Golf Club to the west, Roehampton Golf Club and Roehampton University grounds to the north, Wimbledon Common and Putney Heath to the south-east and east. The Site has high light pollution in places and is primarily used by pipistrelle species of bats that are not light sensitive. Higher levels of activity were recorded along the western edge of the Site. During emergence surveys of Binley House and 190 Roehampton Lane there were high and very high levels of activity recorded, which was attributed to foraging around street lighting. Such impacts during construction would be temporary and reversible, although the longer the disturbance continues the greater the magnitude of the impact on bats could be. In the absence of mitigation, construction disturbance on commuting and foraging bats is likely to result in a minor adverse effect at the local level.

Birds

12.106 Construction may result in the loss of nesting and foraging habitat of common bird species, as well as possible disturbance and incidental mortality in the absence of appropriate

mitigation. No targeted bird surveys were undertaken. However, the trees and scrub present on the Site have the potential to support common and widespread species of breeding bird. Most of the buildings within the intervention areas are flat roofed, providing limited potential for breeding birds. The development will result in the permanent loss of scattered trees during construction. However, there are large amounts of alternative habitat present within the Site, such as Downshire Field, and particularly the wider local area. It is unlikely that the loss of the scattered trees would significantly affect the conservation status of any of the bird species recorded. As such, the unmitigated impact would result in the permanent loss of a comparatively small number of scattered trees suitable for nesting birds. In the absence of mitigation, the permanent loss of suitable nesting bird habitat is considered to have a minor adverse effect on common bird species at the local level.

12.107 The incidental mortality and disturbance of birds will be avoided through the appropriate methodology and design of the clearance, demolition and construction programme. The methodologies and programme will take into account the bird breeding season to ensure that disturbance to nesting birds is minimised and that the incidental mortality to animals does not occur. This is considered to be a design measure rather than mitigation measure as it is taken into consideration on all projects. The implementation of well-considered project planning will help avoid all incidental mortality, which will subsequently be of negligible magnitude. Disturbance through an increase in light, noise, vibration and movement are, however, envisaged. Given the existing baseline of urban, residential and recreational disturbances associated with the established estate and infrastructure in the immediate area, such impacts are likely to only adversely affect breeding birds within the immediate vicinity of the construction works, or species that migrate in and are not accustomed to the existing baseline disturbances. Without considering most bird's ability to habituate to disturbance, these minor adverse effects are envisaged to be temporary and at a local level. This is not considered to be a significant effect due to the alternative nesting sites within the wider area and the planned timing of the site clearance works to avoid any direct effects.

Invertebrates

12.108 A single rotten tree stump, which was surrounded by a small area of bramble, was recorded to the southeast of Block A on the Site. A Nationally Scarce ant *Lasius brunneus* was also recorded in this location. No evidence of stag beetle breeding on the Site was found so the removal of potential suitable breeding habitat does not present an effect on the species. A Nationally Scarce beetle *Athous campyloides* and a Nationally Scarce weevil *Rhinusa collina* was recorded immediately east of Minstead gardens within habitats associated with the grounds of Roehampton Ecumenical Church, overgrown gardens and rough brownfield habitats around a small car park.

12.109 It is highly unlikely that any of the scarce species recorded on the Site and surrounding area will be dependent on habitats within the Site boundary. Many of these species have been recorded from nearby Richmond Park and Wimbledon Common (to the south and south-west of the Site), comprising large semi-natural sites with long-standing wildlife management. Many of these species are, like the stag beetle, associated with dead and decaying timber, fallen logs, tree stumps and dead standing tree trunks, all in various stages of fungal decay and rot. Refurbishment at Minstead Gardens will not affect habitats associated with *Athous campyloides* and *Rhinusa collina;* and the construction of Block A will not remove the line of trees on which *Lasius brunneus* was recorded. As such, development and refurbishment in these areas are likely to have a negligible effect on the conservation status of invertebrate assemblages.

Operational Phase

Operation

12.110 The Development will lead to an increase in an estimated 2,625 new local house occupants, and will potentially lead to following effects:

- Increase in recreational disturbance (excessive trampling, compaction and erosion of soil, disturbance and fouling by dogs and incidental fires);
- Increase in urbanisation (e.g. lighting, noise, domestic pets and predation, fly tipping);
- Changes in hydrology; and
- Increase in air pollution.

Richmond Park SAC, SSSI, NNR, SMINC and Wimbledon Common SAC, SSSI, SMINC

12.111 The Development will lead to an increase in an estimated 2,625 new local house occupants, and will potentially lead to an increase in the potential visitor numbers, disturbances and pollution threats upon Richmond Park and Wimbledon Common.

12.112 The areas of heath on Wimbledon Common could be vulnerable to recreational pressures. From the SSSI Unit maps, the areas of heath are situated to the north and south of Wimbledon Common. The 2013 SSSI condition assessment for Unit 1 states that measures are needed to bring the unit into a favourable condition including increasing the amount of bare ground and gaps and reducing scrub cover. The SSSI condition assessment for Unit 9 states that the rough areas did not seem to be suffering from significant over management/high footfall and that inappropriate cutting had in the past been implemented.

12.113 The extent of the heath is increasing due to a programme of tree and scrub removal, although it fails to meet key targets for quality. However, the condition assessment also concludes that there are no indications of significant damaging impacts to the heathland arising from non-native species, drainage, trampling, burning or disturbance. The grassland areas appear to be the main areas for recreation use, rather than the heathland, which do not represent any SAC features. The extent of historic scrub encroachment suggests that a lack of physical disturbance and trampling (which would help limit encroachment) from both people and grazing animals, is more of a concern rather than excessive footfall. It is therefore concluded that a general increase in recreational pressure is not likely to impact the areas of heath on Wimbledon Common SAC and the effect of the Development is considered negligible.

12.114 It should be noted that access to Richmond Park SAC and Wimbledon Common SAC is encouraged and resources are available to ensure recreational use is managed appropriately. Research indicates that few people are willing to walk for more than five or ten minutes to their local natural open space.[xxx] This translates into a distance of around 500 metres, suggesting that Wimbledon Common SAC (located approximately 750m east of the Site) would be at less potential risk to suffer from recreational pressure.

12.115 The Development has considerable open space which will be retained and enhanced as part of the regeneration works. There is parkland present within Alton Estate and a pedestrian and cycle loop are planned, which could significantly reduce the likelihood of residents of the Development seeking other areas for recreation.

12.116 The Site is already urban and built up and the Development focuses largely on regeneration, retaining a similar footprint to the existing Alton Estate. The provision and retention and enhancement of greenspace will help to alleviate urbanisation impacts, and with no reduction to the baseline extent of local greenspace (Downshire Field), urbanisation effects are considered negligible.

12.117 Based on the current design and as concluded in ES Chapter 10: Air Quality and ES Chapter 11: Noise and Vibration, it is concluded that there will negligible pollution effects from the operation of the Development on the SACs.

12.118 The Habitat Regulations Screening Assessment (Appendix 12.1) for the Development considered post-construction phases and concluded that no likely significant effects would occur during the 'operation' of Development.

Sites of Importance for Nature Conservation (SBINCs and SLINC)

12.119 There are not anticipated to be any adverse effects on other designated sites as a result of the operational phase of the Development. There may be a slight increase in the number of people visiting nearby SBINCs and SLINC, although this is unlikely to be at a volume which would appreciably affect habitats and species within them. The assessment for the SACs accounted for habitats considered to be more sensitive to disturbance and pollution than those recorded within these non-statutory sites, and were not considered to be subject to rises above relevant critical thresholds. Therefore, if the habitats and species within the more sensitive statutory designated sites were not exceeded, it can be assumed that non-statutory sites will not be affected and the effect on non-statutory sites from the operation of the Development is considered to be negligible.

Habitats

12.120 There is potential for increased human activity on the Site to result in increased pressure on retained and existing habitats, including woodland, grassland and parkland areas. Collectively, these habitats were considered to be of up to District/Borough value, however common within the wider geographical area. Habitats present within the Site are designed for recreation and currently undergo intensive management for such purposes. Increased anthropogenic pressure during operation of the Development in these locations is likely to result in a minor adverse effect at the local level.

Bats

12.121 Unmitigated artificial lighting during operation of the Development is anticipated to have an adverse impact on foraging and commuting bats within the Site. Light spill into unlit areas and green open space (southern boundary of Blocks B to G), north, west and south of Portswood Place and a Block Q of the Development may disturb foraging and commuting bats using the green open spaces and corridors on those aspects. This impact would be permanent for the duration of operation, yet reversible. Due to existing urban lighting and the species assemblages using the Site, an increase in light is not considered sufficiently significant to result in an effect on feeding efficacy or cause a significant barrier or diversion away from feeding grounds. Light spillage on to unlit areas, if left unmitigated, would cause minor adverse fragmentation and disturbance effects on foraging and commuting bats at the local level.

Birds

12.122 The operational impacts envisaged on foraging and nesting bird species are associated with disturbance from increased human and vehicle activity and predation from domesticated animals. Increases in the number of pedestrian and vehicular movements, as well as the number of household pets, all have the potential to disturb nesting birds. The birds likely to be breeding on the Site predominantly comprise passerines, corvids and pigeon species, all species known to tolerate low continuous levels of disturbance.

12.123 Unmitigated, such effects will be negligible, as the majority of habitat within the Site that provides suitable foraging and nesting habitat for birds (Downshire Fields) will be retained. The provision of additional habitats, such as biodiverse roofs and nest boxes, will provide suitable and safe nesting opportunities for common bird species using the Site.

Invertebrates

12.124 The Site is dominated by the built environment (buildings, tarmac, paving and other hardstanding) and municipal close-mown grassland. Large trees throughout the Site are mostly alien ornamental species. The biodiversity of such habitats is inevitably low and considered to be of negligible importance for invertebrate species with very few native trees recorded. Nevertheless, nationally scarce species were recorded and the most likely threat for invertebrate species during operation of the Development is not from increased human activity and domestic pet predation, but from inappropriate habitat management. If left unmitigated, there is potential for intensive management to damage and destroy the habitats that support scarce invertebrate species. These include scrub, woodland, meadow, rough grassland and brownfield habitats. Unsympathetic management that is currently undertaken for the Site would result in a minor adverse effect on the conservation status of invertebrate assemblages at a significant at the District/Borough level.

Mitigation Measures

12.125 Ecological mitigation measures that are required are often complementary to those needed to reduce or offset impacts on other aspects of the environment. For example, mitigation of landscape and visual impacts can often be combined with ecological measures.

12.126 Within the context of the Ecological Impact Assessment, the mitigation hierarchy is followed to prevent or reduce adverse impacts. The mitigation hierarch broadly follows:

- **Avoidance/Prevention Measures**
  These are measures taken to avoid or prevent adverse impacts, and can include: scheme layout; or, timing of site works.
- **Minimisation/Reduction Measures**
  These are measures taken to reduce adverse impacts and can include: retaining walls; and, pollution interceptors.
- **Rehabilitation/Restoration Measures**
  These measures are taken to improve degraded or removed ecosystems following exposure to impacts that cannot be completely avoided or minimised.
- **Compensation/Offsetting Measures**
  These are measures taken to offset significant residual adverse impacts and are for those measures that cannot be entirely avoided or mitigated to the point that they become insignificant.
- **Enhancement Measures**
  It is important that development is sustainable and that projects produce a net gain for biodiversity and nature conservation. National policy promotes the inclusion of measures to enhance biodiversity within development proposals. Enhancement of biodiversity should be an objective of all projects. Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, though they can be complementary.

12.127 In this section, mitigation measures are proposed for all significant ecological impacts on the habitats and species identified in the preceding sections of this chapter. General mitigation measures include best practice methods and general principles that can be applied to the Development as a whole, and are relevant to all habitats and species.

Construction Phase

General Mitigation

12.128 There are a range of environmental measures that will be implemented to reduce the risk of adverse impacts upon the surrounding environment:

- Implementation of a Construction Environmental Management Plan (CEMP);
- Adherence to all relevant Environmental Permits, Best Practice Guidance / Regulations, British Standards, and monitoring in respect of air quality, noise and vibration, water resources and protection of ecological and landscape features;
- Implementation of industry standard methods and procedures to ensure air quality

impacts are minimised throughout all phases of the project; and
- Implementation of a Sustainable Urban Drainage System (SuDs).

12.129 The CEMP will specify control measures for construction and will be developed by the Principal Contractor and agreed with the LBW prior to development commencing on the Site. The CEMP should include considerations such as:

- Dust suppression and dampening down during demolition and construction activities, to include haul routes;
- Noise and vibration suppression;
- Air quality controls – e.g. switch off engines, avoid excessive revving;
- Pollution prevention measures;
- Transport, storage and disposal of hazardous waste and oils;
- Low-level and directional lighting close to ecological features;
- Covering excavations to avoid mammal entrapment; and
- Tree protection.

12.130 Japanese knotweed has been identified within the Site boundary. An invasive species management plan will be produced prior to construction.

Habitats

Mitigation

12.131 The arboricultural report (Appendix 12.7) is in line with current British Standard 'Trees in relation to design, demolition and construction'. Tree protection zones will be established around retained trees and a protection area fenced off. The protected area will be regarded as sacrosanct. Once installed, barriers and ground protection will not be removed or altered without prior recommendation by the project arboriculturist and, where necessary, approval from the local planning authority. The arboricultural report (Appendix 12.7) also identifies any Root Protection Zones and demarcation requirements.

12.132 The design of the Development focuses on regeneration and redevelopment of the urban built up areas avoiding further land take within the public open space areas and green estate, thus avoiding encroachment and urbanisation of Downshire Field. Approximately 982 trees will be planted as part of the Development.

12.133 A mix of native tree species, including large, single stem trees, such as birches and maples will be planted in pocket green spaces, courtyards, the Village Square, commercial, primary,

secondary and tertiary streets will be provided. An approximate tree replacement ratio of 4.6:1 will be provided.

12.134 The tree planting strategy aims to provide and connect wildlife corridors across the Site linking the 'Parkland' Quarter (Downshire Fields) with the 'Urban' Quarter as well as providing wider green connections between Richmond Park, Putney Heath and Barnes Common and The River Thames. Trees will be retained where possible as part of the Development. The number and location of trees to be retained is identified within the Arboricultural Survey (Appendix 12.7). The arboricultural report prescribes targeted protection measures required to ensure suitable construction practices in proximity to retained trees.

12.135 The planting phase will be undertaken between October and March; the optimum period is before January when the soil has retained warmth and moisture in accordance with British Standards. Species and planting specifications are outlined in the Landscape Tree Strategy Plan (Dwg. 9028-L-Z-M-100-94-0102) but will incorporate both native and ornamental species.

Enhancement

12.136 As part of the Development, significant habitat creation and enhancement is proposed for Downshire Fields. In addition to the reduction of tree density on Downshire Fields, this will be complimented by the conversion of cultivated/amenity grassland areas to wild flower meadow creation. Approximately 4.48ha of wildflower meadow will be created and managed within Downshire Fields and surrounding amenity grassland areas. Large blocks of planting will run adjacent to the parkland path network with pockets of semi natural vegetation and path junctions.

12.137 The species to be included within the wildflower seed mix will be suitable for the soil substrate and conditions on-site. As such, the wildflower seed mix will aim to replicate the MG5 Cynosurus cristatus – Centaurea nigra grassland NVC community and where possible will include:

- Cat's ear *Hypochoeris radicata*
- Common bent *Agrostis capillaris*
- Common bird's-foot trefoil *Lotus corniculatus*
- Common knapweed *Centaurea nigra*
- Cowslip *Primula veris*
- Crested dog's tail *Cynosurus cristatus*
- Meadow vetchling *Lathyrus pratensis*
- Narrow-leaved bird's-foot trefoil *Lotus glaber*

- Oxeye daisy *Leucanthemum vulgare*
- Red fescue *Festuca rubra*
- Red clover *Trifolium pratense*
- Selfheal *Prunella vulgaris*
- St. John's Wort *Hypericum perforatum*
- Sweet vernal-grass *Anthoxanthum odoratum*
- Yellow rattle *Rhinanthus minor*

12.138 Yellow rattle detailed within species to include in the wildflower mix is of particular importance as the plant tends to restrict grass growth, thereby allowing other less-competitive species to thrive.

12.139 Creation of semi-improved grassland where soil pH is 5.5 or lower will employ a different seed mix to reflect the acidic conditions. It is likely that the resulting semi-improved acid grassland will support a sward broadly referable to a semi-improved variant of the lowland acid grassland NVC types U1: Festuca ovina- Agrostis capillaris- Rumex acetosella grassland or possibly U4 Festuca rubra – Agrostis capillaris – Gallium saxatile grassland. These NVC types are reflected in the choice of species for the seed mix which may include the following:

- Autumn hawkbit
- Barren strawberry *Potentilla sterilis*
- Betony *Stachys officinalis*
- Cat's-ear *Hypochoeris radicata*
- Common bird's-foot trefoil *Lotus corniculatus*
- Common dog-violet *Viola riviniana*
- Common knapweed *Centaurea nigra*
- Devil's bit scabious *Succusa pratensis*
- Harebell *Campanula rotundifolia*
- Heath bedstraw *Galium saxatile*
- Mouse-ear hawkweed *Hieracium pilosella*
- Pignut *Conopodium majus*
- Ribwort plantain *Plantago lanceolata*
- Selfheal *Prunella vulgaris*
- Sheep`s sorrel *Rumex acetosella*
- Slender St John's wort *Hypericum pulchrum*
- Tormentil *Potentilla erecta*
- Tufted vetch *Vicia cracca*
- Wavy hair-grass *Deschampsia flexuosa*
- Yarrow *Achillea millefolium*
- Yellow rattle *Rhinanthus minor*

12.140 Lowland meadow areas will be mowed to approximately 10 cm above ground level in June / July. It will then be cut again in September / October to emulate the traditional meadow management technique of aftermath grazing. The grassland will then be left unmown until the following summer cut. The precise timing of cutting will vary according to weather conditions (e.g. in a wet, cool year cutting may be earlier and in a hot, dry year it may be later). Included in the management prescription will be the flexibility to increase the cutting frequency, for example, additional aftermath cutting may be required. All arisings are to be collected and removed from the Site and appropriate safeguards should be in place to preserve and maintain a low nutrient soil status and profile.

12.141 Biodiverse roofs (approximately 1.9ha) will be incorporated onto Portswood Place, Blocks A-K and Blocks N, M, O and Q. A mixture of substrates will be used, leaving areas to self-seed and / or planted. Nectar-rich and London BAP species such as London rocket *Sysimbrium irio* and tower mustard *Arabis glabra*, will be used if seed is available from local populations.

Bats

Mitigation

12.142 For trees with low potential to support bat roosts (trees scheduled for removal at Block M of the Development), a preliminary ground level roost assessment of the trees should be undertaken by a qualified ecologist/bat worker such that a detailed inspection of the exterior of the tree can be undertaken to identify PRFs. If the trees remain of low potential to support roosting bats, no further surveys are required, however an arborist should be alerted to the possibility of bats being present and the need for vigilance during pruning/felling activities should be adopted. An ecologist will advise on any precautionary measures such as soft-felling, where appropriate. If PRFs indicate that the tree is of moderate or high potential to support bat roosts, further presence/absence surveys may be required.

12.143 Buildings with bat potential that are to be demolished and trees that are to be removed as part of the Development should be re-surveyed, due to the length of the construction programme, mobility of bat species and potential licensing requirements. All trees proposed for removal and buildings scheduled for demolition/refurbishment will be subject to repeat Preliminary Roost Assessments (and emergence/re-entry surveys where necessary) a season (May to September) before starting on site to ensure any roosts are identified prior to any development commencing. Should a roost be identified within any of the surveyed trees or buildings, a European Protected Species Licence will be obtained to legally exclude the roost prior to disturbance. Due to the nature of the construction programme, the following bat surveys will be undertaken for buildings and trees affected in each of the following work areas

as shown in Table 12.10.

Table 12.10: Bat Survey Requirements

Development	Preliminary Bat Roost Assessment	Emergence/Re-entry Survey
Blocks O, A and M	April 2019	May-Sep 2019 as required
Blocks N, Q and K	April 2021	May-Sep 2019 as required
Blocks B, C, D/E, F, G, H, I and J	April 2025	May-Sep 2025 as required

12.144 Night working between dusk and dawn will be avoided. In the unlikely event of night working, with lighting required, lighting will be kept at low-level, pointing away from tree-lines and fitted with back guards to prevent light spill into bat foraging habitat.

12.145 To mitigate for the time delay between temporary loss of potential roost sites following the vegetation clearance and the establishment of the new tree planting, a minimum of 18 bat boxes will be installed during the initial phase of the Development. The bat boxes will be installed along suitable areas of retained parkland areas. Boxes will be obtained from a suitable supplier and be Schwegler boxes made from woodcrete. This material has increased durability compared to wooden boxes, therefore reducing the need for future maintenance.

12.146 New bat roosting opportunities will be created on site. Eighteen bat boxes will be provided on six existing suitable trees within the red line boundary as indicated in the Design and Access Statement submitted as part of the planning application.

12.147 Bat boxes will be erected in clusters of three and positioned facing S, SW and SE aspects in a sheltered location. Positioning the boxes in this way will provide variation in micro-habitat temperatures as required by bats whilst roosting. This measure will therefore increase the likelihood of the boxes being used. Bird boxes will be located in proximity to bat boxes to ensure that bat boxes are not prioritised for use by birds.

12.148 On trees, boxes (2 No. Schwegler Bat Box 2F and 1 No. 2FN) can be positioned between 3m and 5m above ground level as this will provide a suitable range of temperature regimes.

12.149 Headless or domed nails should be used to attach the box to the tree. Correct mounting instructions will usually be supplied with the bat box. Where appropriate, a strap can be used

for mounting. The positioning of bat boxes should be undertaken under the supervision of a suitably qualified ecologist.

Birds

Mitigation

12.150 Any removal of vegetation that may contain nests is to be carried out outside of the nesting season (March to August). If this is not possible, an ecologist would be required to make an inspection of any breeding bird habitat prior to vegetation clearance. Buildings should also be inspected prior to demolition. Should nesting birds be found, the area would be cordoned off with at least a 5m buffer (depending on species) and work would not be able to resume with the cordoned off area, until an ecologist has confirmed the young have fledged.

12.151 Twenty bird nesting boxes will be erected on retained trees throughout the Site. This would mitigate for the temporary loss of trees and scrub, which provide potentially suitable features for nesting birds. A mixture of woodcrete bird boxes (e.g. Schwegler Nest Box 1B, 2M, 2HW, 2H and 1N) will be provided with varying entrance hole sizes (26mm and 32mm).

12.152 Nest boxes will be fixed to trees within the site as shown in the Design and Access Statement. Bird boxes should be placed so that they are afforded reasonable shelter from the adverse weather conditions such as wind, rain and intense sunlight. They should be mounted facing a south-easterly to northerly aspect as well as various boxes facing west to offer alternative nesting conditions. Most boxes should be mounted with at least a 4 m space below to ensure safety from predators.

Operational Phase

Habitats

Mitigation

12.153 A Management Plan should be produced and implemented to ensure the landscape planting and strategy is delivered and successfully fulfils conservation objectives for the Development. It will be the key mechanism for delivery of mitigation and enhancement measures prescribed within the ES for the operational phase of the Development. The Management Plan should focus on key habitats and species contained within the Site to ensure habitats reach their target condition.

Bats

Mitigation

12.154 Operational lighting will utilise low lux options. Lighting will be directed to where it is needed and light spillage avoided, specifically ensuring unlit boundaries, such as the southern edge of the Alton Estate and Downshire Field, are maintained. This will be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvres and shields to direct the light to the intended area only.

Invertebrates

Mitigation

12.155 Appropriate meadow management in line with the proposed landscape planting and habitat enhancement works will be implemented to ensure potential impacts to invertebrate species are minimised and that the operational management activities of the Development comply with the legal obligations required. This will include sympathetic mowing techniques, appropriate frequency and adequate safeguarding of rare and scarce species of invertebrate (Paragraph 12.141). This would seek to incorporate a less intensive regime, maintaining rough margins and uncut connected borders.

Enhancement

12.156 Log piles and biodiverse roofs have been incorporated into the landscape design of the Development. Specific stag beetle 'loggeries' will be provided in areas which remain undisturbed. Loggeries should be created using timbers buried vertically. Where stag beetle loggeries are provided, these areas should remain undisturbed. In order to avoid additional disturbance created by new residents, dog walking and littering, such designated areas should have interpretation boards or be fenced. These provisions will be of benefit to terrestrial invertebrates, in part to maintain the conservation status of stag beetles known to be in the wider area, but also to ensure provisions are made for the Red Data Book species recorded on the Site.

Residual Effects

Construction Phase

Habitats

12.157 In the short term, whilst landscaping matures, the loss of scattered trees across the Site represents a residual moderate adverse effect on the conservation status of habitat and is considered significant at the District/Borough level.

12.158 Provided the CEMP and impact avoidance measures in relation to habitats as detailed are adhered to, significant degradation to retained habitats during construction is unlikely.

12.159 In the medium to long-term, the loss of the trees during construction will be ameliorated through the provision of the landscaping planting and habitat creation; however, the benefits to biodiversity from the landscaping plan, will not be realised in the construction phase.

Bats

12.160 With the inclusion of bat boxes, this will ensure there is no reduction of roosting opportunities during construction. Following published guidance on mitigating the effects of artificial lighting, there will be a residual negligible effect on bats during construction of the Development.

Birds

12.161 Any removal or disturbance of habitats suitable to support nesting birds will be seasonally restricted; or safeguards will be put in place to ensure impacts are avoided on nesting birds during construction and therefore avoids any breaches of the legislation. With the inclusion of bird boxes prior to tree removal, building demolition or vegetation clearance, this will ensure there is no reduction of nesting opportunities during construction. This is likely to result in a residual negligible effect on nesting birds during construction of the Development.

Operational Phase

Habitats

12.162 On completion of the Development, habitats will have been created as part of the landscaping plan of both intrinsic value (including the provision of 4.4ha of wildflower meadow habitat,

and planting of 982 trees) and of supporting value to wildlife (including provision of habitat features to benefit invertebrates, birds and bats). As these habitats mature under management, they will provide habitat and a foraging resource for species in the long term. The landscaping plan will create a net gain in the number of trees on site and the creation of 1.6ha of biodiverse roofs and 6.7ha of other soft landscaped habitats which are likely to mature, under appropriate management, to a good condition targeted for wildlife. Considering the above gain in the extent and quality of the habitats, a minor beneficial residual effect on the conservation status of habitats present on the Site is anticipated.

Bats

12.163 As the habitats within the landscaping strategy are allowed to mature (including the net gain of in the number of trees and wildflower meadow creation) and the habitats features (such as bat boxes) are operational, foraging and sheltering habitat will be created for bats. It is not anticipated that the Development will significantly increase light pollution within the unlit areas as sensitive lighting will be incorporated throughout the Development.

12.164 The net gain in scattered trees and wildflower meadow habitat on the Site (of particular value to bats) and the provision of bat boxes, is likely to result in a minor beneficial residual effect for bats.

Invertebrates

12.165 As the habitats within the landscape plan mature under appropriate management and the habitat features (such as loggeries and other hibernacula) supporting species, foraging and sheltering habitat will be created for invertebrates (including stag beetle).

12.166 Assuming the landscaping plan and mitigation measures detailed above are successful, the benefits inherent in the landscaping plan will be accrued and the operational residual effect on invertebrates is therefore assessed as minor beneficial.

Cumulative Effects

12.167 The potential for cumulative effects upon habitats and species at the Site and within 2km of the Site, have been assessed to determine whether impacts upon them may be exacerbated as a result of the combined effects of other neighbouring developments. New housing and the associated increase in population, has led to the following schemes being considered for cumulative effects:

- Downshire House Roehampton Lane SW15 (ref. 2013/1857, dated 07/08/2013) for the erection of three buildings between three and five-storeys high, comprising 204 student bedrooms plus wardens flat. Works to include restoration of the lower lawn and landscaping with removal of 26 trees (including tree and hedge groups, 13 of which are covered by a preservation order) and planting of 19 trees. Formation and alterations to boundary treatment and pedestrian access from Roehampton Lane with alterations to car parking. (An application for listed building consent has also been submitted ref. 2013/1916).

12.168 If construction activities are undertaken simultaneously for the Development and the identified application, there is potential for an elevated degree of noise, vibration, and dust / emissions within the vicinity of the construction sites. This could exacerbate degradation to adjacent habitats. However, assuming standard best practice working methods are adhered to, adverse effects to habitats and species are not anticipated.

12.169 During operation, developments are likely to have beneficial effects on biodiversity, as measures to enhance biodiversity have been designed into these developments. In summary, assuming best practice working methods and the enhancement measures designed into the cumulative scheme are enacted; the cumulative scheme is not anticipated to exacerbate construction or operational effects arising from the Development.

Summary

12.170 Table 12.11 contains a summary of the likely significant effects of the Development.

Table 12.11: Table of Significance – Biodiversity

Potential Effect	Nature of Effect (Permanent/Temporary)	Significance (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	Mitigation / Enhancement Measures	Geographical Importance*							Residual Effects (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Richmond Park SAC, SSSI, NNR, SMINC and Wimbledon Common SAC, SSSI, SMINC	N/A	Negligible	N/A	*							No effect
Barnes Common LNR, SMINC and Sites of Importance for Nature Conservation (SBINCs and SLINC) and	N/A	Negligible	N/A						*		No effect
Habitats	Permanent	Moderate adverse	Regeneration avoids Downshire Fields; Habitat Creation and Enhancement of Public Realm and Open Space areas; adherence with CEMP.						*		Moderate adverse
Bats - Roosting	Permanent	Moderate adverse	Buildings with bat potential that are to be demolished and trees that are to be removed as part of the Development should be re-surveyed and appropriate mitigation/licensing to be implemented as required. A minimum of 18 bat boxes will be installed during the initial phase of the Development.					*			Negligible
Bats- Commuting and Foraging	Temporary	Minor adverse	Night working to be avoided. Construction lighting will be kept at low-level, pointing away from tree-lines and fitted with back guards to prevent light spill into bat foraging habitat.							*	Negligible

Birds – Incidental mortality	Permanent	Negligible	Removal of vegetation that may contain nests is to be carried out outside of the nesting season. Any removal of vegetation that may contain nests is to be carried out outside of the nesting season.							*	Negligible
Birds – Disturbance	Temporary	Minor adverse	Provision of suitable nesting habitats (20No. bird boxes) prior to clearance and demolition away from construction areas.							*	Negligible
Invertebrates	N/A	Negligible	N/A Log piles have been incorporated into the landscape design. Specific stag beetle 'loggeries' will be provided in areas which remain undisturbed. Loggeries should be created using timbers buried vertically.						*		No effect
Operation											
Richmond Park SAC, SSSI, NNR and Wimbledon Common SAC, SSSI	N/A	Negligible	N/A	*							No effect
Barnes Common LNR, SMINC and Sites of Importance for Nature Conservation (SBINCs and SLINC)	N/A	Negligible	N/A						*		No effect
Habitats	Permanent	Moderate adverse	Maturation and establishment of planting and landscape plan. Implementation of a Management Plan to ensure the landscape planting and strategy is delivered and successfully fulfils conservation objectives for the Site.						*		Minor beneficial
Bats- Commuting and Foraging	Permanent	Minor adverse	Sensitive lighting plans.							*	Minor beneficial
Birds	N/A	Negligible	N/A							*	No effect

Invertebrates	Permanent	Minor adverse	Implementation of meadow management in line with the proposed landscape planting and habitat enhancement works to ensure potential impacts to invertebrate species are minimised. Log piles have been incorporated into the landscape design. Specific stag beetle 'loggeries' will be provided in areas which remain undisturbed.						*		Minor beneficial
Cumulative Effects											
Ecology	N/A	Negligible	As designed								No effect

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 13 Daylight, Sunlight, Overshadowing and Light Pollution

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BARTON WILLMORE

13. DAYLIGHT, SUNLIGHT, OVERSHADOWING and LIGHT POLLUTION

Introduction

13.1 This chapter of the Environmental Statement (ES) is an assessment of the likely significant effects of the Development on the environment with respect to daylight, sunlight, overshadowing and light pollution.

13.2 The assessment considers these main issues:

- The effect of the Development on daylight and sunlight availability at adjacent existing residential properties;
- The effect of the Development on levels of sunlight within amenity areas and public open space surrounding the Site (overshadowing); and
- The effect of light pollution from the commercial elements of the Development on existing and proposed residential receptors in close proximity to the Site.

13.3 The chapter describes the methods used to assess the potential impacts and likely effects, the baseline conditions currently existing at the Site with its surroundings, the potential daylight, sunlight, overshadowing and light pollution impacts following introduction of the Development, (including commentary on mitigation measures integral to the Development), and the likely significance of the residual effects from the construction and operation of the Development.

13.4 The assessment has been undertaken in accordance with the relevant policy documents, the Building Research Establishment Guidance, 2011[i], British Standard 8206 Part 2: Code of Practice for Daylighting, 2008.

13.5 Some minor alterations have been made to the Development from when it was tested in November 2018 however these are not considered to be material. Figure 13.1 shows an overlay of the updated massing onto the massing that has been tested (in November 2018) and provides an appreciation that the changes are very marginal. Therefore, it is considered that these alterations do not justify a re-run of the technical analyses as the differences would be insignificant and not modify the conclusions on the Development. The results presented within this ES chapter are therefore still considered to be fully representative of the Development, despite the marginal alteration described.

Legislation and Policy Context

13.6 The following section of this ES chapter provides a review of relevant legislation, guidance and national, regional and local planning policy requirements in terms of daylight, sunlight, overshadowing and light pollution.

National Legislation

Clean Neighbourhoods and Environment Act, Section 102 (2005)

13.7 Section 79 of the Environmental Protection Act, 1990 as amended by the Clean Neighbourhoods and Environment Act, 2005[ii], states the following with regards to light pollution:

> *"Artificial light emitted from premises so as to be prejudicial to health and nuisance constitutes a 'Statutory Nuisance' and it shall be the duty of every local authority to cause its area to be inspected from time to time to detect any statutory nuisances which ought to be dealt with under section 80 [or sections 80 and 80A) and, where a complaint of a statutory nuisance is made to it by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint".*

National Planning Policy

National Planning Policy Framework, 2019

13.8 In February 2019 the Government published the new NPPF[iii]. The NPPF states:

> *"local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site."*

Planning Practice Guidance 2018

13.9 There is no reference to daylight, sunlight, overshadowing and light pollution within the 2018 draft Planning Practice Guidance.

Planning Practice Guidance 2014

13.10 Launched in 2014 and updated periodically, paragraph 026 of the PPG[iv] states that

> *"account should be taken of local climatic conditions, including daylight and sunlight".*

Regional Policy

London Plan, 2016

13.11 The key policies from the adopted London Plan[v] of relevance to this assessment are as follows:

- Policy '7.6 - Architecture' which states that *"…buildings and structures should…not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and micro-climate."*; and
- Policy '7.7 - Location and Design of Tall Buildings' which notes that large buildings should not adversely affect their surroundings in terms of overshadowing and solar reflected glare: *"Location and design of tall buildings should not affect their surroundings adversely in terms of microclimate, wind turbulence, overshadowing, noise, reflected glare, aviation, navigation and telecommunication interference."*

Draft London Plan, 2017

13.12 The Mayor of London published a new draft London Plan[vi] in November 2017, which will be examined during 2018 for final publication in 2019. Whilst the draft London Plan has very limited weight, it is capable of being a material consideration in the determination of planning applications.

13.13 The key policies from the draft London Plan of relevance to this assessment are as follows:

- Policy 'D4 - Housing Quality and Standards' which states that, *"The design of development should provide sufficient daylight and sunlight to new housing that is appropriate for its context, whilst avoiding overheating, minimising overshadowing and maximising the usability of outside amenity space."*; and
- Policy 'D8 - Tall Buildings' which states that "*Wind, daylight, sunlight penetration and temperature conditions around the building(s) and neighbourhood must be carefully considered and not compromise comfort and the enjoyment of open spaces, including water spaces, around the building…"* and that, *"…buildings should not cause adverse*

reflected glare."

Housing Supplementary Planning Guidance, 2016

13.14 The Housing SPG[vii] draws on the London Plan, primarily the relevant Policy 7.6Bd, and provides further guidance on standards for daylight and sunlight.

13.15 The guidance states that

> *"an appropriate degree of flexibility needs to be applied when using BRE guidelines to assess the daylight and sunlight impacts of new development on surrounding properties, as well as within new developments themselves."*

13.16 It continues *"…guidelines should be applied sensitively to higher density development…where BRE advice suggests considering the use of alternative targets" taking in to account the "local circumstances; the need to optimise housing capacity; and scope for character and form of an area to change over time."*

13.17 It is also stated that *"natural light is also vital to a sense of wellbeing in the home, and this may be restricted in densely developed parts of the city." Housing that provides "comfortable and enjoyable places of retreat and privacy. Factors to be considered include…daylight and sunlight."*

Sustainable Design and Construction Supplementary Planning Guidance, 2014

13.18 Section 2.3 of the Sustainable Design and Construction SPG[viii] provides guidance on key areas such as site layout and micro-climate in relation to site layout and building design.

13.19 With regard to site layout the guidance states that

> *"measures to reduce carbon dioxide emissions include enabling access to daylight and sunlight for uses that require [light]." In addition, the guidance states that "site planning can minimise the impact of the shadow created by the new buildings to protect existing features such as open space and renewable solar technologies on roofs." It goes on to say that "developers should ensure the layout of their site and buildings maximises the opportunities provided by natural systems, such as light."*

13.20 The SPG continues with effects on the micro-climate caused by new buildings which include "*overshadowing and reducing access to sunlight."*

13.21 The guidance states that the above effects should

> *"be considered during the design of a development and assessed once the designed is finalised."*

13.22 For light pollution, the SPG provides additional information of types of light pollution including glare, light trespass and sky glow. The guidance goes on to the potential harmful effects from light pollution and how to design lighting appropriately to minimise nuisance following the Institution of Lighting Engineers, Guidance Notes for the Reduction of Obtrusive Light (2011)[xv]

Local Planning Policy

London Borough of Wandsworth, Core Strategy, 2016

13.23 LBW's adopted Core Strategy[ix] does not contain any specific policies relevant to daylight, sunlight,or overshadowing or light pollution.

London Borough of Wandsworth, Development Management Policies Document, 2016

13.24 LBW's adopted Development Management Policies Document[x] (DMPD) stipulates that care in the design of buildings needs to be taken to ensure that the potential impacts, including on daylight and sunlight are avoided, remedied or avoided on surrounding neighbours.

13.25 'Policy DMS 1 - General development principles - Sustainable urban design and the quality of the environment' of the DMPD states that in terms of daylight, sunlight and overshadowing, *"Planning permission will be granted for developments which comply with the following criteria where relevant:*

- *Does not harm the amenity of occupiers/users and nearby properties through unacceptable noise, vibration, traffic congestion, air pollution, overshadowing, overbearing, unsatisfactory outlook, privacy or sunlight/daylight; and*
- *Minimise light pollution and reduce harmful effects on neighbours and wildlife."*

13.26 'Policy DMS 4 – Tall Buildings' of the DMPD also states in terms of daylight, sunlight and overshadowing that, *"proposals will trigger assessment against the detailed criteria in Policy DMS4b in the following circumstances:*

13.27 *Describe how the proposal addresses the climatic effects on its surroundings including*

overshadowing, the diversion of wind speeds at ground level, heat islands and glare reduction; and

13.28 *Describe how the proposal has been designed to create high quality public spaces. Particular consideration should be given to climatic comfort, the need for sun, light and shade, compatibility of adjacent uses and the quality of materials."*

13.29 In addition, the DMPD states that,

> *"care in the design of buildings needs to be taken to ensure that the scale and massing is appropriate to the location, and potential impacts on neighbours, such as noise, loss of outlook, privacy or sunlight/daylight are avoided, remedied or mitigated."*

London Borough of Wandsworth, Site Specific Allocations, 2016

13.30 LBW's Site Specific Allocations[xi] states that:

> *"Any new development must not cause unreasonable loss of daylight and sunlight to any habitable rooms in residential property adjoining the site. It is also important to avoid significantly reducing sunlight to private gardens or any communal amenity space. The impact of any new buildings adjacent to all boundaries but especially the northern and eastern boundaries will be assessed and should meet the standards specified in the BRE Trust document - Site Layout Planning for Daylight and Sunlight - A Guide to Good Practice 2011."*

13.31 In Addition, the LBW's Site Specific Allocation states, *"Given that average building heights of around 8 - 10 storeys are expected, it will be important to set buildings far enough apart to avoid a canyon-like appearance and ensure that adequate sunlight penetrates public spaces."*

Other Relevant Policy, Standards and Guidance

Historic England Guidance on Tall Buildings – Historic England Advice Note 4 (2015)

13.32 Paragraph 4.10 of the Historic England Advice Note 4[xii] recommends that the following should be addressed in relation to tall buildings:

> *"consideration of the impact on the local environment, including microclimate, overshadowing, night-time appearance, vehicle movements and the environment and amenity of those in the vicinity of the building".*

Building Research Establishment (BRE) Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition (2011)

13.33 The Building Research Establishment (BRE) Guidelines 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2011, 2nd edition' (released October 2011)[i] provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. It is intended for use by building designers, developers, consultants and Local Planning Authorities (LPAs). The advice it gives is not mandatory and should not be used as an instrument of planning policy, it states:

> *"This guide is a comprehensive revision of the 1991 edition of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location."*

13.34 It also states:

> *"The advice is 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" (para.1.6).*

13.35 In addition, the BRE Guidelines state (para. 1.3) that

> *"it is intended to be read in conjunction with the interior daylighting recommendations in the British Standard 8206-2 Code of practice for daylighting, and in the CIBSE publication Lighting guide: daylighting and window design".*

British Standard (BS) 8206 Part 2; Lighting for buildings. Code of practice for daylighting (2008)

13.36 The British Standard 8206 part 2[xiii] provides recommendations regarding the design for daylight in buildings and sets out various methods for assessing daylight. The document states:

> *"Daylighting gives to a building a unique variety and interest. An interior which looks gloomy, or which does not have a view to the outside when this could reasonably be expected, will be considered unsatisfactory by its users."*

Daylighting and window design: Lighting Guide LG10 (CIBSE) (2014)

13.37 This guide[xiv] replaces the CIBSE Applications Manual Window Design (1999) and provides a daylight design guide. It states:

> *"There are three main drivers for improving the daylighting of buildings:*
> - *energy consumption;*
> - *benefits to human health and wellbeing; and*
> - *appearance of the space."*

13.38 The guide also lists *'establishing potential impacts on neighbours'* in terms of reflected sunlight, spacing and building form early within the daylighting design process.

Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light GN01:2011 (2011)

13.39 The ILP[xv] document entitled *"Guidance Notes for the Reduction of Obtrusive Light"* provides quantitative criteria for acceptable levels of light pollution and distinguishes between rural and dense urban areas.

Assessment Methodology

13.40 For the daylight and sunlight assessment, the study area was defined by the extent of residential properties which have windows facing the Site and that, using professional experience, were considered in close enough proximity to the Site to be affected by the Development.

Baseline Characterisation

13.41 A baseline characterisation was completed by firstly undertaking a review of the surrounding land uses using information and data sourced from the Council Tax website. This review was undertaken for all surrounding properties in close proximity to the Site and identified as potential sensitive receptors.

13.42 This was followed by a Site visit to confirm existing conditions around the Site.

13.43 Based on the above, a 3D AutoCad model was developed for the existing surrounding properties and existing buildings on site using a photogrammetric survey, Site photographs and OS map.

13.44 The understanding of the Baseline Conditions is shown in Drawings 10857/01/01/01 in Appendix 13.1.

Scenarios Assessed

13.45 The following scenarios have been assessed and are reported within this chapter of the ES:

- Baseline;
- Demolition and construction; and
- Development.

Baseline

13.46 This scenario considers the current baseline conditions (at the time of writing this chapter). This scenario is depicted on drawings 10857/11/02/01 (Appendix 13.1).

Demolition and Construction

13.47 The demolition and construction scenario has been assessed qualitatively, based on professional judgment, given the indicative construction methodology and phasing set out in Chapter 5 of this ES.

The Development

13.48 This scenario consists of the Development in the context of the surrounding existing environment. This scenario has assessed the potential daylight, sunlight, overshadowing and light pollution effects of the Development on the surrounding residential receptors and amenity spaces. In ascertaining the impacts, comparisons are made with the baseline.

13.49 The Development consists of a detailed and outline element, both of which have been considered within this chapter. Both elements have been considered for daylight, sunlight, overshadowing and light pollution. The Development scenario is illustrated on drawings no. 10857/11/01/01 in (Appendix 13.1).

13.50 Using professional judgment, a cumulative scenario is not considered necessary due to the distance and relative low-rise nature of the nearest consented scheme (and therefore those more distant) from the Site. The massing of the schemes described in Chapter 2 would therefore not be close enough physically to combine with the Development and lead to likely

significant cumulative effects.

Methodology for Determining Demolition and Construction Effects

13.51 Owing to the evolving and changing nature of demolition and construction activities, the assessment of potential effects during demolition and construction of the Development on daylight, sunlight, overshadowing and light pollution to surrounding properties has not been modelled. Instead, a qualitative assessment has been undertaken using professional judgement and based on the outline construction methodology and phasing set out in Chapter 5 of this ES.

Methodology for Determining Baseline Conditions and Sensitive Receptors

13.52 The BRE Guidelines suggest that residential properties have the highest requirement for daylight and sunlight and states that:

> *"the guidelines are intended for use for rooms in adjoining dwellings where light is required, including living rooms, kitchens and bedrooms."*

13.53 The residential properties that have been considered due to their proximity to the Site and are highlighted in pink on Figure 13.2.

Receptors considered sensitive to overshadowing

13.54 Owing to the southern location of the sun's path, only the amenity areas located to the north of the Site have been considered. The public and communal areas of amenity that have been identified as sensitive receptors are presented on Figure 13.3.

Receptors considered sensitive for light pollution

13.55 The properties considered sensitive in regard to light pollution are all internal to the Site. There are none adjacent or in the surrounding area that would be affected. Therefore, the assessment shows the effects caused by commercial elements of the Development on the residential element of the Development.

Methodology for Determining Operational Effects

13.56 The following methodologies are used to assess the daylight and sunlight effects on the sensitive receptors of surrounding properties when the Development is completed and

operational:

- Daylight:
  - Vertical Sky Component (VSC); and
  - No Sky Line (NSL) Method.
- Sunlight:
  - Annual Probable Sunlight Hours (APSH).

13.57 The methodology used for assessing the overshadowing effects on external amenity areas is Transient Overshadowing.

13.58 The following methodology has been used to assess the potential light pollution effects:

- Light Intrusion;

Outline Approach for Daylight, Sunlight, Overshadowing and Light Pollution

13.59 The technical analyses carried out to inform the assessments have been undertaken by creating a digital three dimensional (3D) model of the existing Site and Development, based on photogrammetric survey, Site photographs and OS map.

Daylight

Vertical Sky Component

13.60 The VSC method of assessment is defined in the BRE Guidelines as the:

> *"ratio of that part of illuminance at a point on a given vertical plane that is received directly from a CIE standard overcast sky, to illuminate on a horizontal plane due to an unobstructed hemisphere of this sky".*

13.61 The 3D model uses Waldram Diagrams to establish the VSC and 3D geometric calculations for daylight distribution. This model (which is orientated to north by the use of Ordnance Survey (OS) information) enables the path of the sun to be tracked throughout the year to establish the shadow cast by the existing and proposed buildings, and thus calculate the sun hours on ground in each scenario.

13.62 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 Development in terms of light.

13.63 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.

13.64 The maximum VSC value is almost 40% for a completely unobstructed vertical wall or window. In terms of assessment criteria, the BRE Guidelines state that:

> *"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

13.65 The BRE Guidelines state that where room layouts are known, the effect on the daylight distribution can be calculated by plotting the NSL.

13.66 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 0.85m 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.

13.67 Where actual room layouts were available, these have been 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. 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 (14 ft) room depth has been assumed, unless the building form dictated otherwise. This is common practice where access to buildings for surveying is unavailable.

13.68 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 will 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.

13.69 BS 8206 Part 2 states (para 5.7) that the:

> *"uniformity of daylight is considered to be unsatisfactory if a significant part of the working plane (normally more than 20%) lies behind the no-sky line".*

13.70 Therefore, an NSL of at least 80% would be considered satisfactory.

13.71 In relation to deep rooms lit by windows on one side, the BRE Guidelines state (para. 2.2.10):

> *"If an existing building contains rooms lit from one side only and greater than 5 m deep, then a greater movement of the no sky line may be unavoidable."*

Sunlight

Annual Probable Sunlight Hours

13.72 APSH is measured using a sun indicator containing 100 spots, each representing 1% of APSH. Therefore, where no obstruction exists the total annual probable sunlight hours would amount to 1486 hours and therefore each spot equates to 14.86 hours of the total annual sunlight hours.

13.73 The number of spots is calculated for the baseline and Development scenarios during the year and also during the winter period, and a comparison made between the two. This provides a percentage of APSH for each window assessed.

13.74 The BRE Guidelines note that:

> *"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.";* and
> *"…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".*

13.75 In relation to existing surrounding receptors, the BRE Guidelines state that a window would

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 total APSH which is greater than 4%.

13.76 BS 8206 Part 2 (section 5.2) states that:

> *"Provided that the entry of sunlight is properly controlled, it is generally welcome in most buildings in the UK. Dissatisfaction can arise as much from the permanent exclusion of sunlight as from its excess. The provision of sunlight is important in dwellings, particularly during winter months. Sunlight is especially valued in habitable rooms used for long periods during the day."*
> *"Interiors in which the occupants have a reasonable expectation of direct sunlight should receive at least 25% of probable sunlight hours (see 2.10.2). At least 5% of probable sunlight hours should be received during the winter months, between 21 September and 21 March. Sunlight is taken to enter an interior when it reaches one or more window reference points."*

13.77 It is often not possible to determine the room uses within each of the neighbouring properties, nor is 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 have been considered in the assessment.

Summary of Criteria for Daylight and Sunlight

13.78 The following table provides a summary of the criteria set out within the BRE Guidelines for daylight and sunlight.

Table 13.1: Summary of Daylight and Sunlight Assessment Criteria

Method	BRE Criteria
VSC	A window would be adversely affected if its VSC measured at the centre of the window is less than 27% and less than 0.8 times is former value.
NSL	A room would be adversely affected if the daylight distribution (NSL) is reduced beyond 0.8 times its existing area.
APSH	A window would be adversely affected if a point at the centre of the window received 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 for existing neighbouring buildings, if there is a reduction in total APSH which is greater than 4%.

Overshadowing

Transient Overshadowing

13.79 Where a proposed development includes tall buildings, these may affect the sunlight availability to gardens or open spaces in close proximity to the Site. Owing to the southerly location of the sun path, only amenity areas located within 90° of due north of the Development have the potential to be affected by overshadowing from tall buildings and therefore taken into consideration in this assessment.

13.80 The 2011 BRE guidelines suggest plotting a series of shadow plans illustrating the location of shadows cast from those buildings at different times of the day and period of the year to assess the potential overshadowing effects. To this end, the overshadowing plots are mapped for the three key dates listed below:

- 21st March (Spring Equinox);
- 21st June (Summer Solstice); and
- 21st December (Winter Solstice).

13.81 The 21st September (Autumn Equinox) is not assessed owing to the identical solar altitude and therefore equivalent outcomes of overshadowing to those presented for 21st March.

13.82 For each of these dates, the overshadowing is calculated at hourly intervals throughout daylight hours from sunrise to sunset. On 21st December, the sun is at its lowest altitude consequently creating long shadows to be cast and represents the worst-case scenario in terms of overshadowing.

13.83 The analysis described above varies according to different latitudes. The Site is located within London, which is at a latitude of 51.5° north.

Light Pollution

13.84 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. The ILP Guidance Notes provide suggested lighting level values to ascertain the acceptability of lighting levels of light pollution.

13.85 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, or needless spillage into the night sky.

13.86 It should also be noted that the ILP Guidance relates and refers to external luminaires. However, 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.

13.87 Potential light pollution effects of a new 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.

13.88 As the external lighting design is not available at this stage, sky glow and building luminance cannot be accurately simulated. Any outdoor lighting would be subject to planning conditions and therefore, should any emerging external lighting be designed in accordance with the ILP recommendations, no sky glow or building luminance issues are expected to arise.

13.89 Similarly, the internal lighting design has not yet been developed and therefore the luminaire intensity cannot be accurately simulated, either. However typical office lighting includes recessed luminaires shielded from the observer's sight which have a low potential for impacts in terms of glare, therefore a luminaire intensity study was not undertaken.

13.90 Even though the internal lighting design has not yet been developed in detail, it is reasonable to assume that for office spaces, an average illuminance level of 500 lux would be required at working plane height. Therefore, this assumption has been used to carry out an indicative

study in order to highlight any potential issues of light intrusion into residential receptors directly facing the proposed office spaces within block O.

13.91 Other uses such as retail, lobby and circulation spaces will have varying amounts of light and different lighting designs/luminaires and therefore a standard assumed lighting design is not considered appropriate. Therefore, only a light intrusion assessment has been undertaken.

13.92 There are no other areas within the detailed component of the masterplan where office spaces are proposed that have the potential to cause light intrusion into residential properties.

13.93 As the light pollution assessment focussed on the accommodation within the application site only, effectively the baseline does not include any proposed light sources. Any existing office spaces outside the site are not located in close proximity and as such unlikely to cause light intrusion to the properties within the site. External lighting is typically mounted on masts and directed downwards, so the likelihood of any light spillage affecting residential receptors is very low. Light spillage from residential receptors is also very unlikely, as residential lighting has typically a lower intensity, is located at sufficient distance from other residential receptors, and is turned off at night.

13.94 Therefore, the results of the light pollution assessment is considered a fair representation of the maximum potential levels experienced by residential receptors within the Site. If the detailed lighting design is developed in accordance with the ILP, no light pollution issues are considered likely to arise.

Light Intrusion Methodology

13.95 Light pollution is not a comparative assessment; the fact it may occur in the baseline does not necessarily justify its occurrence as a result of the Development. Therefore, the assessment considers the effect of the Development in absolute terms, by reference to the relevant guidance levels.

13.96 The assessment has been undertaken by preparing a computer generated 3D model of the Development and using specialist lighting simulation software. The light fittings used for this lighting simulation represent typical recessed office luminaires regularly spaced on the proposed office ceilings within the proposed commercial building in order to achieve 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 for the purpose of the light pollution assessment. For this reason, it should be considered a worst-case scenario.

13.97 The table below sets out the environmental zones as per the ILP Guidance which have been applied in this Light Intrusion assessment.

Table 13.2: ILP Light Intrusion Criteria for Environmental Zones

Environmental Zone	Light Intrusion (into windows) Ev (Lux) (2)	
	Pre-curfew	Post-curfew
E0 – Dark areas (e.g. UNESCO Starlight Reserves, IDA Dark Sky Parks)	0	0
E1- Intrinsically dark areas (e.g. National Parks, areas of outstanding natural beauty)	2	0 (1*)
E2- Low district brightness (e.g. rural or small village locations)	5	1
E3- Medium district brightness (e.g. small town centres or urban locations)	10	2
E4- High district brightness (e.g. town/city centres with high levels of night time activity)	25	5
Notes: Ev = Vertical Illuminance in Lux and is measure flat on the glazing at the centre of the window 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.		

13.98 With reference to Table 13.2, taken from the ILP guidance, the Site is classified as environmental zone E3. This zone allows for a maximum pre-curfew light intrusion level of 10 lux and a maximum post-curfew light intrusion level of 2 lux.

Significance Criteria

13.99 The assessment of the significance of effects outlined within the below sections is consistent with the terminology and criteria outlined within Chapter 2: EIA Methodology of this ES and accords with the relevant standards and guidance.

13.100 The terminology used to describe the sensitivity of resources/receptors and magnitude of the effect is as follows:

- High;
- Medium; and
- Low.

13.101 The key terminology used to describe the scale of effects is as follows and is further described

in the below sections of this chapter:

- Major;
- Moderate;
- Minor; and
- Negligible.

13.102 The nature of the effects may be either Adverse (negative or detrimental), Beneficial (advantageous or positive) or Neutral (equally beneficial and adverse).

13.103 Where the impact (change) would have no discernible effect to a receptor, the effect has been stated as Negligible.

13.104 Following the determination of the significance of an effect, using this methodology a clear statement is then made as to whether the effect is significant or not significant. As a general rule, the following criteria is applied:

- *'Moderate' or 'major' effects are deemed to be 'significant';*
- *'Minor' effects are considered to be 'significant'; and*
- *'Negligible' effects are considered to be 'not significant' and not a matter of local or wider concern.*

Evaluation Effects and Significance – Daylight, Sunlight, Overshadowing and Light Pollution

Daylight and Sunlight

13.105 For daylight and sunlight, the BRE Guidelines outline the following approach within the accompanying appendix, in terms of assigning criteria to assess the effects:

> "*Adverse impacts occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space… The assessment of impact will depend on a combination of factors, and there is no simple rule of thumb that can be applied.*"
>
> "*Where the loss of skylight or sunlight 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 or limited area of open space 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 or open space are affected, a Minor Adverse impact would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space.*"

> "*Where the loss of skylight or sunlight does not meet the guidelines in this book, the impact is assessed as Minor, Moderate or Major Adverse. Factors tending towards a Minor Adverse impact include:*
> - Only a small number of windows or limited area of open space are affected;
> - The loss of light is only marginally outside the guidelines;
> - An affected room has other sources of skylight or sunlight; and
> - The affected building or open space only has a low level of requirement for skylight or sunlight."

13.106 The classification of Major Adverse is documented within paragraph 7 of the BRE Guidelines as follows:

> "Factors tending towards a Major Adverse impact include:
> - *a large number of windows or large area of open space are affected;*
> - *the loss of light is substantially outside the guidelines;*
> - *all the windows in a particular property are affected; and*
> - *the affected indoor or outdoor spaces have a particular strong requirement for skylight or sunlight, e.g. a living room in a dwelling or a children's playground".*

13.107 Where the BRE Guidelines are met, the effects would be considered negligible.

13.108 Taking into consideration the BRE Guidelines, professional judgement has been used to determine whether the likely effects would result in adverse or beneficial daylight and sunlight effects. The initial numerical criteria for determining the scale of effect for VSC, NSL and APSH is based on percentage alterations, as follows:

- 0-19.9 % alteration = Negligible
- 20-29.9 % alteration = Minor;
- 30-39.9 % alteration = Moderate; and
- 40 % alteration = Major.

13.109 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 one example of when professional judgement is taken into account.

13.110 Therefore, when assigning an overall significance per property, consideration has been given to the proportion of rooms/windows affected, as well as the percentage alterations, absolute changes, and any other relevant factors, such as there may be mitigating factors such as balconies, overhangs or design features which may also affect the determination of assigning

the criteria.

13.111 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 Development.

13.112 Where the scale of VSC levels and NSL levels within a property differ, professional judgement has also been used to determine an overall significance. In addition, if the scale of total APSH and winter APSH differ greatly, professional judgement has also been used to determine the significance of the effect. This has been based on the factors previously stated.

Overshadowing

Transient Overshadowing

13.113 The BRE Guidelines do not include criteria for the 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.

13.114 The assessment of likely effects as a result of transient overshadowing has therefore been 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 Development. In addition, professional judgement considers the quantum of shade cast on an area as well as the areas use.

Light Pollution

13.115 The ILP Guidance Notes do not provide details on assigning of significance of effects for light pollution, therefore this 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.

Assumptions and Limitations

13.116 Where actual room layouts were available (noted in appendix 13.2), these have been considered when modelling the internal layouts of surrounding properties. The properties where internal layouts were obtained are listed below:

- 2 Rodway Road;
- 185 Roehampton Lane;
- 193 Roehampton Lane;
- 201 Roehampton Lane;
- Chadwick Hall;
- 1-8 Cleeve Way;
- Newbury House;
- Queen Mary's House; and
- Whitelands College.

13.117 Where layout information was not available, assumptions have been made as to the internal configuration of the rooms (from external observations) behind the fenestration observed. No assumptions have been made on the use of the rooms and these are noted as "unknown" within appendix 13.2. 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.

13.118 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.

Baseline Conditions

13.119 The Baseline Condition is shown in Drawings 10857/01/01/01 in ES Appendix 13.1.

13.120 The location of the sensitive receptors considered in this assessment is shown in Figure 13.2.

Existing Sensitive Receptors

Daylight and Sunlight

13.121 The assessment methodology section confirms that existing residential receptors are sensitive receptors that may be affected by the Development. The sensitive receptors can be seen in Figure 13.2/13.3 and are in Table 13.3. All failing rooms and windows are highlighted in a Pass/Fail column for clarity within Appendix 13.2.

13.122 The sensitive receptors assessed for daylight and sunlight are as follows:

Table 13.3: Sensitive Receptors

Receptor	
WOODCOTT HOUSE	37 LAVERSTOKE GARDENS
LYNDHURST HOUSE	1 LAVERSTOKE GARDENS
WHEATLEY HOUSE	49 LAVERSTOKE GARDENS
HURSTBOURNE HOUSE	245-255 DANEBURY AVENUE
NEWBURY HOUSE	ST JOSEPH'S - 218 ROEHAMPTON LN
1-8 CLEEVE WAY	41-71 HERSHAM CLOSE
51 MINSTEAD GARDENS	73-95 HERSHAM CLOSE
53 MINSTEAD GARDENS	199 ROEHAMPTON LANE
55 MINSTEAD GARDENS	195 ROEHAMPTON LANE
57 MINSTEAD GARDENS	197 ROEHAMPTON LANE
59 MINSTEAD GARDENS	189 ROEHAMPTON LANE
61 MINSTEAD GARDENS	187 ROEHAMPTON LANE
63 MINSTEAD GARDENS	183 ROEHAMPTON LANE
65 MINSTEAD GARDENS	181 ROEHAMPTON LANE
68 MINSTEAD GARDENS	211-213 ROEHAMPTON LANE
70 MINSTEAD GARDENS	BLOCK B - QUEEN MARY'S HOUSE
72 MINSTEAD GARDENS	171 ROEHAMPTON LANE
74 MINSTEAD GARDENS	185 ROEHAMPTON LANE
76 MINSTEAD GARDENS	193 ROEHAMPTON LANE
78 MINSTEAD GARDENS	201 ROEHAMPTON LANE
80 MINSTEAD GARDENS	2 RODWAY ROAD
82 MINSTEAD GARDENS	WHITELANDS COLLEGE
84 MINSTEAD GARDENS	CHADWICK HALL
86 MINSTEAD GARDENS	1 RODWAY ROAD
13 LAVERSTOKE GARDENS	257-261 DANEBURY AVENUE
25 LAVERSTOKE GARDENS	

Overshadowing

Receptor	
Woodcott House	197 Roehampton Lane
Lyndhurst House	189 Roehampton Lane
Wheatley House	187 Roehampton Lane
Hurstbourne House	183 Roehampton Lane
Newbury House	181 Roehampton Lane
1-8 Cleeve Way	211-213 Roehampton Lane
13 Laverstoke Gardens	Block B - Queen Mary's House
25 Laverstoke Gardens	171 Roehampton Lane
37 Laverstoke Gardens	185 Roehampton Lane
1 Laverstoke Gardens	193 Roehampton Lane
49 Laverstoke Gardens	201 Roehampton Lane
245-255 Danebury Avenue	2 Rodway Road
41-71 Hersham Close	Whitelands College

Receptor	
73-95 Hersham Close	Chadwick Hall
199 Roehampton Lane	1 Rodway Road
195 Roehampton Lane	257-261 Danebury Avenue

13.123 The transient overshadowing assessments plots the shadow cast by the Development on the surrounding space with no specific reference to any amenity areas. Both public amenity areas and private gardens were assessed. The amenity areas assessed can be seen Figure 13.3.

Light Pollution

13.124 No sensitive receptors external to the Site are in close enough proximity (≤ 20m) to be affected by Light Pollution. Therefore, the Light Pollution assessment within this chapter focuses on the Light Pollution effects from commercial elements of the Development on residential elements within the Site.

13.125 Light pollution is not a comparative assessment, as the aim is to determine if any residential receptor could be affected by light spillage from the Proposed Development. There is a maximum allowed level defined within the ILP guidance that cannot be breached. Any breaches occurring in a given scenario would not justify their occurrence in another one. The assessment is not meant to be compared to a baseline, but to be evaluated in absolute terms.

Existing Daylight and Sunlight Levels

13.126 The full baseline daylight and sunlight can be found within Appendix 13.2 and is summarised in Table 13.4. and discussed in more detailed below. More information is provided on sensitive receptors considered within this assessment below.

Table 13.4: Summary of baseline VSC and NSL levels for neighbouring sensitive receptors

Address	Total No. Windows That Meet VSC Criteria (>27%)		Total No. Of Rooms That Receive NSL In Excess Of 80%		Total No. Of Rooms That Meet APSH Criteria	
	Total Assessed	Total That Meet Criteria	Total Assessed	Total That Meet Criteria	Total Assessed	Total That Meet Criteria
Woodcott House	146	111	143	143	110	81
Lyndhurst House	146	111	143	143	110	90
Wheatley House	146	111	143	143	110	98
Hurstbourne House	146	111	143	143	110	80
Newbury House	29	29	20	20	12	12
1-8 Cleeve Way	47	41	35	34	14	13

Address	Total No. Windows That Meet VSC Criteria (>27%)		Total No. Of Rooms That Receive NSL In Excess Of 80%		Total No. Of Rooms That Meet APSH Criteria	
	Total Assessed	Total That Meet Criteria	Total Assessed	Total That Meet Criteria	Total Assessed	Total That Meet Criteria
13 Laverstoke Gardens	4	4	4	4	2	2
25 Laverstoke Gardens	4	4	4	4	2	2
37 Laverstoke Gardens	4	4	4	4	2	2
1 Laverstoke Gardens	4	4	4	4	2	2
49 Laverstoke Gardens	16	16	12	12	8	8
245-255 Danebury Avenue	18	4	12	12	0	0
41-71 Hersham Close	8	8	8	8	0	0
73-95 Hersham Close	48	24	48	48	0	0
199 Roehampton Lane	6	4	5	5	5	5
195 Roehampton Lane	11	3	6	6	6	5
197 Roehampton Lane	10	6	5	5	5	5
189 Roehampton Lane	28	15	6	6	6	5
187 Roehampton Lane	27	19	6	6	6	6
183 Roehampton Lane	7	6	4	4	4	4
181 Roehampton Lane	16	11	6	6	6	6
211-213 Roehampton Lane	5	4	4	4	4	4
Block B - Queen Mary's House	66	50	27	22	18	18
171 Roehampton Lane	90	75	58	58	0	0
185 Roehampton Lane	4	3	3	3	3	3
193 Roehampton Lane	10	5	5	4	5	4
201 Roehampton Lane	15	10	6	6	6	6
2 Rodway Road	11	10	8	8	2	2
Whitelands College	119	117	118	116	23	23
Chadwick Hall	24	8	21	18	12	12
1 Rodway Road	11	11	7	7	7	7
257-261 Danebury Avenue	9	2	6	6	0	0
Total	**1235**	**941**	**1026**	**1012**	**600**	**505**

13.127 Of the 32 properties considered as sensitive receptors, a total of 1,235 windows serving 1,026 rooms were assessed for daylight and 600 rooms were assessed for sunlight.

13.128 For daylight in the baseline condition, 941 (76 %) of the 1,235 windows assessed for VSC and 1,012 (99%) of the 1,026 rooms assessed for NSL would meet BRE criteria for daylight. For sunlight, 505 (84 %) of the 600 rooms assessed meet BRE criteria.

13.129 As the baseline results show overall existing compliance to BRE guidelines, the results are not directly comparable to the tables within the likely significant effects section that show

alterations from this baseline.

Transient Overshadowing

13.130 The full baseline transient overshadowing images can be found in Appendix 13.3. Due to the relatively low-rise nature of the existing Site, minimal shadow is cast from the existing buildings on the Site and the surrounding amenity areas are unaffected by overshadowing from the Site on 21 March, 21 June and 21 December.

Future Baseline

13.131 The future baseline, without the implementation of the Development is likely to be that consistent with the information presented under the 'Baseline Assessment' section of this ES Chapter.

Likely Significant Effects

Construction Phase

13.132 The magnitude of impact and so resultant likely significant effect in relation to the daylight and sunlight amenity and overshadowing for the surrounding properties and amenity areas would vary throughout the demolition and construction stage of the Development, depending on the level of obstruction caused. The impact would almost certainly be less than that of the completed Development, given that the extent of permanent massing would increase throughout the construction stage, until the buildings are complete.

13.133 The impacts of the construction of the Development would steadily increase in magnitude as the superstructure is built and then clad. Those effects that are perceptible, as the superstructure and cladding progress, would be similar to those during the completion and occupation of the Development as presented below. It is therefore considered that the completed Development represents the worst-case assessment in terms of likely daylight, sunlight and overshadowing effects.

13.134 During the construction phase, 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.

13.135 On this basis, no further consideration is given to effects to daylight, sunlight, overshadowing

as a result of the demolition and construction works. The remainder of this chapter focuses on the effects relating to the completed Development as this would be considered the worst-case scenario.

Operational Phase

Daylight

13.136 The full daylight assessment for the Development can be found within Appendix 13.2 and is summarised in Table 13.5. Appendix 13.2 shows in all windows and rooms that do not meet BRE guidelines highlighted in a Pass/Fail column for clarity within the Appendix.

13.137 In terms of daylight and sunlight, measures including massing alterations were implemented during the design process to minimise the impacts on daylight to surrounding sensitive receptors as much as possible while still ensuring the provision of a viable scheme (the design evolution is summarised in Chapter 4 of this ES and described in detail in the Design, Landscape and Access Statement submitted in support of the planning application).

13.138 Overall, of the 1,235 windows assessed for VSC, 1,018 would meet BRE criteria. Of the 1,024 rooms assessed for NSL, 942 would meet BRE criteria.

13.139 The 16 properties highlighted in blue in Table would experience no or little alteration below 20%, and the effect on daylight to these properties would therefore be negligible.

13.140 The remaining affected properties are discussed in detail below.

Table 13.5: Summary of VSC and NSL levels for neighbouring sensitive receptors with the Development in place

Address	VSC						NSL					
			Below BRE Guidelines						Below BRE Guidelines			
	No. of Total Windows	No. Windows that meet BRE criteria	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	Total	No. of Total Rooms	No. Rooms that meet the former 0.8 times value criteria	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	Total
Wheatley House	146	142	3	1	0	4	143	143	0	0	0	0
Hurstbourne House	146	146	0	0	0	0	143	143	0	0	0	0
Newbury House	29	29	0	0	0	0	20	20	0	0	0	0
1-8 Cleeve Way	47	47	0	0	0	0	35	35	0	0	0	0
13 Laverstoke Gardens	4	4	0	0	0	0	4	4	0	0	0	0
25 Laverstoke Gardens	4	4	0	0	0	0	4	4	0	0	0	0
37 Laverstoke	4	4	0	0	0	0	4	4	0	0	0	0

Address	VSC						NSL					
	No. of Total Windows	No. Windows that meet BRE criteria	Below BRE Guidelines				No. of Total Rooms	No. Rooms that meet the former 0.8 times value criteria	Below BRE Guidelines			
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	Total			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	Total
Gardens												
1 Laverstoke Gardens	4	4	0	0	0	0	4	4	0	0	0	0
49 Laverstoke Gardens	16	16	0	0	0	0	12	12	0	0	0	0
245-255 Danebury Avenue	18	6	5	1	6	12	12	10	1	1	0	2
41-71 Hersham Close	8	8	0	0	0	0	8	8	0	0	0	0
73-95 Hersham Close	48	19	2	10	17	29	48	33	6	2	7	15
199 Roehampton Lane	6	5	1	0	0	1	5	5	0	0	0	0
195 Roehampton Lane	11	8	0	1	2	3	6	6	0	0	0	0
197 Roehampton Lane	10	8	2	0	0	2	5	5	0	0	0	0
189 Roehampton Lane	28	23	1	1	3	5	6	6	0	0	0	0
187 Roehampton Lane	27	20	7	0	0	7	6	6	0	0	0	0
183 Roehampton Lane	7	7	0	0	0	0	4	4	0	0	0	0
181 Roehampton Lane	16	16	0	0	0	0	6	6	0	0	0	0
211-213 Roehampton Lane	5	5	0	0	0	0	4	4	0	0	0	0
Block B - Queen Mary's House	66	66	0	0	0	0	27	27	0	0	0	0
171 Roehampton Lane	90	90	0	0	0	0	58	57	1	0	0	1
185 Roehampton Lane	4	4	0	0	0	0	3	3	0	0	0	0
193 Roehampton Lane	10	8	1	0	1	2	5	5	0	0	0	0
201 Roehampton Lane	15	11	2	0	2	4	6	6	0	0	0	0
2 Rodway Road	11	11	0	0	0	0	8	8	0	0	0	0
Whitelands College	119	29	2	37	51	90	118	63	19	18	18	55
Chadwick Hall	24	10	6	4	4	14	21	12	6	1	2	9
1 Rodway Road	11	11	0	0	0	0	7	7	0	0	0	0
257-261 Danebury Avenue	9	6	0	0	3	3	6	6	0	0	0	0
TOTAL	**1235**	**1018**	**47**	**68**	**102**	**217**	**1024**	**942**	**33**	**22**	**27**	**1279**

Woodcott House

13.141 A total of 146 windows serving 143 rooms were assessed for daylight within this building.

13.142 For VSC, 121 of the 146 (83%) windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.143 Of the 25 affected windows, 10 would experience an alteration in VSC between 20-29.9%

which is considered a minor adverse effect and eight would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining seven windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.144 For NSL, all 143 rooms fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.145 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse, of moderate significance.

Lyndhurst House

13.146 A total of 146 windows serving 143 rooms were assessed for daylight within this building.

13.147 For VSC, 130 of the 146 (89%) windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.148 Of the 16 affected windows five would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and five would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining six windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.149 For NSL, all 143 rooms fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.150 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse of moderate significance.

Wheatley House

13.151 A total of 146 windows serving 143 rooms were assessed for daylight within this building.

13.152 For VSC, 142 of the 146 (97%) windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.153 Of the four affected windows three would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and one would experience an alteration between 30-39.9% which is considered a moderate adverse effect.

13.154 For NSL, all 143 rooms fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.155 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse of minor significance.

245-255 Danebury Avenue

13.156 A total of 18 windows serving 12 rooms were assessed for daylight within this building.

13.157 For VSC, six of the 18 (33%) windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.158 Of the 12 affected windows, five would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and one would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining six windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.159 It should be noted that all six windows that would experience an alteration in excess of 40% have very low existing VSC levels ranging from 2.3% to 3.1% which would result in a disproportionate percentage change. The low absolute losses are unlikely to be noticeable.

13.160 For NSL, 10 of the 12 rooms fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.161 Of the two affected rooms, one would experience an alteration between 20-29.9% which is considered a minor adverse effect and one would experience an alteration between 30-39.9% which is considered a moderate adverse effect.

13.162 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse of minor significance.

73-95 Hersham Close

13.163 A total of 48 windows serving 48 rooms were assessed for daylight within this building.

13.164 For VSC, 19 of the 48 (40%) windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.165 Of the 29 affected windows, two would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and 10 would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining 17 windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.166 For NSL, 33 of the 48 rooms fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.167 Of the 15 affected rooms, six would experience an alteration between 20-29.9% which is considered a minor adverse effect and two would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining seven rooms would experience an alteration in excess of 40% which is considered a major adverse effect.

13.168 However, the windows experiencing a major adverse effect are located below deep-set balconies/walkways which inherently limit the level of available daylight and so any percentage alteration would be disproportionate due to the low existing levels of daylight. The building typology suggests that the rooms not set below deep-set balconies are likely to be bedrooms and therefore have a lesser requirement for daylight.

13.169 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse of major significance.

199 Roehampton Lane

13.170 A total of six windows serving five rooms were assessed for daylight within this building.

13.171 For VSC, five of the six windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.172 The one affected window would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect.

13.173 For NSL, all five rooms fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.174 Overall and based on professional judgement, the effect to daylight within this building would be negligible.

195 Roehampton Lane

13.175 A total of 11 windows serving six rooms were assessed for daylight within this building.

13.176 For VSC, six of the 11 (55%) windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.177 Of the three affected windows, one would experience an alteration in VSC between 30-39.9% which is considered a moderate adverse effect. The remaining two windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.178 For NSL, all six rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.179 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse of moderate significance.

197 Roehampton Lane

13.180 A total of 10 windows serving five rooms were assessed for daylight within this building.

13.181 For VSC, eight of the 10 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.182 Of the two affected windows, both would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect.

13.183 For NSL, all five rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.184 Overall and based on professional judgement, the effect to daylight within this building would be negligible.

189 Roehampton Lane

13.185 A total of 28 windows serving six rooms were assessed for daylight within this building.

13.186 For VSC, 23 of the 28 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.187 Of the five affected windows, one would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and one would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining three windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.188 It should be noted that the three windows that experience a major adverse daylight effect are small windows that are underneath a roof overhang. Therefore, the effects to these windows are largely due to the architectural features of the building.

13.189 For NSL, all six rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.190 Overall, due to the daylight effects being experienced by windows underneath a roof overhang and the negligible effect to NSL, the effect to daylight within this building would be minor adverse.

187 Roehampton Lane

13.191 A total of 17 windows serving six rooms were assessed for daylight within this building.

13.192 For VSC, 10 of the 17 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.193 All seven affected windows would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect.

13.194 For NSL, all six rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.195 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse of minor significance.

171 Roehampton Lane

13.196 A total of 90 windows serving 58 rooms were assessed for daylight within this building.

13.197 For VSC, all 90 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.198 For NSL, 57 of the 58 rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.199 The one affected room would experience an alteration between 20-29.9% which is considered a minor adverse effect.

13.200 Overall and based on professional judgement, the effect to daylight within this building would be negligible.

193 Roehampton Lane

13.201 A total of 10 windows serving five rooms were assessed for daylight within this building.

13.202 For VSC, eight of the 10 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.203 Of the two affected windows, one would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect. The remaining window would experience an alteration in excess of 40% which is considered a major adverse effect. It should be noted that both affected windows have low existing values of VSC ranging from 7% to 8.2% which may result in a disproportionate percentage change and low absolute loss in daylight.

13.204 In addition, the affected windows serve an entrance hall and partially blinkered side-return windows in the bay where the principal window would retain in excess of 27% VSC

13.205 For NSL, all five rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.206 Overall, based on professional judgement and due to the affected windows having low existing values and serving non-habitable spaces, the effect to daylight within this building would be negligible.

201 Roehampton Lane

13.207 A total of 15 windows serving six rooms were assessed for daylight within this building.

13.208 For VSC, 11 of the 15 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.209 Of the four affected windows, two would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect. The remaining two windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.210 For NSL, all six rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.211 Overall and based on professional judgement, the effect to daylight within this building would be long-term, local, adverse of minor significance.

Whitelands College (Student Accommodation)

13.212 A total of 119 windows serving 118 rooms were assessed for daylight within this building.

13.213 For VSC, 29 of the 119 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.214 Of the 90 affected windows, two would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and 37 would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining 51 windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.215 It should however, be noted that 88 of the 90 affected windows have a retained VSC level of over 15% which is considered commensurate with an urban location. In addition of the 88, 51 of the affected windows would retain over 20% VSC which is considered above average for an urban location.

13.216 For NSL, 63 of the 118 rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.217 Of the 55 affected rooms, 19 would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and 18 would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining 18 rooms would experience an alteration in excess of 40% which is considered a major adverse effect.

13.218 It is important to note that this building is student accommodation for primarily first year university students. As the vast majority of residents are likely to live within this building for only a year, this building is considered to have a lower requirement for daylight.

13.219 Overall, based on professional judgement and due to this building's lower requirement for daylight, the effect to daylight within this building would be long-term, local, adverse of moderate significance.

Chadwick Hall (Student Accommodation)

13.220 A total of 24 windows serving 21 rooms were assessed for daylight within this building.

13.221 For VSC, 10 of the 24 windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.222 Of the 14 affected windows, six would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and four would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining four windows would experience an alteration in excess of 40% which is considered a major adverse effect.

13.223 It should however, be noted that 10 of the 14 affected windows have a retained VSC level of over 15% which is considered commensurate with an urban location.

13.224 For NSL, 13 of the 21 rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.225 Of the eight affected rooms, five would experience an alteration in VSC between 20-29.9% which is considered a minor adverse effect and one would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining two rooms would experience an alteration in excess of 40% which is considered a major adverse effect.

13.226 It is important to note that this building is student accommodation and therefore residents are transient in nature. As residents are likely to live within this building for short periods of time, this building is considered to have a low requirement for daylight.

13.227 Overall, based on professional judgement and due to this building's low requirement for daylight (student accommodation), the effect to daylight within this building would be long-term, local, adverse of minor significance.

257-261 Danebury Avenue

13.228 A total of nine windows serving six rooms were assessed for daylight within this building.

13.229 For VSC, six of the nine windows assessed would meet BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.230 Of the three affected windows, all would experience an alteration in excess of 40% which is considered a major adverse effect. However, it should be noted that all three affected rooms have very low existing values of VSC ranging from 2.6% to 3.2%, far below the recommended 27%. This would result in a disproportionate change, and low absolute losses which are unlikely to be noticeable to inhabitants.

13.231 For NSL, all six rooms assessed fully comply with BRE Guideline criteria and are therefore considered to experience a negligible effect.

13.232 Overall, due to the affected windows for VSC having very low existing values and absolute losses that are unlikely to be noticeable, the effect to this building would be long-term, local, adverse of minor significance.

Sunlight

13.233 The full sunlight assessment can be found in Appendix 13.2 in of this ES and the summary results are presented in Table 13.6.

13.234 Of the 600 rooms assessed for sunlight, 505 would meet the BRE criteria for both total and winter APSH and are therefore considered a negligible effect.

13.235 The buildings and properties highlighted in blue in Table 13.6 experience little or no change in sunlight levels with the completed Development in place and are therefore considered a negligible effect. Appendix 13.2 shows in all rooms that do not meet BRE guidelines highlighted using a Pass/Fail column.

13.236 The remaining properties are discussed in detail below.

Table 13.6 Summary of APSH levels for neighbouring sensitive receptors with the Development in place

Address	Total No. of Rooms	No. Rooms that meet BRE criteria	Total APSH			Winter APSH		
			Below BRE Guidelines			Below BRE Guidelines		
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction
Woodcott House	110	99	3	2	6	0	0	7
Lyndhurst House	110	103	1	2	4	0	1	5
Wheatley House	110	108	1	1	0	0	1	1

Address	Total No. of Rooms	No. Rooms that meet BRE criteria	Total APSH			Winter APSH		
			Below BRE Guidelines			Below BRE Guidelines		
			20-29.9% Reduction	30-39.9% Reduction	>40% Reduction	20-29.9% Reduction	30-39.9% Reduction	>40% Reduction
Hurstbourne House	110	107	2	1	0	0	0	0
Newbury House	12	12	0	0	0	0	0	0
1-8 Cleeve Way	14	14	0	0	0	0	0	0
13 Laverstoke Gardens	2	2	0	0	0	0	0	0
25 Laverstoke Gardens	2	2	0	0	0	0	0	0
37 Laverstoke Gardens	2	2	0	0	0	0	0	0
1 Laverstoke Gardens	2	2	0	0	0	0	0	0
49 Laverstoke Gardens	8	8	0	0	0	0	0	0
199 Roehampton Lane	5	5	0	0	0	0	0	0
195 Roehampton Lane	6	5	1	0	0	0	0	0
197 Roehampton Lane	5	5	0	0	0	0	0	0
189 Roehampton Lane	6	5	0	1	0	0	0	0
187 Roehampton Lane	6	6	0	0	0	0	0	0
183 Roehampton Lane	4	4	0	0	0	0	0	0
181 Roehampton Lane	6	6	0	0	0	0	0	0
211-213 Roehampton Lane	4	4	0	0	0	0	0	0
Block B - Queen Mary's House	18	18	0	0	0	0	0	0
185 Roehampton Lane	3	3	0	0	0	0	0	0
193 Roehampton Lane	5	4	0	0	1	0	0	1
201 Roehampton Lane	6	6	0	0	0	0	0	0
2 Rodway Road	2	2	0	0	0	0	0	0
Whitelands College	23	23	0	0	0	0	0	0
Chadwick Hall	12	12	0	0	0	0	0	0
1 Rodway Road	7	7	0	0	0	0	0	0
TOTAL	**600**	**574**	**8**	**7**	**11**	**0**	**2**	**14**

Woodcott House, Lyndhurst House, Wheatley House and Hurstbourne House (Four Buildings)

13.237 A total of 440 rooms were assessed for sunlight within these four buildings.

13.238 417 (95%) of the 440 rooms assessed would meet BRE criteria for both total and winter PSH, which is therefore considered to equate to a negligible effect.

13.239 Of the affected rooms for winter PSH, two would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining 13 rooms would experience an alteration in excess of 40% which is considered a major adverse effect.

13.240 For total APSH, seven rooms would experience alterations between 20-29.9% which is considered a minor adverse effect, and six would experience an alteration between 30-39.9% which is considered a moderate adverse effect. The remaining 10 rooms would experience an alteration in excess of 40% which is considered a major adverse effect.

13.241 Overall, based on professional judgment, the effect to these buildings is considered to be long-term, local, adverse of moderate significance.

195 Roehampton Lane

13.242 A total of six rooms were assessed for sunlight within this building.

13.243 Five of the six rooms assessed would meet BRE criteria for both total and winter PSH, which is therefore considered to equate to a Negligible effect.

13.244 All rooms for winter APSH would meet the BRE criteria and are therefore considered to experience a negligible effect.

13.245 For total APSH, one room would experience alterations between 20-29.9% which is considered a minor adverse effect.

13.246 Overall, based on professional judgment, the effect to these buildings is considered to be long-term, local, adverse of negligible effect.

189 Roehampton Lane

13.247 A total of six rooms were assessed for sunlight within this building.

13.248 Five of the six rooms assessed would meet BRE criteria for both total and winter PSH, which is therefore considered to equate to a negligible effect.

13.249 All rooms for winter APSH would meet the BRE criteria and are therefore considered to experience a negligible effect.

13.250 For total APSH, one room would experience alterations between 30-39.9% which is considered a moderate adverse effect.

13.251 Overall, based on professional judgment, the effect to these buildings is considered to be long-term, local, adverse of minor significance.

193 Roehampton Lane

13.252 A total of five rooms were assessed for sunlight within this building.

13.253 Four of the five rooms assessed would meet BRE criteria for both total and winter PSH, which is therefore considered to equate to a negligible effect.

13.254 Of the affected room for winter PSH, one would experience an alteration excess of 40% which is considered a major adverse effect.

13.255 For total APSH, one room would experience alterations in excess of 40% which is considered a major adverse effect.

13.256 Overall, based on professional judgment, the effect to these buildings is considered to be long-term, local, adverse of moderate significance.

Overshadowing

13.257 Full details of the Transient Overshadowing assessment can be found within Appendix 13.3 and the results are summarised below.

13.258 The commentary below should be read in conjunction with the Transient Overshadowing images presented within the full assessment provided in Appendix 13.3.

13.259 The Transient Overshadowing assessment has been used to identify any area of public private amenity which may be significantly affected by the Development.

21 March

Transient Overshadowing

13.260 On March 21st all but one of amenity areas assessed would experience no overshadowing for more than an hour and are therefore considered to experience a negligible effect. The only amenity area that would experience more than an hour of shadow cast by the proposed development is Alton Estate green, that is discussed in more detail below.

13.261 Alton Estate green, would experience overshadowing on a very small section to the east of the green for approximately four hours. It should be noted that the vast majority of the Alton Estate green will be in direct sunlight throughout the day. The Alton Estate green is therefore

considered to experience a negligible effect.

13.262 In addition, the Alton Activity Centre playground on Ellisfield Drive would experience additional overshadowing on part of its areas between 08:00GMT and 10:00GMT. However, it is important to note that, from 10:00GMT onwards, only the small southern section of the Alton Activity Centre would experience overshadowing. The Area would however receive direct sunlight on the vast majority of its area from 10:00GMT till sunset. It should be noted that the activity centre is not connected to a school, and therefore it is unlikely that children would be using the amenity area before 10:00GMT. Therefore, the Alton Activity Centre is considered to experience a negligible effect due to the availability of direct sunlight on the area for eight hours of the day.

13.263 The private gardens associated with 2-10 Rodway Road and the rear gardens of 2-24 Rodway Road would not be affected by the Development and are considered to experience a negligible effect.

13.264 Overall, on March 21st, as all amenity areas would experience considerably more than 2 hours of direct sunlight on more that 50% of their area, the effect from overshadowing is considered negligible.

21 June

Transient Overshadowing

13.265 On June 21st with the exception of two amenity areas discussed below, all amenity areas assessed would experience no overshadowing for more than an hour and are therefore considered to experience a negligible effect. The two amenity areas that are affected by the Development for more than an hour throughout the day, are discussed below.

13.266 Alton Estate green, would experience overshadowing on a very small section to the south and east of the green for approximately four hours. It should be noted that as on March 21st, the vast majority of the Alton Estate green will be in direct sunlight throughout the day. The Alton Estate green is therefore considered to experience a negligible effect due to the small increase in shadow cause to the east of the green.

13.267 In addition, the Alton Activity Centre playground on Ellisfield Drive would experience overshadowing for four hours between 06:00BST and 10:00BST. However, it is important to note that, from 10:00BST onwards, the Alton Activity Centre would experience direct sunlight on the vast majority of its area. As the activity centre is not connected to a school, it is

unlikely that children would be using the amenity area before 10:00BST. From 10am till approximately 18:00BST and they would still be in school. Therefore, the Alton Activity Centre is considered to experience a negligible effect due to the availability of direct sunlight on the area for eight hours of the day.

13.268 The private gardens associated with 2-10 Rodway Road and the rear gardens of 2-24 Rodway Road would not be affected by the Development and are considered to experience a negligible effect.

13.269 Overall, on March 21st, as all amenity areas would experience considerably more than 2 hours of direct sunlight on more that 50% of their area, the effect from overshadowing is considered negligible.

21 December

Transient Overshadowing

13.270 On December 21st the majority of amenity areas would experience no overshadowing for more than an hour and are therefore considered to experience a negligible effect, with the exception of the three amenity areas discussed below.

13.271 Alton Estate green, would experience overshadowing on a small section of the green between 9:00GMT and 11:00GMT. It should be noted that the vast majority of the Alton Estate green will be in direct sunlight throughout the day. The Alton Estate green is therefore considered to experience a negligible effect.

13.272 The Alton Activity Centre playground on Ellisfield Drive would experience overshadowing between for the majority of the day as a result of the long shadows from the low angle of the sun in winter. However, it is important to note that, there is marginal additional overshadowing caused by the Development between 11:00GMT 12:00GMT and less overall overshadowing between 14:00GMT and sunset. Therefore, as the shadow on the Alton Activity Centre on December 21st are cause by predominantly by existing buildings and not the Development, the effect to the Alton is considered to experience a negligible effect.

13.273 The private gardens associated with 2-10 Rodway Road would experience overshadowing on their rear gardens from to 12:00-14:00GMT. From 14:00-16:00GMT, the rear gardens of 2-24 Rodway Road would be cast under shadow. It should be noted that the majority of shadow is also cast existing shadow. Therefore, the additional shadow caused by the Development are unlikely to be noticeable and these private gardens are considered to experience a negligible

effect.

13.274 Overall, on December 21st, the effect from overshadowing is considered negligible.

Light Pollution

13.275 The light pollution assessment can be found in Appendix 13.5 and are discussed in detail below.

13.276 It is important to note that this light pollution assessment does not assess the effect on existing receptors due to their distance of greater than 20m from the Development, but only on residential elements within the Site.

Light Intrusion

13.277 The most sensitive receptors for light intrusion are considered to be residential elements within the Site. No receptors external to the Site have been assessed due to their distance of more that 20m from the Development.

13.278 The results of the assessment indicate that pre-curfew (before 11pm), the levels of light trespass would be very limited and well within the 10 lux level suggested by the ILP for a Zone E3 location for the residential buildings assessed.

13.279 The assessment also indicates that post-curfew (after 11pm), the levels of light trespass would be well below the 2 lux level suggested by the ILP for a Zone E3 location for the property assessed. As such, the effect of light pollution for all sensitive receptors assessed (pre and post curfew) is considered negligible.

Mitigation Measures

Construction Phase

13.280 Given that any effects are not anticipated to be worse during the demolition and construction period than when the buildings are completed, no additional mitigation measures are required.

Operational Phase

Daylight and Sunlight

13.281 Owing to the scale of the Development in comparison to the existing buildings and Site arrangements, changes in daylight and sunlight conditions would be unavoidable.

13.282 Mitigation measures were incorporated in the design of the Development, by way of massing cutbacks. As such, no additional mitigation measures can be delivered to reduce the scale of adverse effects once the Development is complete and operational.

Overshadowing

13.283 No additional mitigation measures are required or proposed.

Light Pollution

13.284 No additional mitigation measures are needed to reduce the scale of adverse effects as no effects are reported.

Residual Effects

13.285 As mitigation measures were incorporated within the design of the Development, no additional mitigation measures are proposed. The residual effects would remain as discussed in the significant effect section.

Summary

13.286 Table 13.7 contains a summary of the likely significant effects of the Development.

Table 13.7 Table of Significance – Daylight, Sunlight, Overshadowing & Light Pollution

Potential Effect	**Nature of Effect** (Permanent/Temporary)	**Significance** (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)	**Mitigation / Enhancement Measures**	**Geographical Importance***							**Residual Effects** (Major/Moderate/Minor) (Beneficial/Adverse/Negligible)
				I	UK	E	R	C	B	L	
Construction											
Surrounding sensitive receptors	Temporary	As Per Completed Development	None Proposed							*	As Per Completed Development
Surrounding sensitive amenity areas	Temporary	As Per Completed Development								*	
Completed Development											
Daylight to Surrounding sensitive receptors	Permanent	Negligible to 20 properties, Minor Adverse to 7 Properties, Moderate Adverse to 4 properties and Major Adverse to 1 property	No additional mitigation proposed Adjustments were made to the massing at the design stage to reduce daylight losses							*	Negligible to 20 properties, Minor Adverse to 7 Properties, Moderate Adverse to 4 properties and Major Adverse to 1 property
Sunlight to surrounding sensitive receptors	Permanent	Negligible to 21 properties, Minor Adverse to 1 property and Moderate Adverse to 5 properties	No additional mitigation proposed Adjustments were made to the massing at the design stage to reduce sunlight losses							*	Negligible to 21 properties, Minor Adverse to 1 property and Moderate Adverse to 5 properties
Overshadowing to Surrounding sensitive amenity areas	Permanent	Negligible	No additional mitigation proposed Adjustments were made to the massing at the design stage to reduce overshadowing							*	Negligible
Light pollution to surrounding sensitive receptors	Permanent	Negligible	None Proposed							*	Negligible

*** Geographical Level of Importance**

I = International; UK = United Kingdom; E = England; R = Regional; C = County; B = Borough; L = Local

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Alton Estate, Roehampton

Environmental Statement Volume 1
Chapter 14 Summary & Residual Effects

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14. SUMMARY AND RESIDUAL EFFECTS

Introduction

14.1 This chapter summarises the mitigation measures and residual effects identified in each of the technical assessments included in the ES, which has been prepared to accompany a hybrid planning application for demolition of existing buildings and erection of up to 1,103 dwellings, new and replacement community facilities, flexible commercial floorspace, new and replacement play facilities and associated hard and soft landscaping, public realm and access improvements, parking, servicing, and other associated works at part of the Alton Estates, Roehampton.

14.2 The Development has been subject to an iterative design process. As this process progressed measures have been incorporated into the Development in order to avoid, reduce or offset significant environmental effects. Where this has not been possible, further mitigation measures have been proposed and are set out in Table 14.1 below along with the residual effects of the Development following mitigation.

Table 14.1: Significance Table

Stage	Effect	Mitigation	Residual Significance
Population and Human Health			
Construction	Effects on Employment	None Required	Major Beneficial
Completed Development	Effects on Population and Housing	None Required	Moderate Beneficial
	Effects on Local Expenditure		Major Beneficial
	Effects on Employment		Moderate Beneficial
	Effects on Primary Healthcare		Moderate Beneficial
	Effects on Wider Human Health	No mitigation required as all measures designed into the detail of the Development	Moderate Beneficial
	Effects on Education	None Required	Negligible
	Effects on Deprivation		Moderate Beneficial
	Effects on Open Space		Major to Moderate Beneficial
Heritage, Townscape and Visual Effects			
Construction	Heritage Assets	Protection of vegetation; locating compounds and stockpiles in least sensitive locations; limiting movements; controlling lighting and working hours; providing hoardings; minimising duration of tall plant and machinery on Site.	Minor Adverse to Negligible
	Townscape Character		Moderate Adverse to Neutral
	Visual Receptors		Moderate Adverse to Negligible
Completed Development	Heritage Assets	Enhancement of vegetation within Site, with advanced	Minor Beneficial to Minor Adverse

Stage	Effect	Mitigation	Residual Significance
	Townscape Character	planting where practicable; ongoing management and maintenance of hard and soft landscaping measures; and applying the Design Codes to the 'outline elements'.	Moderate Beneficial to Neutral
	Visual Receptors		Moderate Beneficial to Neutral
Archaeology			
Construction	Change to most or all key archaeological materials, such that the resource is totally altered.	Excavation and recording (preservation by record), public dissemination of archaeological data	Moderate to Minor Beneficial
	Changes to many key archaeological materials, such that the resource is clearly modified		Moderate to Minor Beneficial
	Changes to key archaeological materials, such that the asset is slightly altered		Moderate to Minor Beneficial
Completed Development	n/a	n/a	n/a
Transport and Access			
Construction	Driver & Bus Delay	Construction Logistics Plan	Moderate to Minor Adverse
	Pedestrian & Cyclist Delay		Negligible
Completed Development	Driver & Bus Delay	S106 bus service enhancement contribution if required; Travel Plan; Delivery and Servicing Management Plan	Negligible
	Pedestrian Amenity, Fear & Intimidation	Travel Plan; Delivery and Servicing Management Plan	Moderate Beneficial
Air Quality			
Construction	Dust deposition and elevated PM_{10} concentrations	Standard high-risk mitigation measures from the SPG on 'the control of dust and emissions during construction and demolition' to be applied.	Not significant in relation to proposed and existing human health receptors and ecological receptors.
	Elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations from construction traffic	No direct mitigation required.	Not significant in relation to existing human health receptor and ecological receptors.
Completed Development	Elevated NO_2, PM_{10} and $PM_{2.5}$ concentrations from operational traffic and relocation of the bus turnaround	No direct mitigation required.	Not significant in relation to proposed and existing human health receptor and ecological receptors.
Noise and Vibration			
Construction	Construction Noise	Procedures within the CEMP, including: • operate within approved construction hours; • no plant/equipment to be operational at night; and	Minor Adverse
	Construction Traffic		Negligible
	Construction Vibration		Negligible

Stage	Effect	Mitigation	Residual Significance
		• Equipment switched off when not in use.	
Completed Development	Fixed Plant Noise	Mechanical plant designed (in terms of noise source output) accordingly to the requirements of LBW	Negligible
	Road Traffic Noise	None Required	Negligible
	Relocation of Bus Turnaround		Negligible
Biodiversity			
Construction	Richmond Park SAC, SSSI, NNR, SMINC and Wimbledon Common SAC, SSSI, SMINC	N/A	No Effect
	Barnes Common LNR, SMINC and Sites of Importance for Nature Conservation (SBINCs and SLINC)		No Effect
	Habitats	Regeneration avoids Downshire Fields; Habitat Creation and Enhancement of Public Realm and Open Space areas; adherence with CEMP.	Moderate Adverse
	Bats - Roosting	Buildings with bat potential that are to be demolished and trees that are to be removed as part of the Development should be re-surveyed and appropriate mitigation/licensing to be implemented as required. A minimum of 18 bat boxes will be installed during the initial phase of the Development.	Negligible
	Bats- Commuting and Foraging	Night working to be avoided. Construction lighting will be kept at low-level, pointing away from tree-lines and fitted with back guards to prevent light spill into bat foraging habitat.	Negligible
	Birds – Incidental mortality	Removal of vegetation that may contain nests is to be carried out outside of the nesting season. Any removal of vegetation that may contain nests is to be carried out outside of the nesting season	Negligible
	Birds – Disturbance	Provision of suitable nesting habitats (20No. bird boxes) prior to clearance and demolition away from construction areas.	Negligible
	Invertebrates	N/A Log piles have been incorporated into the landscape design. Specific	No Effect

Stage	Effect	Mitigation	Residual Significance
		stag beetle 'loggeries' will be provided in areas which remain undisturbed. Loggeries should be created using timbers buried vertically.	
Completed Development	Richmond Park SAC, SSSI, NNR and Wimbledon Common SAC, SSSI	N/A	No Effect
	Barnes Common LNR, SMINC and Sites of Importance for Nature Conservation (SBINCs and SLINC)		No Effect
	Habitats	Maturation and establishment of planting and landscape plan. Implementation of a Management Plan to ensure the landscape planting and strategy is delivered and successfully fulfils conservation objectives for the Site.	Minor Beneficial
	Bats- Commuting and Foraging	Sensitive lighting plans.	Minor Beneficial
	Birds	N/A	No Effect
	Invertebrates	Implementation of meadow management in line with the proposed landscape planting and habitat enhancement works to ensure potential impacts to invertebrate species are minimised. Log piles have been incorporated into the landscape design. Specific stag beetle 'loggeries' will be provided in areas which remain undisturbed.	Minor Beneficial
Daylight, Sunlight, Overshadowing and Light Pollution			
Construction	Surrounding sensitive receptors	None Proposed.	As Per Completed Development
	Surrounding sensitive amenity areas		
Completed Development	Daylight to Surrounding sensitive receptors	No additional mitigation proposed. Adjustments were made to the massing at the design stage to reduce daylight losses.	Negligible to 20 properties, Minor Adverse to 7 Properties, Moderate Adverse to 4 properties and Major Adverse to 1 property
	Sunlight to surrounding sensitive receptors	No additional mitigation proposed. Adjustments were made to the massing at the design stage to reduce sunlight losses.	Negligible to 21 properties, Minor Adverse to 1 property and Moderate Adverse to 5 properties

Stage	Effect	Mitigation	Residual Significance
	Overshadowing to Surrounding sensitive amenity areas	No additional mitigation proposed. Adjustments were made to the massing at the design stage to reduce overshadowing.	Negligible
	Light pollution to surrounding sensitive receptors	None Proposed.	Negligible

Interactive Effects

14.3 Regulation 4 (2) states that an ES must include a description of the aspects of the environment likely to be significantly affected by the Development and the interrelationship between these effects. There is no published methodology for determining the significance of interactive or synergistic effects. Combining effects with respect to one environmental discipline with another has to be qualitative and is necessarily based on judgment. Therefore, a matrix system has been used to indicate where such effects would likely occur for the construction and operational phases. This has been informed by the residual effects of the Development (as identified above in Table 14.1) and are those effects where greater than negligible effects have been identified, where they relate to a common receptor. The findings of this exercise are set out in Table 14.2 below.

Table 14.2 Interactive Effects

Effect	Local Population	Users of the Local Road Network	Ecology
Construction Phase			
Views of vehicles and machinery being used during the demolition and construction period	*	*	*
Disruption to users of the local road network	*	*	
Demolition and Construction Noise (plant and machinery)	*		*
Employment opportunities and increased spending in the local supply chain	*		
Operational Phase			
Views of the Development	*		

Effect	Local Population	Users of the Local Road Network	Ecology
New Habitat Creation			*
New housing, healthcare provision and opportunities for employment	*		
Wider Human Health, local open space and deprivation	*		

*indicates where an effect may occur.

14.4 The proposed demolition and construction works, are considered most likely to give rise to potential interactive effects, given the scale of the Development and its urban context. During the demolition and construction phase it is considered that interactions could potentially occur between noise and vibration effects, air quality effects, transport effects and visual effects. Individually these effects are expected to range from negligible to moderate adverse at worst (as set out in Table 14.1 above). It is therefore considered that the interactive effects during demolition and construction on the surrounding area would also range from negligible to moderate adverse at worst. Any moderate adverse effects would be temporary in duration and are likely to be associated only with the peak periods of demolition and construction activity.

14.5 Appropriate mitigation during the demolition and construction phase has been identified in the ES as necessary, such as the erection of protective hoardings around the Site, and best practice measures to reduce or eliminate potential adverse environmental effects of demolition and construction as far as possible. Furthermore, the Demolition and Construction Chapter (see Chapter 5) proposes a programme which will ensure that the Development would be implemented in the most efficient manner. This would include measures to be set out and secured through the implementation of a Construction Environmental Management Plan (CEMP) for the Development (see Chapter 5 for further details). Relevant legislative requirements would also need to be adhered to.

14.6 During the operational phase it is considered that interactions could potentially occur in terms of townscape and Visual effects, as well as effects in relation to Biodiversity and Population and Human Health. Individually these effects are expected to range from negligible to major beneficial (as set out in Table 14.1 above). It is therefore considered that the interactive effects during operation of the Development on the surrounding area would also range from negligible to major beneficial.

Conclusions

14.7 The Development will result in the following beneficial residual effects:

- Benefits to the local economy, through increase spending from the new population and from employment generation during both the construction and operation period of the Development;
- Increase in housing provision in the area;
- Benefits to primary healthcare opportunities;
- Beneficial effects in terms of Wider Human Health, local open space and deprivation;
- Beneficial effects from the completed development on Townscape Character and Visual Receptors;
- Excavation and recording of any archaeological materials found on the Site;
- Beneficial transport effects during construction on driver and bus delay and operation in terms of pedestrian amenity, fear and intimidation; and
- Provision of new habitats on the Site and opportunities for nature.

14.8 The ES has also identified a number of residual adverse effects, including:

- Effects on heritage assets, townscape character and visual receptors during construction of the Development;
- Some transport related effects (driver and bus delay) during construction of the Development;
- Some loss of existing habitats, albeit new habitats would be provided, as noted above;
- Noise generated during the construction phase from vehicles and construction plant and machinery; and
- Some impact on daylight and sunlight provision to surrounding properties.