EBURY BRIDGE RENEWAL

HYBRID PLANNING APPLICATION
ENVIRONMENTAL STATEMENT
VOLUME I

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Abbreviations and Glossary

Abbreviation	Definition
µg	micro gram
AADT	Annual Average Daily Traffic
ACCM	Atkins Carbon Critical Masterplanning
ACM	Asbestos containing materials
ADMS	Atmospheric Dispersion Modelling System
AOD	Above Ordnance Datum
APSH	Annual Probable Sunlight Hours
AQAP	Air Quality Action Plan
AQFA	Air Quality Focus Areas
AQMA	Air Quality Management Areas
AQN	Air Quality Neutral
AQO	Air Quality Objective
ASR	Annual Status Report (air quality)
BAME	Black, Asian and Minority Ethnic
BAP	Biodiversity Action Plan
BEB	Building Emission Benchmark
BEIS	Department for Business Energy and Industry Strategy
BGS	British Geological Survey
BNL	Basic Noise Level
BPM	best practicable means
BRE	Building Research Establishment
BS	British Standards
CAR	Control of Asbestos Regulations
CAZ	Clean Air Zone (London)
CCG	Clinical Commissioning Group
CDM	Construction (Design and Management) Regulations
CHP	Combined Heat and Power
CIEEM	Chartered Institute for Ecology and Environmental Management
CiFA	Chartered Institutes for Archaeologists
CIRIA	Construction Industry Research and Information Association
CLP	Construction Logistics Plan
CMP	Construction Management Plan
COA	Census Output Area
CoCP	Code of Construction Practice
CoPA	Control of Pollution Act
CPTED	Crime Prevention Through Environmental Design
CRTN	Calculation of Road Traffic Noise
CSM	Conceptual site model

Abbreviation	Definition
CTRN	Calculation of Road Traffic Noise
DAS	Design and Access Statement
dB	Decibels
DBA	Desk-Based Assessment
DEFRA	Department for Environment, Food and Rural Affairs
DEMP	Demolition Environmental Management Plan
DM	Do minimum
DMP	Demolition Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do something
EA	Environment Agency
EC	European Commission
EFT	Emissions Factor Toolkit (DEFRA)
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EMI	Electromagnetic Interference
EMP	Environmental Management Plan
EPSM	European Protected Species Mitigation
EPUK	Environmental Protection United Kingdom
ES	Environmental Statement
EU	European Union
FRA	Flood Risk Assessment
FTE	Full-Time Equivalent
FWRA	Foundations Work Risk Assessment
GEA	Gross External Area
GFA	Gross Floor Area – the total floor area of a building, which includes external walls and internal floor area.
GHG	Greenhouse Gas
GiGL	Greenspace Information for Greater London
GLA	Greater London Authority
GLAAS	Greater London Archaeological Advisory Service
GLHER	Greater London Historic Environment Record
GWP	Global Warming Potential
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
HUDU	Healthy Urban Development Unit
IAQM	Institute of Air Quality Management

Abbreviation	Definition
ICCI	In-combination Climate Change Impacts
IDP	Infrastructure Delivery Plan
IEMA	Institute of Environmental Management and Assessment
IMD	Index of Multiple Deprivation
IPTV	Internet Protocol Television
JSNA	Joint Strategic Needs
kph	Kilometres per hour
LAEI	London Atmospheric Emission Inventory
LAQM PG	Local Air Quality Management Policy Guidance
LAQM TG	Local Air Quality Management Technical Guidance
LBL	London Borough of Lambeth
LBW	London Borough of Wandsworth
LDDC	London Docklands Development Corporation
LDV	Light Duty Vehicle
LES	London Environment Strategy
LLAQM TG	London Local Air Quality Management Technical Guidance
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LPA	Local Planning Authority
LSOA	Lower Super Output Area
m	Metres
MUGA	Multi-use Games Area
NAPL	Non aqueous phase liquid
NAQS	National Air Quality Strategy
NHS	National Health Service
NO_2	Nitrogen dioxide
NOEL	No Observed Effect Level
NOx	Nitrogen oxides (generic)
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NRMM	Non-Road Mobile Machinery
NSL	No Sky Line
NTS	Non-Technical Summary
ONS	Office for National Statistics
OS	Ordnance Survey
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated biphenyls
PCLs	Plausible potential contaminant linkages
PEA	Preliminary Ecological Appraisal
PEA	Preliminary Ecological Appraisal
PM_{10}/ $PM_{2.5}$	Particulate Matter

Abbreviation	Definition
PPC	Pollution Prevention and Control
PPE	Personal Protective Equipment
PPG	Planning Practice Guidelines
PPG-N	Planning Practice Guidance for noise
PPL	Plausible Pollutant Linkages
PPV	Peak Particle Velocity
PRA	Preliminary Risk Assessment
PRF	Potential roosting features
PTAL	Public Transport Access Level
PV	Photovoltaic
RBKC	Royal Borough of Kensington & Chelsea
RICS	Royal Institution of Chartered Surveyors
SOAEL	Significant Observed Adverse Effect Level
SPG	Supplementary Planning Guidance
SPZ	Source Protection Zone
SuDS	Sustainable Drainage Systems
SVOC	Semi-volatile organic compounds
SWMP	Site Waste Management Plans
TA	Transport Assessment
TBE	Total Building Emissions
tCO_2e	Tonnes of carbon dioxide equivalent
TEB	Transport Emission Benchmark
TfL	Transport for London
TPH	Total Petroleum Hydrocarbons
TTE	Total Transport Emissions
UAEL	Unacceptable Adverse Effect Level
UDP	Unitary Development Plan (Westminster)
UGF	Urban Greening Factor
UKCP18	United Kingdom Climate Projections 2018
ULEZ	Ultra-Low Emission Zone
USA	Updating and Screening Assessment
UXO	Unexploded Ordnance
VDV	Vibration dose value
VOCs	Volatile Organic Compounds
VSC	Vertical Sky Component
WCC	Westminster City Council
WCC LPA	Westminster City Council Local Planning Authority
WHO	World Health Organisation
WSI	Written Scheme of Investigation
WYG	White Young Green

Glossary Term	Definition
µg/m^3	Micro grams per meter cubed.
Air Quality Management Area (AQMA)	An area within a local authority boundary where the air quality objectives are not likely to be achieved. The local authority is required to declare the area as an AQMA to prepare a local air quality action plan.
Air Quality Neutral (AQN) Assessment	AQN Assessment is used to ensure that the cumulative impact from a large number of developments, which may individually have a small impact on air quality, does not lead to an incremental increase in background concentrations.
Annual Average Daily Traffic (AADT)	The number of vehicles that will drive on a stretch of road on an average day of the year
Annual Exceedance Probability (AEP)	The probability that a flood event will occur in any year.
Annual Status Report (ASR)	Annual report prepared by local authorities to report on progress in achieving reductions in concentrations of emissions relating to relevant pollutants below air quality objective levels. It is also where local authorities identify new or changing sources of emissions.
Applicant	Westminster City Council
Aquifer	An underground layer of water-bearing permeable rock, rock fractures or unconsolidated materials (gravel, sand, or silt).
Arup	Ove Arup and Partners Ltd
Assessment area	Defined area surrounding the site in which data has been collected
Atmospheric Dispersion Modelling System (ADMS)	An air quality dispersion modelling software package.
Baseline	Data used to describe existing environmental conditions
British Standard 15804	This standard outlines the requirement for quantifying and reporting emissions at a construction product and construction service level.
British Standard ES 15978:2011	This standard outlines the calculation method to assess performance at the buildings level, based on lifecycle assessment (LCA).
Carbon budget	A carbon budget refers to the restriction on the total amount of greenhouse gases the UK can emit over a 5-year period. The UK is the first country to set legally binding carbon budgets.
Carbon dioxide (CO_2)	Carbon dioxide refers to a heavy colourless and odourless gas that is produced as a result of the combustion of carbon and organic compounds, and through respiration.
Code of Construction Practice (CoCP)	A document that details measures and standards to which a developer or contractor must adhere in order to provide effective planning, management and control of potential impacts on individuals, communities and environment during construction.
Consented Scheme	A development that has been granted planning permission
Conservation area	An area of notable environmental or historical interest or importance which is protected by law against undesirable changes
Cumulative effects	Effects on the environment resulting from the accumulation of individual effects and incremental changes caused by other past, present or reasonable foreseeable actions together with the development.
Db (A)	The unit used to define a weighted sound pressure level, which correlates well with the subjective response to sound. The 'A' weighting follows the frequency response of the human ear, which is less sensitive to low and very high frequencies than it is to those in the range 500Hz to 4kHz. In some statistical descriptors the 'A' weighting forms part of a subscript, such as LA10, LA90, and LAeq for the 'A' weighted equivalent continuous noise level.
dBLA	The unit used to define a weighted sound level, which correlates well with the subjective response to sound. The 'A' weighting follows the frequency response of the human ear, which is less sensitive to low and very high frequencies than it is to those in the range 500Hz to 4kHz.
Decibel (dB)	The ratio of sound pressures which humans can hear is a ratio of 106:1 (one million: one). For convenience, therefore, a logarithmic measurement scale is used. The resulting parameter is called the 'sound pressure level' (Lp)

Glossary Term	Definition
	and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.
Detailed Area	The area covered by the detailed planning consent for Blocks 7 and 8 comprising: residential floorspace and ancillary residential facilities (Class C3); provision of a basement; new pedestrian and vehicular access; and associated amenity space landscaping, car and cycle parking, refuse storage, servicing area, and other associated infrastructure works.
Ebury Bridge Estate Masterplan	The Detailed Area and Outline Area combined, covering the entire Proposed Development.
EIA Regulations	The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended
EIA Regulations	The Town and Country Planning (Environmental Impact Assessment) Regulations 2017
Embodied Carbon	This refers to the carbon footprint of the production of a material, considering Greenhouse Gas emissions throughout the supply chain. Typically, embodied carbon is measured from 'cradle to grave' – from the initial obtaining of the material to its end of life decommissioning.
Emissions Factor Toolkit (EFT)	A tool published by Defra that assists local authorities to carry out Review and Assessment of local air quality.
Equivalent continuous sound level	An index for assessment for overall noise exposure is the equivalent continuous sound level, Leq. This is a notional steady level which would, over a given period of time, deliver the same sound energy as the actual time-varying sound over the same period. Hence fluctuating levels can be described in terms of a single figure level.
ESDU	A documented methodology and computer program used to estimate the topographic effects on wind speeds as they approach a site. This is used to 'translate' wind speeds measured at an airport or meteorological station to the target site. (https://www.esdu.com/cgi-bin/ps.pl?sess=unlicensed_1200422114217xsj&t=doc&p=esdu_84011d-r1)
European Landscape Convention (ECL)	The first international treaty dedicated to the protection, management and planning of all landscapes in Europe.
Frequency	Frequency is the rate of repetition of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the hertz (Hz), which is identical to cycles per second. A 1000Hz is often denoted as 1kHz, eg 2kHz = 2000Hz. Human hearing ranges approximately from 20Hz to 20kHz. For design purposes the octave bands between 63Hz to 8kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it. For more detailed analysis, each octave band may be split into three one-third octave bands or in some cases, narrow frequency bands.
GHG Footprint	This refers to the predicted emissions of greenhouse gases for a product, service or event.
Global Warming Potential (GWP)	GWP refers to the relative measure of the quantity of heat that greenhouse gas traps in the atmosphere.
Greater London Historic Environment Record (GLHER)	Archaeological and built heritage database covering Greater London held and maintained by Historic England. Previously known as the Greater London Sites and Monuments Record
Greenhouse Gas (GHG)	According to the Kyoto Protocol, there are seven main GHGs that contribute to climate change. These are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF6) and nitrogen trifluoride (NF3). Greenhouse gases are presented by the universal unit of measurement, CO2e, to indicate the global warming potential (GWP) of GHGs, expressed in terms of the GWP of one unit of carbon dioxide.
Gross Floor Area (GFA)	The total floor area of a building, which includes external walls and internal floor area.
Inventory of Carbon and Energy (ICE)	Developed by the University of Bath's Sustainable Energy Research team, the ICE provides a database for embodied energy and embodied carbon coefficients for building materials.

Glossary Term	Definition
Irwin Propes	A robust, omnidirectional measurement device used to measure both the mean wind speed and lower-frequency fluctuations of pedestrian-level winds in wind tunnel testing. An Irwin probe consists of a sensor tube that projects above the ground to a scaled height of 1.5m. The tube is mounted within a round sensor hole at ground level and the pressure difference between the sensor hole and the top of the sensor tube is used to calculate the wind speed.
Listed buildings	Building of special architectural or historic interest, recorded in the List of Buildings of Special Architectural or Historic Interest compiled according to the provisions of the Planning (Listed Buildings and Conservation Areas) Act 1990. Such buildings are subdivided into Grades I, II* and II (in descending importance)
London Local Air Quality Management (LLAQM)	A London specific LAQM system established by the Mayor of London for the effective and coordinated discharge of the responsibilities of the local authorities in Greater London under Part IV of the Environmental Act 1995
Lowest observed adverse effect level (LOAEL)	This is the level of noise exposure above which adverse effects on health and quality of life can be detected.
Made ground	Areas where material is known to have been placed by man on the pre-existing (natural or artificial) land surface (including engineered fill). Definition provided by British Geological Survey.
Massing	Term used in architecture which refers to the perception of the general shape and form as well as size of a building.
Maximum noise level	The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125ms duration and fast time weighting (F) has an exponential time constant of 125ms which reflects the ear's response. Slow time weighting (S) has an exponential time constant of 1s and is used to allow more accurate estimation of the average sound level on a visual display. The maximum level measured with fast time weighting is denoted as LAmax, F. The maximum level measured with slow time weighting is denoted LAmax, S.
Meanwhile use	The use of vacant land or vacant buildings for a temporary, short-term purpose. This may be vacant land available prior to construction of a new building or development, or temporarily vacant buildings prior to new ownership.
Movement (traffic)	Total flows in both directions
Non-aqueous phase liquid (NAPL)	Liquid contaminants that do not dissolve in or easily mix with water, such as oil, gasoline, or petroleum.
No-observed effect level (NOEL)	This is the level below which no effect can be detected. Below this level, there is no detectable effect on health and quality of life due to the noise.
Obtrusive lighting	A form of pollution determined by the use of electric lighting, which may be a nuisance in law, which can be substantially reduced without detriment to the lighting of a task by using appropriate design rules and equipment.
Ordnance Datum (OD)	A fixed level used by Ordnance Survey as the basis for deriving altitudes on maps.
Outline Area	The area covered by the mixed use development in outline for: residential floorspace and ancillary residential facilities (Class C3) non-residential floorspace comprising flexible retail (Classes A1 – A4), community (Class D1), leisure (Class D2) and workspace (Class B1) floorspace; provision of basement; new pedestrian and vehicular access; and associated amenity space, open space, landscaping, car and cycle parking, refuse storage, servicing area, and other associated infrastructure works; and
Palaeo-environment	An environment at a period in the geological past.
PAS 2080	PAS2080 refers to a guidance document created by the Green Construction Board as the world's first specification for managing whole-life carbon in infrastructure.

Glossary Term	Definition
PM_{10}/ $PM_{2.5}$	Airborne particulate matter passing a sampling inlet with a 50% efficiency cut-off at 10 or 2.5 µm aerodynamic diameter and which transmits particles of below this size
Public Transport Access Level	A scale indicating the connectivity of a site to the surrounding transport network
Public Transport Accessibility Level (PTAL)	Detailed and accurate measure of the accessibility of a point to the public transport network, taking into account walk access time and service availability.
Serious damage	Includes the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration efforts
Significant observed adverse effect level (SOAEL)	This is the level of noise exposure above which significant adverse effects on health and quality of life occur
Sites of Importance for Nature Conservation (SINC)	Designated sites used by local authorities in the UK for sites of substantive local nature conservation and geological value.
Sound power level	The sound power level (Lw) of a source is a measure of the total acoustic power radiated by a source. The sound power level is an intrinsic characteristic of a source (analogous to its volume or mass), which is not affected by the environment within which the source is located.
Sound pressure level	The sound power emitted by a source results in pressure fluctuations in the air, which are heard as sound. The sound pressure level (Lp) is ten times the logarithm of the ratio of the measured sound pressure (detected by a microphone) to the reference level of 2 x 10-5Pa (the threshold of hearing). Thus Lp (dB) = 10 log (P1/Pref)2 where Pref, the lowest pressure detectable by the ear, is 0.00002 pascals (ie 2x10-5 Pa). The threshold of hearing is 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dBLA and a change of 3dB is only just detectable. A change of 10dB is subjectively twice, or half, as loud.
Sound reduction index (R)	The sound reduction index (or transmission loss) of a building element is a measure of the loss of sound through the material, ie its attenuation properties. It is a property of the component, unlike the sound level difference which is affected by the common area between the rooms and the acoustic of the receiving room. The weighted sound reduction index, Rw, is a single figure description of sound reduction index which is defined in BS EN ISO 717-1: 1997. The Rw is calculated from measurements in an acoustic laboratory. Sound insulation ratings derived from site (which are invariably lower than the laboratory figures) are referred to as the R'w ratings.
Special Area of Conservation (SAC)	Sites which are strictly protected under the EC Habitats Directive.
Special Protection Area (SPA)	A designation under the European Union Directive on the Conservation of Wild Birds
Speed up ratios	In environmental wind engineering, a speed up ratio or speed up factor is a ratio between the wind speeds measured at ground level and a single a reference point. The reference point should be above the area of interest in a part of the flow that is uninterrupted by the mixing happening below. This ratio allows the modelled wind speeds to be applied to the full scale wind models.
Statistical noise levels	For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. The L10, the level exceeded for 10% of the time period under consideration, and can be used for the assessment of road traffic noise (note that LAeq is used in BS 8233 for assessing traffic noise). The L90, the level exceeded for 90% of the time, has been adopted to represent the background noise level. The L1, the level exceeded for 1% of the time, is representative of the maximum levels recorded during the sample period. A weighted

Glossary Term	Definition
	statistical noise levels are denoted LA10, dBLA90 etc. The reference time period (T) is normally included, e.g. dBLA10, 5min or dBLA90, 8hr.
Structure borne noise	This is the transmission of noise energy as vibration of building elements. The energy may then be re-radiated as airborne noise. Structure borne noise is controlled by structural discontinuities, i.e. expansion joints and floating floors.
Susceptibility	In the context of landscape or townscape character, this is the ability of a landscape to accommodate change without undue consequence to character e.g. without compromising current baseline or the realisation of relevant landscape/townscape planning policies or strategies.
Trip End Model Presentation Program (TEMPRO)	TEMPRO is designed to allow detailed analysis of a pre-processed planning data from the National Trip End Model.
United Kingdom Climate Projections 2009 (UKCP09)	UKCP09 was developed to help understand and prepare for climate change.
United Kingdom Climate Projections 2018 (UKCP18)	UKCP18 was developed to help understand and prepare for climate change.
Vertical Skylight Component	Ratio of that part of illuminance at a point on a given vertical plane that is received directly from a standard overcast sky to the illuminance on a horizontal plane due to an unobstructed hemisphere of this sky.
Very High Frequency (VHF)	VHR is the ITU designation for the range of radio frequency waves from 30 to 300 mega-hertz.
Wind tunnel testing	Tool used in aerodynamic research to study the effects of air moving past solid objects.

1 Introduction

1.1 Background

1.1.1 This Environmental Statement (ES) has been prepared by Ove Arup and Partners Ltd. ('Arup') on behalf of Westminster City Council's regeneration team (the 'Applicant') on behalf of Westminster City Council's regeneration team (the 'Applicant') in support of a Hybrid Outline Application for the renewal of the Ebury Bridge Estate, Ebury Bridge Road, London, SW1W 8PX ('the Site'). The Site falls within the administrative area of Westminster City Council ('WCC') and therefore the WCC Local Planning Authority ('WCC LPA') will determine the planning application.

1.1.2 Westminster City Council believes in building a City for All, where everybody can have a place they are proud to call home and as a result have embarked on an ambitious affordable housing programme. Key to this programme is the vision for the Ebury Bridge Renewal which is to set a new standard in estate regeneration. In partnership with Ebury Bridge residents, Westminster City Council is taking forward a scheme that seeks the comprehensive redevelopment of the existing estate. The scheme aims to create a vibrant, modern neighbourhood for both the existing community and new residents by:

- Delivering more affordable housing;
- Creating a sustainable mixed community;
- Delivering improved public spaces and community facilities;
- Partnering with residents and businesses in a meaningful and transparent way to put forward the best proposal for the Ebury Bridge Estate; and
- Setting the standard for estate renewal with high quality design throughout all tenure types.

1.1.3 Extensive consultation and engagement with a wide range of consultees, local stakeholders and residents to inform the proposals has been undertaken. Details on consultation and engagement are set out in the Statement of Community Involvement ('SCI').

The Proposal

1.1.4 The Hybrid Outline Planning Application proposes:

- A mixed use development in outline for residential floorspace and ancillary residential facilities (Class C3) non-residential floorspace comprising flexible retail (Classes A1 – A4), community (Class D1), leisure (Class D2) and workspace (Class B1) floorspace; provision of basement; new pedestrian and vehicular access; and associated amenity space, open space, plant, landscaping, car and cycle parking, refuse storage, servicing area, and other associated infrastructure works; and
- Detailed planning consent for Blocks 7 and 8 comprising residential floorspace and ancillary residential facilities (Class C3); provision of a basement; new pedestrian and vehicular access; and associated amenity space

landscaping, car and cycle parking, refuse storage, servicing area, and other associated infrastructure works.

1.1.5 As part of this proposal the outline element ('the Outline Area') would comprise up to 36,610sqm residential floorspace (equating to an illustrative 532 residential units); and up to 3,018sqm non-residential floorspace. It is being submitted with all matters reserved. This approach has been adopted to establish the principle and character of the wider Site's redevelopment – whilst allowing the necessary flexibility for blocks to be designed and constructed in the future with due consideration to changing context.

1.1.6 Within the Detailed Area 226 residential units are proposed across Blocks 7 and 8, which comprise two buildings up to 18 storeys and 17 storeys in height respectively; with a basement. As a detailed consent, construction of these two blocks can start on Site expediently, ensuring the decant and rehousing of existing residents can occur with minimal upheaval.

1.2 Structure of the Environmental Statement

1.2.1 This ES forms part of the planning application. It has been prepared pursuant to the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, as amended (the 'EIA Regulations'), and with relevant guidance[1].

1.2.2 The ES comprises:

- ES Volume 1: this volume, containing introductory material and the majority of the environmental assessments;
- ES Volume 2: the heritage, townscape and visual impact assessment, and supporting information;
- ES Volume 3: supporting appendices; and
- a standalone Non-Technical Summary (NTS) of the ES.

1.2.3 Section 1 of this volume summarises the construction, demolition, existence and operational effects of the development, and also describes the aggregated interactive effects on single receptors.

1.2.4 Section 2 describes the existing site and surrounding areas including environmental designations such as flood zones and Air Quality Management Areas (AQMA).

1.2.5 A description of the Proposed Development and its construction is given in Section 3. This section also includes the consideration of reasonable alternatives as required by the EIA Regulations.

1.2.6 Section 4 describes the approach and different stages making up the EIA.

1.2.7 Sections 5-15 of this volume present each topic assessment following the approach described in Section 4.

[1] UK Government UK (2017). Guidance – Environmental Impact Assessment. Available at https://www.gov.uk/guidance/environmental-impact-assessment

1.2.8 This ES has been prepared by a team of competent experts. The team comprises technical specialists who have extensive experience in the field of EIA, the details of which are presented in Appendix A1. The individual experts can demonstrate their competence through academic qualifications, membership of relevant professional institutions and practical experience in undertaking EIAs. This ES has been prepared in partnership by experts from:

- Arup;
- Hollis Global (daylight and sunlight assessment); and
- CityDesigner (heritage, townscape and visual impact assessment).

1.2.9 Arup is a registrant of the Institute of Environmental Management and Assessment's EIA Quality Mark scheme. Arup is committed to excellence in EIA activities and has agreed to have this commitment independently reviewed through review of ESs prepared by the company.

1.3 Summary of effects

1.3.1 This section presents a summary of the effects in the vicinity of the site on a receptor-by-receptor basis. This allows the aggregation of these 'interactive effects', set out in Table 1, to be understood.

Table 1: Effects of the Proposed Development grouped by receptor

Receptor	Phase	Topic	Effect	Further Information
Existing and future residents	Construction	Air quality	No significant effects associated with construction activities or construction traffic following the implementation of high risk mitigation included within WCC's Code of Construction Practice (CoCP).	ES Volume 1, Section 5
		Land quality	No significant effects from exposure to contamination on human health following the completion of the ground investigation and subsequent risk assessment and enhanced health and safety measures.	ES Volume 1, Section 13
		Noise and vibration	No significant effects associated with construction traffic noise and construction vibration. Significant adverse effect at nearby residential receptors due to construction noise (at No. 1 Ebury Bridge, Ebury Place, Cheylesmore House, 20-42 Ebury Bridge Road and any remaining residential properties on site during the construction of the Detailed Area). Further measures and real-time noise monitoring will be required.	ES Volume 1, Section 14
		Health	Significant adverse impacts on neighbourhood quality (due to increased construction noise impacting neighbourhood quality) due to disturbance from construction activity. As per the noise assessment, further measures and real-time noise monitoring will be required. No significant effects on accessibility, active travel, community safety and employment.	ES Volume 1, Section 12
	Existence	Daylight and sunlight	The assessment has identified significant adverse effects on 1 Ebury Bridge Road and Cheylesmore House due to shadowing caused by the Proposed Development. Negligible to minor adverse effects, which are not significant, are identified at: the Rising Sun Public House, 20-42 Ebury Bridge Road, Fountain Court, Consort Rise House and Grosvenor Waterside, Moor House.	ES Volume 1, Section 8
	Operation	Air quality	No significant effects on air quality from operational activities, including traffic, are anticipated.	ES Volume 1, Section 5
		Land quality	No significant effects from exposure to ground source gas or vapour sources on human health following the completion of the ground investigation and subsequent risk assessment. Gas and vapour protection in new buildings and landscaping cover layers will be used if required.	ES Volume 1, Section 13
		Noise and vibration	No significant effects from operational noise have been identified.	ES Volume 1, Section 14

Receptor	Phase	Topic	Effect	Further Information
		Health	Significant beneficial effect on crime and community safety due to improved design of the scheme, incorporating passive design features to improve safety. Significant beneficial impacts on social cohesion and inclusive design due to improved community facilities alongside improved designs of homes and public spaces, catering to a wide range of needs.	ES Volume 1, Section 12
		Health and socio-economics	Significant beneficial effect on residents due to a net uplift in residential units and the provision of affordable housing and family units	ES Volume 1, Section 12 and 15
		Socio-economics	A total of 2,854 sqm play space will be provided. This represents a shortfall of 39% compared to the requirements set by the Greater London Authority (GLA). Planning contributions may be required through the planning process, proportionate to the scale and type of the development, in the form of Section 106 contributions, initiatives or programmes. On this basis, the overall effect would reduce from significant adverse to neutral.	ES Volume 1, Section 15
		Socio-economics	Significant beneficial impact on community cohesion due to the provision of new community facilities (such as a community hall) and the creation of a safe and secure state in line with the silver/gold CPTED (Crime Prevention Through Environmental Design) accreditation which would improve community cohesion.	ES Volume 1, Section 15
Local users of the site and surroundings	Existence	Environmental wind	Increased wind speeds north of the development along Ebury Bridge will result in increased wind speeds at the bus stop on Ebury Bridge.	ES Volume 1, Section 11
	Operation		Additional trees have been incorporated into the masterplan at an entrance to Block B1. With this mitigation in place, no significant effects are anticipated during operation of the Proposed Development.	
Employees of existing and future businesses	Existence	Socio-economics	Existing employment floorspace will be required to relocate prior to construction. Longstanding businesses have been offered a right of first refusal for a new unit on the completed estate. Therefore, no significant effects are anticipated.	ES Volume 1, Section 15
	Operation		There will be a beneficial effect on employment, which is not considered significant, due to the net-gain in additional jobs following completion of the Proposed Development.	
	Construction	Climate change	Significant adverse effect associated with increasing GHG emissions within the global atmosphere related to: manufacturing and production of construction materials for	

Receptor	Phase	Topic	Effect	Further Information
Global atmosphere		(greenhouse gas emissions)	buildings, pathways, and roads; transportation of materials to site; transportation of construction workers to site; and construction plant.	ES Volume 1, Section 7
	Operation		Significant adverse effect associated with increasing GHG emissions related to the operational building energy consumption on site and operational traffic emissions.	
Archaeological deposits	Construction	Archaeology	No significant effects from ground disturbance on archaeological deposits following implementation of a mitigation strategy.	ES Volume1, Section 6
	Existence		No significant effects from utility trenching, basement construction and landscaping on archaeological deposits following implementation of a mitigation strategy.	
Heritage assets	Existence	Heritage, Townscape and Visual	No significant effects are identified on Conservation Areas or Registered Parks and Gardens in proximity to the Proposed Development. A low level of harm is anticipated on the non-designated core area of the Pimlico Conservation Area.	ES Volume 2, Heritage, Townscape and Visual
			No significant effects are identified on Listed Buildings in proximity to the Proposed Development, with the exception of the British Airways Terminal (Grade II) which will experience less than substantial harm.	
Visual Receptors	Existence	Heritage, Townscape and Visual	Major beneficial effects are identified from the following views: • St Barnabas Street, corner of Ranelagh Grove • St Barnabas Street Moderate beneficial effects are identified from the following views: • Hugh Street, corner of Hugh Mews (winter) • Sutherland Street, corner of Clarendon Street (winter) • Sutherland Street, corner of Gloucester Street • Grosvenor Road, between the railway and Lupus Street • St Barnabas Street, corner of Ranelagh Grove (night-time) • Pimlico Road • Pimlico Road (winter) A moderate adverse effect is identified from the viewpoint on Westmoreland Place, corner of Lupus Street.	ES Volume 2, Heritage, Townscape and Visual

Receptor	Phase	Topic	Effect	Further Information
Townscape	Existence	Heritage, Townscape and Visual	The majority of Townscape Character Areas assessed will experience moderate to major beneficial effects. No adverse effects are identified.	ES Volume 2, Heritage, Townscape and Visual
Bats	Construction	Ecology	Night-time lighting associated with demolition and construction activities has the potential to disturb bats. However, measures set out in the CMP to comply with best practice will minimise disturbance to roosting, foraging and commuting bats. Therefore, no significant effects are anticipated.	ES Volume 1, Section 9
	Existence		Building demolition and vegetation clearance will impact bat roosting and foraging. The Landscape Strategy sets out a range of new habitats which will provide improved foraging habitats and further survey work is being undertaken to inform a mitigation strategy. Therefore, no significant existence effects on bats are anticipated.	
Scattered trees	Existence	Ecology	Scattered trees across the site will be cleared. However overall there will be a net-gain in the number of trees on site. Therefore, there will be a short-term adverse effect on scattered trees, but a long-term benefit once new trees have been planted and matured.	ES Volume 1, Section 9
		Land quality	No significant effects on plants or trees.	ES Volume 1, Section 13
Controlled waters	Construction	Land quality	No significant effects on controlled waters following the completion of the ground investigation and subsequent risk assessment, design and remediation, and verification.	ES Volume 1, Section 13
	Existence			
	Operation			
Building material and services	Construction	Land quality	No significant effects on building materials and services.	ES Volume 1, Section 13
Satellite and terrestrial TV signals	Existence	EMI	No significant effects on satellite signals. There is a potential for the deterioration of digital terrestrial television. If detected, this may require further mitigation.	ES Volume 1, Section 10

2 Site and surroundings

2.1 The site

2.1.1 Figure 1 shows the location of the Proposed Development. It is located within the City of Westminster at grid reference 528566E 178356N. The site is bounded by Ebury Bridge to the north, the major railway lines to the east leading to Victoria Station, access roads to the south, and Ebury Bridge Road to the west.

2.1.2 London Victoria station is located approximately 700m north-east of the site. A major redevelopment at Chelsea Barracks is located to the south-west, and beyond this is the Royal Hospital Chelsea. Directly to the south, north-west and north of the site are further residential and retail units.

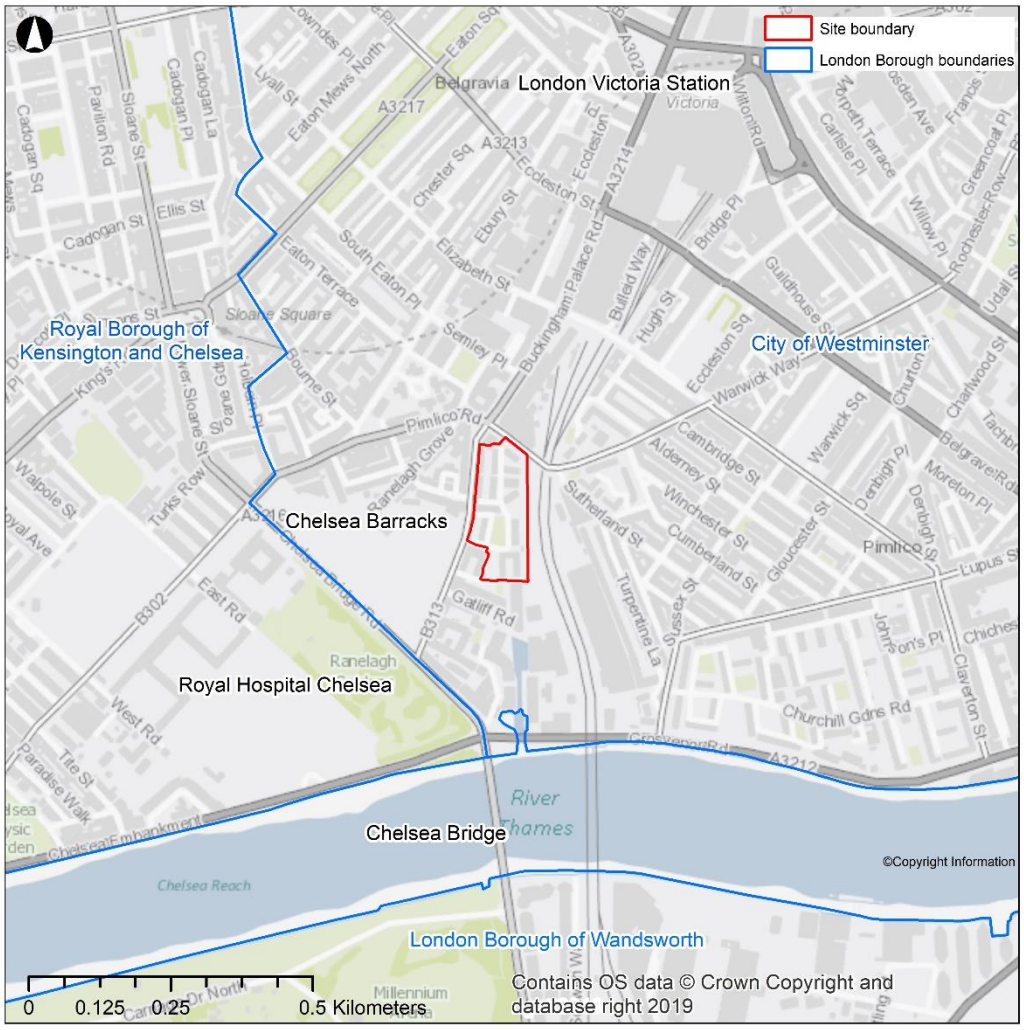


Figure 1: Proposed Development location

2.1.3 The site currently comprises an existing housing estate of 336 residential units, (Figure 2). The existing residential properties are predominantly social housing owned by WCC. The current buildings range from 3-8 storeys in height. There are also currently 14 businesses situated on the estate (in Rye House and Bucknill House).

Figure 2: Existing Ebury Bridge Estate

2.1.4 There is limited parking provision on site. However, the site is well-connected, with a Public Transport Access Level (PTAL) rating of 6b (the highest possible score on the PTAL scale, which indicates an "excellent" connectivity to the surrounding network).

2.1.5 Historically, the site has been occupied by various commercial and industrial land uses, including the former Grosvenor Canal which ran through the east of the site from 1823 until it was backfilled in approximately 1929, and a motorcar works and depot between 1916 to 1958.

2.2 Planning history

2.2.1 The estate renewal process has been a long-term aspiration of WCC. In 2013 plans were submitted to demolish and rebuild blocks along the eastern side of the site and the site of the now demolished Edgson House at the south-west of the site. This was granted planning permission in 2014 but the application was found to be unviable and the permission expired in 2019 (LPA Ref: 14/01295/COFUL). In July 2017 WCC began to establish a more viable renewal option, culminating in the preferred option of demolition and rebuild.

2.2.2 The 2014 application did however trigger the process of decanting residents and a dedicated re-housing team at WCC have been responsible for this. All residents have a right to return following the construction of the Proposed Development. To date, 104 secure tenants and their families have moved from the estate and 59 of those have indicated a desire to return.

2.2.3 Under a separate application, Edgson House, in the south-west of the site, was demolished in September 2019 (Application Ref: 18/08372/COFUL). The demolition of Wellesley House, Wainwright House, Dalton House, Hillersdon House, Pimlico House and Mercer House has also been granted under a Prior Approval Application in 2019 (Application Ref: 19/06951/APAD). These buildings are shown in Parameter Plan EBE-AST-XX-XX-DR-A-010001.

2.2.4 Planning permission has also been granted for the temporary use ('meanwhile use') of the former site of Edgson House (Application Ref: 19/05038/COFUL). Known as Ebury Edge, the site comprises two primary blocks. A two storey block along Ebury Bridge Road will include approximately seven retail units (Class A1) with frontages onto the main road. The second storey will include affordable workspace and office/studio spaces (Class B1).

2.2.5 A second, single storey block will run along the southern edge of the site, containing a café (Class A3) and a community hall (Class D1). The application also includes associated landscaping and temporary structures, including a courtyard community garden. To the rear of the site, the existing green space, including play equipment and a number of trees, is to be retained in this proposal.

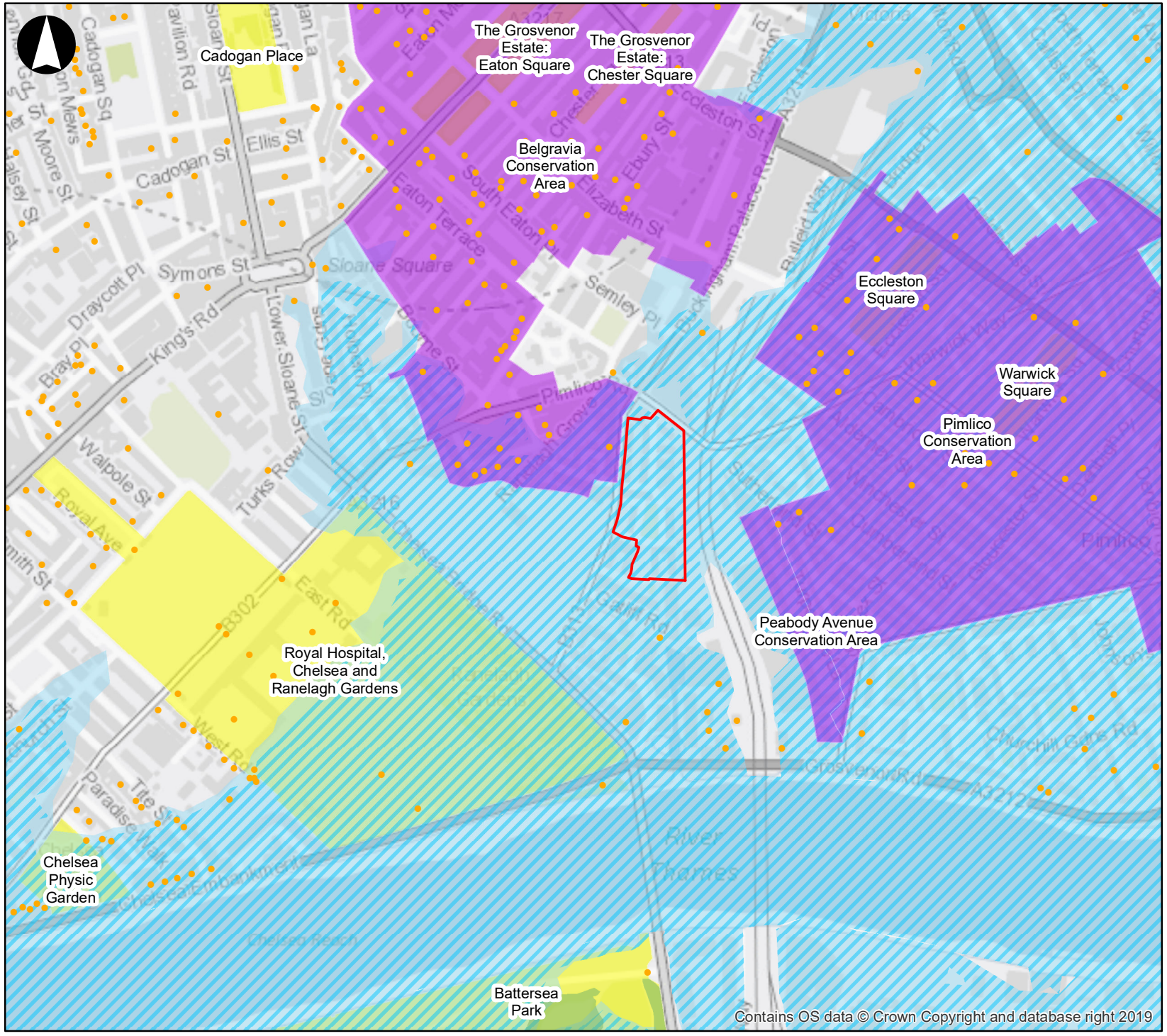
2.3 The surroundings

2.3.1 Figure 3 below shows the environmental designations in proximity to the Ebury Bridge Estate. It is located within a borough-wide Air Quality Management Area (AQMA) and is also entirely within a Flood Zone 3 area. The closest statutory designated site is Battersea Park Nature Areas, a Local Nature Reserve (LNR), approximately 600m south of the site.

2.3.2 There are no listed buildings on the site, but there are a large number of Grade I, II and II* listed buildings within 500m. The closest of these include:

- 20 to 42 (Even) Ebury Bridge Road including garden railings (Grade II) immediately to the west;
- The Royal Hospital (Grade I) to the south-west;
- St Barnabas parsonage and war memorial (Grade II) 180m to the north-west;
- Church of St Barnabas (Grade I) 190m to the north-west;
- White Ferry House Public House (Grade II) 190m to the east;
- Guard's Chapel and former Chelsea Barracks (Grade II) 200m to the west; and
- 40-45 Bloomfield Terrace (Grade II) 200m to the west.

2.3.3 The Belgravia Conservation Area lies on the opposite side of the Ebury Bridge Road to the Proposed Development. The Peabody Avenue Conservation Area lies approximately 150m to the east, on the other side of the rail tracks, and adjacent to this is the Pimlico Conservation Area.



Legend

- Site boundary
- Listed Building
- Local Nature Reserve
- Conservation Area
- Flood Zone 3
- Flood Zone 2
- Historic Parks and Gardens
- Whole area within AQMA

Figure 3: Environmental Designations Map

Metres
0 95 190 380

3 Proposed Development

3.1 Introduction

3.1.1 Sections 3.2-3.4 describe the Proposed Development for which planning permission is sought and which forms the basis of the EIA. Sections 3.5-3.9 cover supporting information relevant to this assessment. Section 3.10 describes the reasonable alternatives considered by the Applicant and the evolution of the design of the Proposed Development, noting the main reasons for selecting the chosen option and including a comparison of the environmental effects.

3.2 The Proposed Development

3.2.1 The following sections set out the Proposed Development for the Hybrid Outline Application. This application comprises an outline planning application (the 'Outline Area') and a full planning application (the 'Detailed Area'). The Detailed Area relates to blocks 7 and 8, whilst the remaining blocks (B1-B6 and B9) form part of the outline permission (Figure 4).

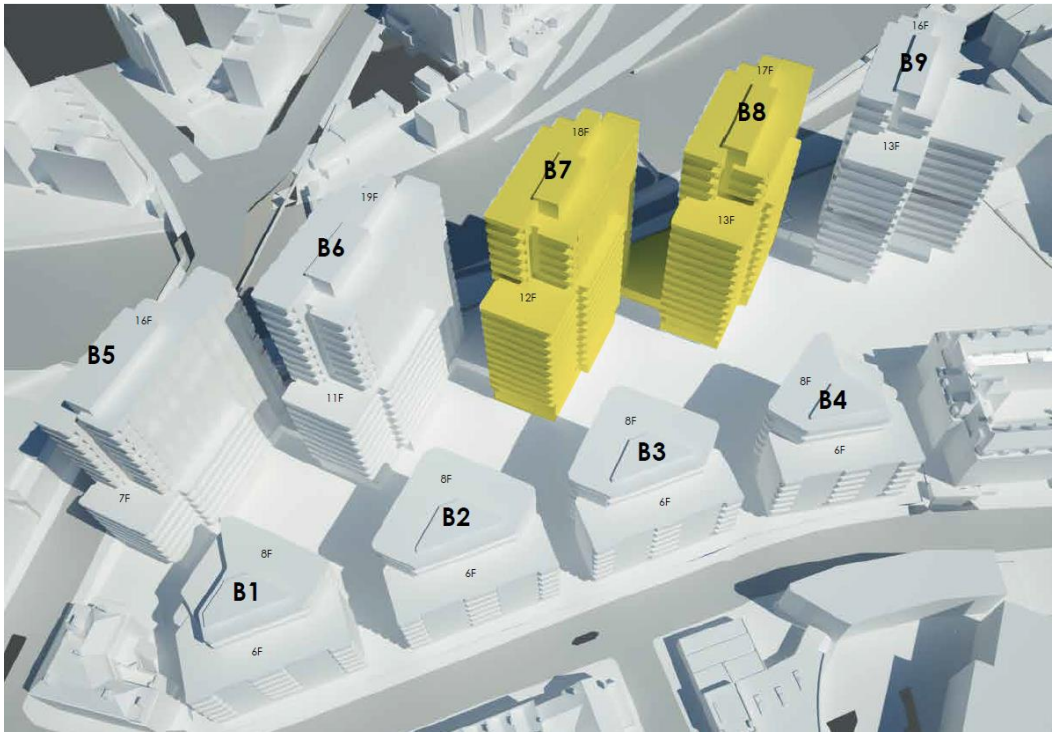


Figure 4: The Proposed Development, blocks 7 and 8 (in yellow) are within the Detailed Area, the remaining blocks are within the Outline Area.

The Outline Area

Overview

3.2.2 The Applicant is seeking outline planning permission as described in paragraph 1.1.4. It is being submitted with all matters reserved.

3.2.3 The outline application is for blocks 1-6 and 9. The outline design proposes four blocks (numbered 1-4) along the western edge of the site, identical in footprint and height, equating to approximately 8 storeys. Blocks 5, 6 and 9 are much taller, with the tallest elements having been set-back to reduce visual impact. The heights equate to approximately 16 storeys for blocks 5 and 9, and 19 storeys for Block 6. These building heights are subject to the details forthcoming as part of future Reserved Matters Applications. Three individual basements are also proposed. One basement is located beneath blocks 2 and 3 and one beneath Block 9. A basement is also proposed beneath blocks 6, 7 and 8, with only the portion under Block 6 forming part of the outline application.

3.2.4 The demolition of Bucknill House, Victoria House, Rye House, Westbourne House, Bridge House and Doneraile House also forms part of the outline application (see Figure 2 for existing buildings).

Design

3.2.5 The outline application is accompanied by a set of Parameter Plans and a Design Code (ref. EBR-05). All Parameter Plans in the outline application are for approval. The Design Code provides a framework to enable the design to be undertaken in a consistent manner which achieves the aspirations for the redevelopment of the site. The WCC LPA will expect reserved matters applications to generally accord with the Design Code, as well as the approved Parameter Plans. The Design Code includes details regarding the character of the site, landscaping, open space, materials and appearance and biodiversity and green space. Alongside the parameter plans, it will also establish building envelopes, access, massing and scale.

3.2.6 Blocks 1 to 4 are aligned along the western border of the site on Ebury Bridge Road, providing an active frontage and maintaining the existing high street. The height of these buildings will be similar to the surrounding area and the Design Code includes aspects such as using similar brickwork to match existing buildings.

3.2.7 The remaining blocks are staggered along the eastern boundary, creating a series of public squares that run through the centre of the site.

Residential

3.2.8 The Outline Area of the scheme will provide up to 532 dwellings and will include a mix of social rent housing, intermediate housing and private housing. An illustrative housing mix for the Proposed Development is set out in Table 2. Across the whole masterplan site, including the detailed part of the scheme, there will be 51% affordable housing units.

Table 2: Illustrative Outline Area housing mix

One bed	Two bed	Three bed	Four bed	Five bed	Total
202	235	81	11	3	532

Non-residential uses

3.2.9 A total of 36,601m^2 of non-residential floorspace is proposed across the Outline Area, the distribution of which is illustrated in Parameter Plans EBE-AST-XX-XX-DR-A-011120, -011121 and -011122. The non-residential units will be located on the perimeter of the development to ensure active frontages, particularly along Ebury Bridge Road, which will have a continuous length of ground floor, non-residential units. Additionally, Block 5 will include a community hall. Space is also provided for a central management hub and potential uses for other areas include a fitness suite, nursery and café.

3.2.10 Table 3 outlines the illustrative proportion of non-residential uses in the Outline Area, subject to the details forthcoming as part of future Reserved Matters Applications.

Table 3: Proposed non-residential uses

Blocks	Uses GIA	
B1, B2, B3, B4	1,600m^2 Class A1 - A4 / D1	**A3** - no more than 460m^2 **A4** - no more than 340m^2 **D1** - no more than 150m^2
B5	350m^2 Class B1 158m^2 Class D1	
B9	910m^2 Class D1 / D2 / A3	**A3** - no more than 130m^2

Landscape and public realm proposals

3.2.11 The landscape plans and Design Code set out the predominant proposed land uses across the site.

3.2.12 Four public squares are proposed, three of which form part of the outline application. The squares are all connected, forming a ‘central spine’ through the middle of the site. The squares are largely vehicle-free, prioritising pedestrian and cyclist movement, and aim to facilitate social interaction and provide a place for larger communal events.

3.2.13 Public areas will be well-lit and overlooked by community and residential spaces, creating secure night-time routes throughout the site. Lighting will also be designed to avoid impact on biodiversity, such as birds and bats.

3.2.14 Podium and roof terraces are also proposed, offering private amenity space for residents, incorporating elements of planting and landscaping. Throughout the site new species of plants and trees will be incorporated into the design and an overall increase in trees is anticipated.

3.2.15 Across the masterplan site, a total of 2,854m^2 of play space is proposed (Table 4). This includes play space for 0-5 years, near to building entrances. Formal play

space for older children will be located in public squares and areas across the site. There is also provision for a Multi-use Games Area (MUGA) to provide a space for a range of sports and activities.

Table 4: Illustrative play space provision

Play Space Type	Provision
0-3 years	869m^2
4-10 years	730m^2
11-17 years	403m^2
Playable landscape	852m^2
Total	2,854m^2

Transport

3.2.16 Ebury Bridge Estate is well-connected to the existing public transport network. Therefore, the development will be essentially car-free apart from disabled parking and motorcycle parking provided. Vehicle access to the site remains necessary for deliveries, servicing and disabled parking users, but the design prioritises cyclist and pedestrian movements. Club car spaces will also be provided as on-street parking.

3.2.17 A total of 1,370 cycle parking spaces will be provided for residents across the masterplan site, with 951 spaces delivered as part of the Outline application. In addition to this, cycle parking will also be provided for residential visitors, retail visitors and retail staff and provision made for a dedicated cycle lane.

3.3 The Detailed Area

Overview

3.3.1 The Applicant is also seeking full planning permission, as described in paragraph 1.1.6.

3.3.2 The full planning application refers to blocks 7 and 8 on the eastern edge of the site, adjacent to the railway, on the land formerly occupied by Wellesley House, Wainwright House, Dalton House and Hillersdon House (see Parameter Plan EBE-AST-XX-XX-DR-A-010001 for the current building layout).

3.3.3 The application also includes new pedestrian access, amenity space, car and cycle parking, refuse storage, servicing areas and other associated infrastructure works.

3.3.4 Blocks 7 and 8 are approximately 18 storeys and 17 storeys in height respectively. A single basement is proposed under both blocks, which will also extend under Block 6 (See paragraph 3.2.3).

3.3.5 To minimise the impact on existing Ebury Bridge Estate residents, it is anticipated that the majority of secure tenants and resident leaseholders will be moved into a new home within the Detailed Area.

Design

3.3.6 The detailed application is accompanied by a series of detailed plans and a Design and Access Statement (DAS) (ref. EBR-05). An essential part of the design is that Blocks 7 and 8 can operate independently before the remaining site is built.

3.3.7 The design comprises two blocks, connected by a podium. The podium will contain amenity space on top and parking underneath. The DAS contains further detail regarding façade, materials and design character. For example, materials and colours have been chosen which seek to break up the massing and minimise solar glare.

3.3.8 Sustainability measures and services will be installed to achieve a maximum daily water usage of 105 litres per person per day. SuDS are also incorporated into the scheme in the roof/podium gardens and the public squares. Further detail is provided in Sections 3.5 and 3.6.

Residential

3.3.9 The Detailed Area comprises 226 dwellings, 112 in Block 7 and 114 in Block 8 (Table 5). Of the 226 dwellings, 58% will be social rent housing and 19% will be intermediate housing.

Table 5: Detailed Area housing mix

	1 bed	2 bed	3 bed	4 bed	5 bed	Total
Block 7	35	49	26	2	0	112
Block 8	33	51	25	4	1	114

3.3.10 **Residential ancillary uses**

3.3.11 A residential communal space ‘the Central Hub’ will be located in Block 7 and will accommodate the main estate office and will include a concierge desk and meeting room, office for the estate manager and back of house areas such as staff welfare facilities and storage areas.

Landscape and public realm proposals

3.3.12 Every residential unit within blocks 7 and 8 will be provided with its own private amenity space. This will be in the form of terraces for units on the ground floor and first floor units fronting the podium and balconies for those above.

3.3.13 Each block will also have an associated podium garden, which is landscaped and equipped with play space and community herb gardens for resident use. Residents of both blocks will have access to each podium they adjoin. Each block will also have its own private roof garden, accessible only for residents of that block.

3.3.14 A public square also forms part of this scheme. Vehicle access to the square is possible, but pedestrians and cyclists will be prioritised. This square will be landscaped, containing planters, trees and play space for communal use.

3.3.15 As set out in the Outline Area, the site will promote biodiversity. Bird and bat boxes will be provided and lighting designed to avoid impact on animal species.

Transport

3.3.16 As described in the Outline Area description, the development is essentially car-free with the exception of disabled parking. As part of the full application, 18 disabled parking spaces will be provided. A proportion of the parking spaces will also be equipped with electric vehicle charging points.

3.3.17 In terms of cycle parking, the basement area will include a cycle store, with Block 7 providing space for 207 bicycles and Block 8 will have 212. A dedicated cycle life is also provided with a direct route through to the exterior.

3.4 Demolition and construction

3.4.1 All existing 13 residential blocks, ancillary plant rooms and garage blocks across the estate are to be demolished with Edgson House already demolished. (Application Ref: 18/08372/COFUL). At this location there will be an interim use comprising a café, workspaces and community facility, as described in paragraph 2.2.4.

3.4.2 The demolition of Wellesley House, Wainwright House, Dalton House, Hillersdon House, Pimlico House and Mercer House was granted under a Prior Approval Application (Application Ref: 19/06951/APAD). However, the potential environmental effects of this demolition is incorporated into this environmental assessment to ensure the full effects of demolition are considered.

3.4.3 The demolition of the remaining blocks forms part of this Hybrid Outline Application. It is intended that these six blocks will be demolished in phases to allow for the progression of the development alongside ongoing decanting of existing residents into new homes.

Construction programme

3.4.4 Demolition of some of the existing blocks at Ebury Bridge Estate is already underway. Table 6 describes the anticipated programme for the Ebury Bridge Estate Masterplan, with the site fully operational by 2028. The construction is split into three phases, illustrated in Parameter Plan EBE-AST-XX-XX-DR-A-011102.

Table 6: Construction programme

Aspect of the Proposed Development	Start date	Finish date
Construction of Detailed Area (Phase 1)	Mid 2021	Mid 2023
Demolition for Blocks 1/5/6 (Phase 2)	Mid 2022	Early 2023
Construction and fit out of Blocks 1/5/6 (Phase 2)	Early 2023	2025
Demolition for Blocks 2/3/4/9 (Phase 3)	Late 2023	Early 2024
Construction and fit out of 2/3/4/9 (Phase 3)	Early 2024	2027

Demolition and construction management plans

3.4.5 A draft Construction Management Plan (CMP) has been developed (ref. EBR-14). This sets out the requirements that will be implemented by the contractor

during the construction period of all phases. There will be a requirement for completion of a CMP, based on this draft CMP, prior to start of construction on site. The CMP also includes a Demolition and Environmental Management Plan (DEMP) covering the management and controls of the enabling works and demolition process.

3.4.6 The CMP follows the Westminster Code of Construction Practice (CoCP)[2] which sets the standards and procedures to which developers and contractors must adhere to when undertaking construction of major projects. Compliance with the Westminster CoCP is required for all projects within Westminster.

3.5 Energy Strategy

3.5.1 An Energy Strategy (ref. EBR-09) forms part of this planning application. It outlines proposals to reduce the on-site energy demand as much as possible through passive design and energy efficient buildings systems.

3.5.2 The energy assessment is structured according to the Mayor's energy hierarchy[3]:

[1] Be lean: use less energy.

[2] Be clean: supply energy efficiently.

[3] Be green: use renewable energy.

3.5.3 Passive strategies will be incorporated to reduce the demand for active heating and cooling. The buildings have been designed with high performance, insulated and airtight facades. Balconies and protruding facades will also shade the balconies and windows below. Mechanical ventilation with heat recovery and energy-efficient lighting will also be provided to all apartments.

3.5.4 Ground source heat pumps, air source heat pumps and water source heat pumps are proposed for a sitewide Energy Strategy. There will be a combination of an active cooling system and openable windows. Due to high levels of ambient noise, residents will have a choice of natural ventilation when external noise levels are quieter. Active cooling allows residents to be both acoustically and thermally comfortable at all times.

3.5.5 The Proposed Development will include a total of 500m^2 of Photovoltaic (PV) panels, generating approximately 114MWh annually. These will be in place on low rise buildings.

3.6 Flood Risk Assessment and Drainage Strategy

3.6.1 A Flood Risk Assessment (FRA) and Drainage Strategy (ref. EBR-07) forms part of this planning application. The site is in a Flood Zone 3 but benefits from existing flood defences. Flood risk from tidal/fluvial sources, pluvial sources, and

[2] City of Westminster, 2016. *Code of Construction Practice* (CoCP). Available at: https://www.westminster.gov.uk/code-construction-practice
[3] GLA, 2020. *Energy Planning Guidance.* Available at: https://www.london.gov.uk/what-we-do/planning/planning-applications-and-decisions/pre-planning-application-meeting-service-0

groundwater are all considered to be low following the application of the proposed Drainage Strategy.

3.6.2 Following a Sustainable Drainage Systems (SuDS) appraisal, the preferred approach to drainage uses a combination of blue roofs, raingardens and geo-cellular attenuation. This will be in place alongside a traditional piped gravity network to collect and transfer surface water flows at the site.

3.6.3 The blue roof system collects roof runoff and discharges it via a piped network to the below-ground drainage network at a restricted rate. Geo-cellular storage will form part of this system within more densely developed areas of the site.

3.6.4 Surface water from hardstanding areas will be captured by SuDS prior to entering the piped stormwater network. Permeable paving will be used throughout the site. Rain gardens are to be included along the footways and highways to capture surface run-off. Where rain gardens are not possible, trapped gullies and channel drains will be used to capture surface water.

3.6.5 It is proposed that stormwater runoff will be attenuated on site and discharged into the existing public surface water sewer network at a restricted rate.

3.7 Transport Assessment

3.7.1 A Transport Assessment (TA) forms part of this application (Ref EBR-08). The TA has been prepared in accordance with Transport for London's (TfL) Healthy Streets TA guidance and following pre-application discussions with WCC and TfL officers. It considers all aspects of movement by residents, employees and visitors, servicing and delivery requirements, and movements associated with the demolition and construction phases.

3.7.2 The TA concludes that in terms of the site and surroundings, the Proposed Development is already highly accessible and that enhancements to pedestrian permeability and connectivity as a result of the proposed public realm improvements form part of the scheme design.

3.7.3 In terms of the Active Travel Zone Assessment, the public realm proposals will enhance the local pedestrian and cycling network. New pedestrian and cycling access points will be created which will meet pedestrian desire lines to key destinations and reduce pedestrian flows on surrounding roads.

3.7.4 Detailed analysis of the likely trip generation associated with the development proposals, and assessment of the potential impacts of these trips on the local transport networks has concluded small increases in trips across all modes occur in the AM and PM peak hours as a result of the proposed development. In the context of the existing public transport usage / capacities, existing walking and cycling infrastructure, and existing vehicular flows, these increases are considered to be negligible and are not considered to cause any adverse impacts on the operation of the local transport networks. Mitigation is embedded within the design of the scheme in the form of improved site layout, new access points, high quality cycle parking facilities, car club provision, safeguarded space for additional cycle hire docking points and a Travel Plan (see EBR-08). Trip generation figures have informed the assessment of Air Quality, Noise and GHG effects in this ES.

3.7.5 The TA also provides a summary of the potential transport issues associated with the construction phase of the proposed development and the proposed mitigation measures. It outlines that a draft CMP (Ref EBR-14) has been prepared in support of the planning application and that a detailed CLP is expected to be secured by planning condition / obligation. This would set out measures to reduce HGV trips and minimise the interaction between HGVs and vulnerable road users. The TA has informed the assessment of Air Quality, Noise and GHG effects during construction in this ES.

3.8 Climate change resilience

3.8.1 The following potential climate hazards relevant to the Proposed Development have been identified:

- surface water flooding;
- overheating; and
- wind conditions.

3.8.2 To address these adaptation measures have been embedded within the design:

Surface water flooding

3.8.3 Surface water flooding poses a risk to the site. The proposed drainage system for the site (detailed in Section 3.6) has been designed for a 1 in 100-year event, plus 40% to account for the risk of climate change. This ensures flooding from a 1 in 100 year event is manageable throughout the site.

3.8.4 The proposed system of SuDS and attenuation features will minimise discharge from the site to alleviate off-site flood risk/surcharging and ensure that surface water within the development is managed to appropriate levels (including climate change).

Overheating

3.8.5 As described in Section 3.5, the Energy Strategy for the site outlines how the buildings have been designed with high performance, insulated and airtight facades. However, windows can also be opened to allow for natural ventilation. Balconies shade the facades for the units below and will be accessed via full height, fully glazed sliding doors to help reduce overheating. Protruding façade elements will also provide shading to all windows.

3.8.6 Additionally, water harvesting measures, including a recycled water system, are incorporated into the design to reduce the reliance on future water demands in drought conditions.

3.8.7 The landscape design (see EBR-05) also incorporates a tree planting strategy which will achieve a large canopy cover, providing shading and cooling in the summer throughout the public areas of the site. Drought-tolerant plants also form an important part of planting strategy.

Wind conditions

3.8.8 The buildings have been designed to ensure that residents and visitors to the site are safe and secure during windier conditions. Taller blocks cascade in height with various podium levels whilst the smaller blocks along Ebury Bridge Road are of a uniform height. This helps to deflect down drafts and make wind conditions more comfortable on site. For the taller blocks, this is assisted further by podium massing and balcony configuration at lower levels.

3.8.9 Additionally, landscaping changes have been recommended to ensure wind conditions in particular areas of the site are comfortable. Further detail is described in Section 11.

3.9 Waste

3.9.1 Waste will be generated by excavation, demolition and construction activities taking place during the Detailed Area (completed by 2023) and the Outline Area (completed by 2027) and during operation of the completed development (2028 onwards).

3.9.2 The excavation activities undertaken are forecast to generate approximately 86,000 tonnes of excavated material, from basement excavation activities. As the Proposed Development is broadly consistent with the surrounding levels, there are very limited opportunities to reuse site-won soils, therefore the excavated material will be re-used off-site. Disposal to permitted landfill will be considered only as a last resort. Smaller additional quantities of excavated material are expected to arise from the construction of foundations and small retaining structures. Sufficient design information is currently unavailable to permit a reasonable forecast of these quantities.

3.9.3 The demolition of buildings are forecast to generate approximately 52,856 tonnes of waste. The break-up of hardstanding areas will generate small additional quantities of demolition material, which will become known from the undertaking of a pre-demolition audit by the assigned contractor. Suitable processing will be undertaken to maximise the proportion of the demolition material that can be recovered on-site as aggregate, general fill and for use in piling matts. Where possible, the remainder will be recovered off-site by appropriate waste management contractors. It is expected that a small proportion of the demolition arisings will be hazardous or otherwise unsuitable for reuse; this material is likely to require disposal off-site at suitably permitted landfill sites.

3.9.4 The construction activities undertaken are forecast to generate approximately 24,782 tonnes of waste. Designing-out waste opportunities, such as using prefabricated facades and external cladding are being explored throughout the design development, to minimise the quantity of waste generated during construction. Where waste cannot be avoided, on-site and off-site segregation will be used to maximise the proportion of the waste which can be reused, recycled and recovered, in accordance with the waste hierarchy.

3.9.5 Operational waste is expected to be generated from 2023 onwards, when Phase 1 of construction will be completed. The largest quantities of operational waste will be generated when all phases of construction will be completed; in 2028. Based

on forecasts using current waste generation data, when fully complete and operational, the Proposed Development is expected to generate 960 tonnes/annum of residential waste and 1,130 tonnes/annum of commercial waste. It is expected that the quantity of operational waste generated by the Proposed Development will decrease in future years of operation, as waste prevention measures and circular economy targets driven by national and local policy will impact more significantly upon consumer consumption behaviours and material usage across the supply chain of businesses.

3.10 Alternatives

3.10.1 This section describes the main alternatives considered by the Applicant and an indication of the main reasons for the choice made, taking into account the environmental effects, in accordance with the EIA Regulations.

3.10.2 There has been a long-term aspiration to regenerate the Ebury Bridge estate since 2010 when the estate was first identified in WCC's Housing Renewal Strategy[4]as one of five key estates within the borough in need of significant investment. The strategy sets out WCC's priorities to:

- increase the supply and quality of affordable homes;
- improve the quality of local environment, including green and open space;
- promote a high quality of life for people and create safe and healthy neighbourhoods;
- enable people to maximise economic opportunities; and
- create a more distinct sense of neighbourhood.

3.10.3 It also specifically identifies increased maintenance costs for WCC and poor value for money for residents of Ebury Bridge Estate as a consideration in the redevelopment of the site.

3.10.4 In 2014 plans were submitted to demolish and rebuild blocks along the eastern side of the site and the site of the now demolished Edgson House at the south-west of the site (LPA Ref: 14/01295/COFUL). Planning permission was granted, but the scheme was found unviable.

The eight scenarios

3.10.5 In 2017 WCC looked at a long list of scenarios for the future of the Ebury Bridge estate. These ranged from full refurbishment through to full redevelopment and a number of hybrid options. For each scenario, WCC went through a methodical assessment and involved both the Community Futures Group and estate residents at each stage of this testing. The eight possible scenarios are set out below:

[4]City of Westminster, 2010. Westminster Housing Renewal Strategy. Available at: http://transact.westminster.gov.uk/docstores/publications_store/wcc_housing_renewal_report2010_lowres.pdf

- **Scenario 1**: Complete refurbishment – no new build;
- **Scenario 2:** The Consented Scheme (part refurbishment / part demolition and new build). Full refurbishment of Doneraile, Rye, Victoria, Westbourne and Bucknill Houses;
- **Scenario 3:** Consented Scheme Plus (this is the same as Scenario 2, part refurbishment, part demolition & increased numbers of new build homes). Full refurbishment of Doneraile, Rye, Victoria, Westbourne and Bucknill Houses;
- **Scenario 4:** Part refurbishment / part demolition and new build. Full refurbishment of Rye, Victoria, Westbourne and Bucknill Houses;
- **Scenario 5:** Part refurbishment / part demolition & new build. Full refurbishment of Doneraile House;
- **Scenario 6:** Complete demolition of the whole estate & new build –increased density to around 650 new homes. Full redevelopment of the whole estate carried out over a number of phases (subject to discussions with a delivery partner). Decanting, demolition and re-provision of all blocks;
- **Scenario 7:** Complete demolition of the whole estate & new build. Around 750 new homes. Full redevelopment of the whole estate carried out over a number of phases (subject to discussions with a delivery partner). Decanting, demolition and re-provision of all blocks; and
- **Scenario 8:** Complete demolition of the whole estate & new build. Around 800 new homes. Full redevelopment of the whole estate carried out over a number of phases (subject to discussions with a delivery partner). Decanting, demolition and re-provision of all blocks.

3.10.6 Each scenario was then tested against three overarching criteria, which were developed in collaboration with the existing residents of the estate. The criteria were:

- Desirability – how does each scenario meets the Council's strategic objectives and priorities of residents and local stakeholders;
- Viability – how is each scenario financially viable and sustainable; and
- Deliverability/Feasibility – how can each scenario be implemented and attract a delivery partner.

3.10.7 Within these three overarching criteria was a series of sub-criteria which include a number of environmental criteria. The following matrix show how each scenario scored against the set criteria and associated sub-criteria.

		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8
Viability	Financial viability	Poor	Poor	Good	Good	Good	Good	Good	Good
	No additional loss to WCC	Poor	Poor	Good	Good	Good	Poor	Excellent	Excellent
Desirability	Address housing needs	Poor	Fair	Good	Good	Good	Excellent	Excellent	Excellent
	Increase in affordable housing	Fair	Good	Good	Excellent	Good	Excellent	Excellent	Excellent
	Quality of green open space	Poor	Fair	Fair	Fair	Fair	Excellent	Excellent	Excellent
	Improved building performance	Fair	Good	Good	Good	Good	Excellent	Excellent	Excellent
	Quality of built form	Fair	Fair	Fair	Fair	Good	Excellent	Excellent	Excellent
Deliverability	Phasing	Fair	Poor	Poor	Poor	Excellent	Good	Good	Good
	EqIA outcome - see methodology below	Fair	Fair	Fair	Fair	Fair	Good	Good	Excellent
	Impact on surrounding buildings	Excellent	Fair	Poor	Fair	Fair	Good	Good	Poor
	Impact on Conservation Area		Good	Poor	Excellent	Fair	Good	Fair	Poor
	Ease of obtaining planning approval		Good	Poor	Fair	Fair	Good	Fair	Fair

On this matrix are the eight scenarios ranging from the full refurbishment scenario through to wholesale redevelopment and re-provision of all existing homes with new high quality homes.

This matrix shows how each scenario is scored against a set criteria (using the latest current assumptions).

Key

Poor | Fair | Good | Excellent

Figure 5: Scoring for each alternative scenario[5]

[5] City of Westminster. *Shaping the preferred scenario.* Available at: https://www.westminster.gov.uk/sites/default/files/shaping_the_preferred_scenario-_ebury_bridge_estate_0.pdf

3.10.8 The Ebury Bridge community has been central to the process in developing the preferred scenario. As part of the process the design team has been listening to the ideas, concerns and aspirations from the community.

3.10.9 The feedback received has influenced the development of the preferred scenario and has provided a baseline for WCC in terms of understanding how and what the community would like to see in any final proposed scheme.

3.10.10 WCC wants to create a place that has been shaped by residents, responding to their ambitions and aspirations. WCC's aim is to work with residents to design high quality homes and look to improve connections and transport links from Ebury Bridge. WCC also wants to create healthy and sustainable environments where residents can thrive for years to come.

Preferred scenario

3.10.11 Following the process of assessment, WCC's preferred scenario for Ebury Bridge Estate is the complete redevelopment of the Estate as set out in Scenario 7. This includes phased decant, demolition and deprovision of existing homes and provision of around 400 additional new homes, new community facilities, retail units and public spaces.

3.10.12 As shown on the matrix above, Scenario 7 was one of the highest scoring options in terms of both viability and desirability. It was assessed as excellent in terms of addressing housing need, the quality of green space and the built form, and building performance. It also scored relatively highly on deliverability, having minimal impacts on surrounding buildings, equalities outcomes and phasing and fair on impacts on the adjacent Conservation Areas and ease of obtaining planning approval.

3.10.13 The benefits of the complete redevelopment of Ebury Bridge Estate in Scenario 7 include:

- Re-providing homes to meet resident's housing needs and provide high quality homes with lower energy and maintenance costs;
- Providing a significant number of new affordable homes in Westminster;
- Integrating new community facilities, including a community centre, multi-purpose games area, play spaces and community gardens;
- Re-providing retail units and improving access and deliveries to the Estate;
- Improving the quality of the public spaces and addressing issues of security and safety; and
- Creating a place with a unique identity.

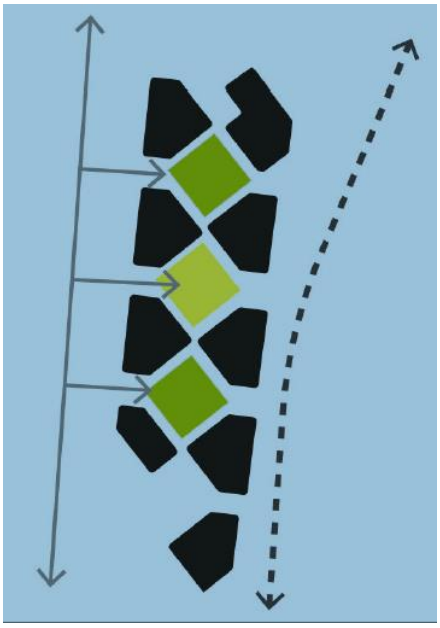
Design evolution

Heights and massing alternatives

3.10.14 Three different massing strategies have been considered for the development of the estate. The key considerations influencing massing choice included:

- Central public space;
- Maximising open green spaces hierarchy;
- Improved connections north-south and into and out of site;
- Good separation between buildings;
- Public realm daylight, and the effect on the quality of the public realm;
- Internal performance: building relationship and open space;
- Internal performance: living space and open space;
- Resident daylight – vertical skyline component (VSC) within homes. Including comparison with the existing estate;
- Context relationship – with adjacent buildings/developments – daylight/sunlight and scale;
- Wind environment; and
- Impact on views.

3.10.15 The three options are outlined below.

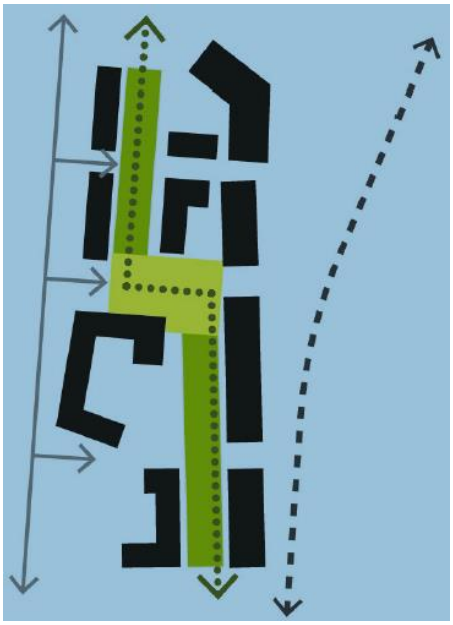


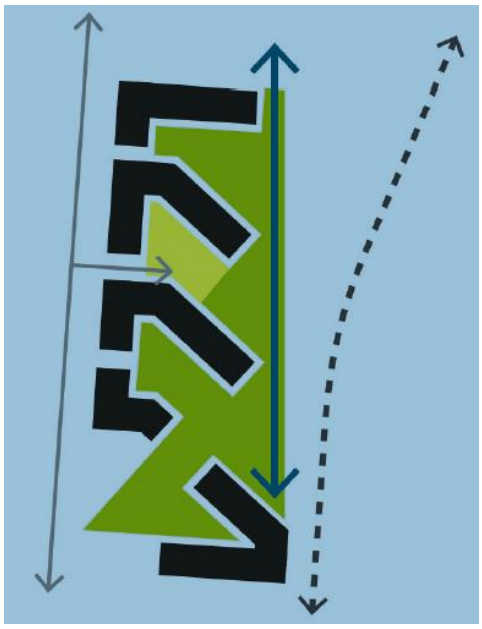
Option 1:

- Large residential squares create character of masterplan
- Community Central Square
- Daylight driven design to maximise open spaces
- Good connections to surrounding context
- Maximum dual aspect homes (around 90%)
- Provision for up to 750 homes

Option 2:

- Shorter distances between buildings
- One Community Central Square
- Tall wall of residential on railway side to meet homes required and viability
- Good connections to surrounding context
- Fewer dual aspect homes (63%)
- Provision for up to circa 500 homes





Option 3:

- Scheme orientated to face railway
- Railway side gardens
- Tall towers required to meet homes required and viability
- Daylight in open spaces compromised by east/west buildings
- Fewer dual aspect homes (70%)
- Provision for up to circa 600 homes

Preferred option

3.10.16 The preferred option is based on Option 1 above. The building form of this option was chosen for the following environmental considerations:

- Creates more open space between the blocks;
- Provides improvements in daylight/sunlight availability, over the other options; and
- Maximises double aspect properties, providing better levels of daylight within the residential properties.

Daylight/sunlight

3.10.17 Further work on the massing of the blocks was undertaken in response to concerns raised by a number of residents in neighbouring blocks about the

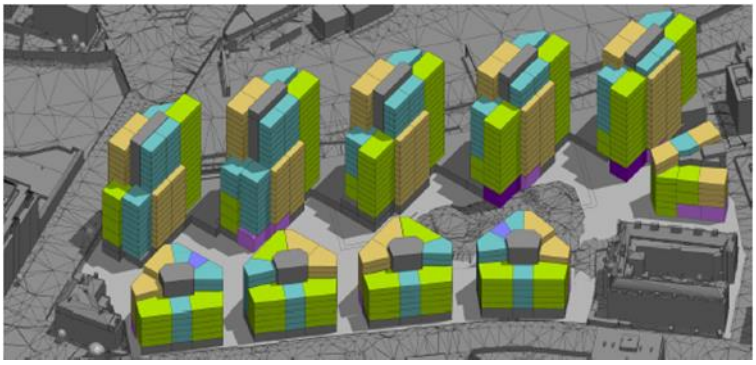
potential impact on daylight and sunlight coming into their homes as result of the taller blocks.

3.10.18 As a result, the massing/height of blocks 1,4 and 5 were reduced and blocks 9 and 10 redesigned (See for Parameter Plan EBE-AST-XX-XX-DR-A-011130 for building heights). The reconfiguration of Block 9 means that it no longer impacts as significantly on Cheylesmore House which lies just outside the south-western boundary of the site. The height of shoulders on blocks at the northern end of the site have been reduced to mitigate any potential impacts on daylight/sunlight availability at No.1 Ebury Bridge Road and Consort Rise House. These amendments have been assessed using daylight analysis software and were shown to result in improvements of compliant windows and reduced loss of Vertical Sky Component (VSC).

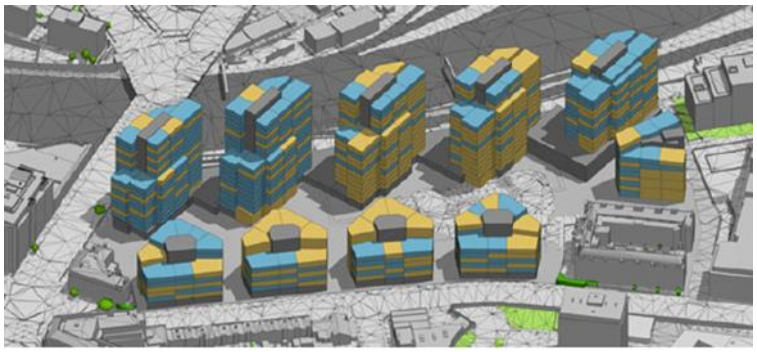
Homes mix alternatives

3.10.19 A number of options were explored around internal tenure options and the mix of affordable and market housing. Four main options were looked at:

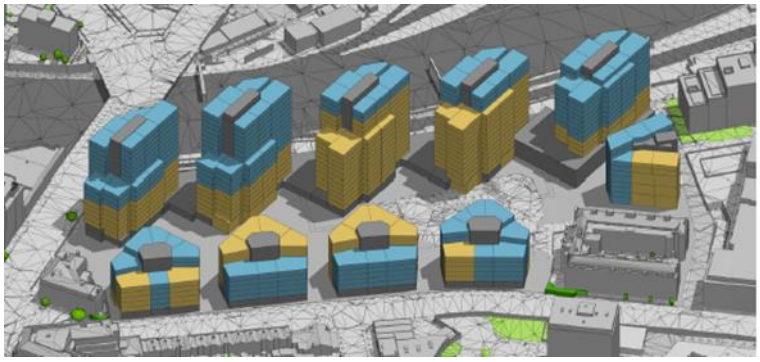
Option 1: Tenure by separate blocks



Option 2: Distributed tenure mix



Option 3: Horizontal tenure mix



Option 4 Vertical tenure mix

Preferred option

3.10.20 A hybrid of Option 2 and 3 is considered the preferred option and is to be delivered in the first phase as set out within the detailed application. It is proposed that individual floors are single tenure but that affordable homes floors will be distributed throughout the Masterplan area with the view to establish a more balanced community. Blocks will be tenure blind and there will no identifiable typologies or 'lesser design' for the affordable housing options.

4 Approach to assessment

4.1 EIA process

4.1.1 The assessment of the Proposed Development has been undertaken in accordance with the EIA Regulations and relevant guidance[1]. EIA is a staged, iterative process. Each stage builds upon the preceding stages with the aim of having a positive influence on the Proposed Development. Each of the stages is described in the following sections.

4.2 The need for EIA

4.2.1 The EIA Regulations define an EIA development as that which is either within Schedule 1 or 2 of the EIA Regulations and, in the case of Schedule 2 developments, is likely to have significant effects on the environment by virtue of factors such as its nature, size or location. The Proposed Development falls under Schedule 2 10(b) of the EIA Regulations and therefore an EIA is required.

4.3 Scoping

4.3.1 Scoping is the process of identifying the people and environmental resources (otherwise referred to as 'receptors') with the potential to be significantly affected by the Proposed Development. It has been carried out in accordance with relevant guidance[6]. Collaboration with the designers and the wider project team has allowed measures to prevent and reduce adverse environmental effects and to introduce beneficial effects to be embedded into the Proposed Development. The scope of the EIA has therefore been determined proportionately to allow the process to focus only on those effects with genuine potential to be significant.

4.3.2 An EIA Scoping Report[7] was prepared and submitted to the planning authority on 20 September 2019. This set out the potentially significant effects on identified receptors and a proposed scope of work for the EIA as well as the methodologies proposed to be used for the assessment. The planning authority provided a Scoping Opinion[8] on 6 December 2019.

4.3.3 Appendix A3 sets out how the EIA has responded to and complies with the Scoping Opinion, as required under Regulation 18, paragraph 4(a) of the EIA Regulations.

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[6] Environmental Impact Assessment of Projects, Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) https://ec.europa.eu/environment/eia/pdf/EIA_guidance_Scoping_final.pdf and Delivering Proportionate EIA, A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice https://www.iema.net/policy/ia/proportionate-eia-guidance-2017.pdf

[7] Arup (2019) Ebury Scoping Report https://idoxpa.westminster.gov.uk/online-applications/files/942CCD75285DB3674A2112645F825365/pdf/19_07372_EIASCO-EIA_SCOPING_REPORT-6145573.pdf

[8] Westminster City Council (2019) Ebury Scoping Opinion https://idoxpa.westminster.gov.uk/online-applications/files/85065768A438EDEA0B36C4BFF0538B18/pdf/19_07372_EIASCO-DECISION_NOTICE-6252069.pdf

4.4 Stakeholder engagement

4.4.1 In addition to the scoping process, consultation was undertaken with certain bodies having responsibilities or an interest in environmental issues relevant to the site and the Proposed Development. The topic sections of this ES each contain a description of the stakeholder engagement undertaken.

4.5 Baseline data gathering

4.5.1 Baseline data on the existing environmental conditions within and around the site has been obtained. It includes:

- survey information as defined within each topic section;
- aerial photographs and maps of the site and surroundings;
- published documentary information on environmental conditions in the vicinity of the site; and
- environmental data provided by consultees.

4.5.2 The baseline data used in the assessment takes account of a changing climate. Where future conditions are expected to differ from current conditions as a result of climate change, this has been duly considered.

4.5.3 The data used in the baseline is detailed in each of the topic sections of this ES.

4.6 EIA consideration of climate change

4.6.1 In accordance with the EIA Regulations, the impact of the project on climate has been included. Resilience to climate change is presented in Section 3.7. An assessment of GHG emissions is presented in Section 7. Within each topic the change on the environment, resources, and community in the presence of climate change (in-combination climate change impacts) are integral to the assessment.

4.6.2 Climate change projections including winter and summer temperature and precipitation using the latest UK Climate Projections have been embedded into the future baseline of the technical assessments, consistent with the Institute of Environmental Management and Assessment (IEMA) Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation (2015)[9].

4.6.3 Climate change projections were obtained for the main climate variable characteristics for the high emissions scenarios. Table 7 summarises the overall climate change trends obtained using UKCP18 projection data for changes in average conditions and extreme weather events. The trends summarised represent the average of the projected changes for Ebury. Data for the low emissions scenario has not been considered in line with the precautionary approach taken by the majority of organisations who submitted progress reports under the second round of the climate change adaptation reporting power[10].

[9] IEMA (2015) EIA Guide to Climate Change Resilience and Adaptation. Available at: https://www.iema.net/policy/ghg-in-eia-2017
[10] Defra, 2017. Climate change adaptation reporting: second round reports. Available at: https://www.gov.uk/government/collections/climatechange-adaptation-reporting-second-round-reports

Table 7: Summary of main climate change trends for Ebury and future extreme weather events. UKCP18 projections were generated for the grid reference: 528563, 178364

Climate variable characteristic (baseline value in brackets for period 1981–2000)	**Overall trend (increase or decrease)**	**Projected baseline (mean)**	**Quantitative summary— central estimate 2070s (2060-2079) for high emissions scenario (3) Absolute values**	**Quantitative summary— central estimate 2070s (2060-2079) for high emissions scenario***	**Qualitative summary**
Winter mean temperature (5.67°C)	↑	n/a	-	+ 2.51°C	The largest increase in temperature is estimated to be in the daily mean temperature in summer (high emissions scenario and 50% level).
Summer mean temperature (17.77°C)	↑	n/a	-	+ 3.77 °C	
Winter mean precipitation (1.64 mm/day)	↕	n/a	-	+ 17.9 %	Winter precipitation is projected to increase slightly by the 2080s for the high emission scenarios
Summer mean precipitation (1.54 mm/day)	↕	n/a	-	- 28.7 %	Summer precipitation is projected to decrease for the 2080s
Annual number of days with high temperature (max temperature higher than 25°C) (23.9 days)	↑	13.7 days	82.4 days	+ 68.7 days	The annual number of days with high temperature is projected to increase for the 2080s.
Annual number of frost days (less than 0) (26.6 days)	↓	26.4 days	3.0 days	- 23.4 days	The annual number of frost days is projected to decrease for the 2080s.
Annual number of days with 'heavy rain' (precipitation higher than 25mm/day) (1.1 days)	↑	1.4 days	2.1 days	+ 0.7 days	Increase in the variability of rainfall patterns in the region for the high emission scenario.
Annual number of dry spells (10 or more consecutive days without precipitation (defined as 0.2mm) (5.6 dry spells)	↑	1.2 dry spells	2.8 dry spells	+ 1.6 days	
Summer highest daily maximum temperature (30.37 °C)	↑	29.62 °C	36.9°C	+ 7.3 °C	Projected increase by the 2080s.

4.6.4 Qualitatively this means that from now and for at least the next 50 years the area within which the project lies is likely to experience:

- warmer, drier summers;
- milder, wetter winters;
- an increase in annual average temperature;
- fewer days with snow and frost;
- increased likelihood of a higher frequency of very hot days;
- increased likelihood of intense downpours of rain (particularly in summer); and
- an increase in dry spells.

4.6.5 Moreover, it is likely, although with increased uncertainty, that there will be a heightened probability of the following extreme weather events due to climate change:

- short periods of intense cold weather (still expected due to natural variability); and
- an increase in the frequency of storms and high winds (generally considered as difficult to predict with any certainty).

4.7 Assessment, mitigation and residual effects

4.7.1 The EIA has been undertaken as an iterative process with environmental specialists providing feedback to the construction and design process. The Proposed Development reflects the final design, incorporating measures to avoid, prevent and reduce adverse environmental effects and, where practicable, to introduce environmental benefits.

Baseline environment

4.7.2 The assessment looks at the effects on the baseline environment. As the estate has undergone extensive change, with decanting and initial demolition, the baseline will vary from topic to topic. Each topic has clearly described the baseline environment considered within the assessment and will consider all, or some of the following:

- Historic baseline (prior to decanting and any demolition);
- Existing baseline (partially decanted with Edgson House demolished);
- Future baseline (mid-2021, at the start of construction of the Detailed Area. This includes the six buildings removed under prior approval and the meanwhile uses in situ); and
- Future baseline (2028, no development scenario. This includes the six buildings removed under prior approval).

4.7.3 Each topic assumes the baseline conditions which will reflect the reasonable worst case in terms of the assessment of potential effects against the baseline environment.

Assessment of significance

4.7.4 For each topic included in the assessment, the likelihood of significant effects arising has been considered in terms of:

- demolition and construction effects, i.e. temporary effects likely to arise from demolition or construction activities;
- existence effects, i.e. those which arise from the physical presence of the development; and
- operational effects, i.e. effects from operational activities.

4.7.5 Effects have been described as significant or not significant, and beneficial or adverse, consistent with the EIA Regulations. The effects arising directly from the Proposed Development as well as indirect and secondary effects are encompassed by the assessment.

4.7.6 The assessment years are clearly set out in each assessment. Where appropriate, the assessments consider the following scenarios:

- Peak construction activity;
- Interim effects - effects on receptors during various phases of the development including:
  - Impacts on existing receptors during construction of the Detailed Area; and
  - Impacts on new occupiers of the Detailed Area during construction of the Outline Area; and
- Full build-out/operation.

Assessment structure

4.7.7 Each assessment presented in this ES is based on the project description given in Section 3. The format for presenting the assessment is the same for each topic throughout the ES. For each topic, the following sections are included:

- introduction – an introduction to the topic;
- scope of assessment – describing the considerations taken when determining the scope of the assessment, including effects that have been scoped-out;
- consultation – a summary of consultation undertaken with stakeholders to inform the assessment;
- methodology – the methods used for the prediction and assessment of likely significant effects on identified receptors is outlined along with the assumptions and limitations applicable to the assessment, with the full methodology appended;
- baseline – this describes existing environmental conditions within the defined assessment area for each topic. Where relevant, the future baseline is also described;
- embedded and good practice measures relevant to each topic, as defined in paragraph 4.7.9;

- assessment of effects – this describes the likely significant environmental effects that could arise as a result of the Proposed Development;
- additional mitigation relevant to each topic, as defined in paragraph 4.7.12;
- residual effects – taking account of additional mitigation, the residual effects have been assessed and reported;
- cumulative effects – in this section, effects which may be elevated due to the combined effects of the Proposed Development with other developments have been identified; and
- assessment summary matrix – this tabulates the effects, additional mitigation and residual effects for each topic on a receptor basis.

4.7.8 The topic-specific assessment methodologies are outlined in each topic section with the full methodologies appended. These refer to relevant legislation and guidance and set out the significance criteria applied to the assessment. Where the methodology varies between construction, existence and operational effects, this is explained. The approach to gathering baseline information is described along with how this is used in the assessment.

Mitigation

4.7.9 In line with guidance from the Institute of Environmental Management and Assessment (IEMA)[11] and professional best practice, consideration has been given to three key types of mitigation:

- embedded mitigation;
- good practice mitigation; and
- additional mitigation.

4.7.10 Defined as *"an intrinsic part of the project design"*, embedded measures are a fundamental component of the design of the Proposed Development described in Section 3. They comprise measures to avoid, prevent or reduce adverse environmental effects by altering the design and have arisen through the design evolution process described in paragraph 3.4.1. Measures to introduce or enhance beneficial effects are also included in this category. As they form part of the Proposed Development, these measures will inherently be delivered and are therefore taken into consideration in the assessment of effects.

4.7.11 Good practice measures are defined as actions *"required regardless of any EIA assessment"* and are imposed as a result of standard good practice and/or legislative requirements. For example, these would include practices to manage contractor activities and minimise nuisance effects. The Applicant commits to implementing such good practice measures, and experience indicates that they can reasonably be delivered. Therefore, they have been considered to form part of

[11] Institute of Environmental Management & Assessment (2015) IEMA Environmental Impact Assessment Guide to: Shaping Quality Development. Available at: http://www.iaia.org/pdf/wab/IEMA%20Guidance%20Documents%20EIA%20Guide%20to%20Shaping%20Quality%20Development%20V6.pdf

the Proposed Development and are taken into account in the initial assessment of effects. An example of this is WCC's CoCP, described in Section 3.4.

4.7.12 The third category is where an adverse effect requires additional mitigation to reduce significant effects. This follows the initial assessment which takes into account both embedded and good practice measures.

4.7.13 Additional mitigation measures have been taken into account when evaluating residual effects, i.e. those effects remaining after all measures/mitigation has been taken into account. These measures are expected to be secured through the application of appropriate planning conditions.

4.7.14 A schedule has been prepared documenting all measures committed to for the Proposed Development, comprising all three types of mitigation described above. This is included in Appendix A4 and includes the mechanism by which the measures will be taken forward as the project is implemented.

4.7.15 The assessments take account of the impact of the Proposed Development on the receiving environment and community in the presence of climate change, known as In-combination Climate Change Impacts (ICCI).

4.8 Cumulative effects

4.8.1 Cumulative effects arise from the combination of the Proposed Development and other developments not yet constructed or currently under construction in the vicinity, acting together to generate elevated or altered levels of effects.

4.8.2 A review of consented and planned developments in the vicinity of the site was undertaken in May 2020. The methodology for identifying relevant developments and the list of developments identified were submitted to the planning authority as part of the Scoping Report. No specific comments were received. The cumulative assessment methodology is presented in Appendix A5.

4.9 Interactive effects

4.9.1 Schedule 4 of the EIA Regulations requires an ES to include an assessment of interactive effects. This is an assessment of multiple effects on a single receptor, i.e. bringing the outcomes of the individual topic assessments together. Where it is technically feasible to combine effects into a single assessment this has been done, with the effects reported in the topic sections of this ES.

4.9.2 Where it is not technically feasible to combine effects on a receptor, the individual effects are reported on a receptor-by-receptor basis in Section 1.3. This allows the aggregation of effects on each receptor to be appreciated.

5 Air quality

5.1 Introduction

5.1.1 This section describes the likely significant effects of the Proposed Development on air quality. It outlines the methodology, the baseline conditions and the likely significant air quality effects associated with the construction and operation of the Proposed Development. Mitigation measures that would be implemented to reduce the effect of the Proposed Development on air quality are also described, where relevant.

5.2 Scope of the assessment

5.2.1 The scope of the air quality assessment is summarised in Table 8.

Table 8: Air quality assessment scope

Assessment	Construction	Existence	Operation
Construction dust	×	n/a	n/a
Traffic emissions	✓	n/a	×
Combustion plant emissions	n/a	n/a	n/a
Air Quality Neutral (AQN)	n/a	n/a	✓
Rail	n/a	n/a	×

5.2.2 A Scoping Opinion was received from the Westminster City Council (WCC) on 6th December 2019. This included 11 comments relating to air quality. Responses to these comments are detailed in Appendix A3. In summary, comments relating to traffic emissions, cumulative construction traffic effects, combustion plant emissions, Air Quality Neutral assessment, use of data from Heathrow airport, future occupiers, air quality objectives, committed development, street canyons, operational vehicle trips and construction dust monitoring have all been addressed.

5.2.3 It was also recommended that a site-specific local diffusion tube survey was undertaken. This was not possible due to the time constraints of the project, however representative local authority monitoring was used, and a site visit was carried out to verify the location of the monitoring point. The use of local authority monitoring allows a robust assessment to be carried out by verifying the predicted modelled concentrations against real world monitoring. The monitoring site selected for model verification have a suitable data capture. It was requested that receptors should be agreed with the WCC Environmental Health Officer (EHO). An email detailing methodology and receptor selection was sent to the WCC EHO on 1st October 2019 (Appendix B11), but no reply was received.

5.2.4 Following the submission of the EIA Scoping Report additional information regarding traffic changes and boilers has changed the scope of the air quality assessment. The key points are as follows:

- Operational phase traffic (including service and delivery trips) has been screened against the EPUK/IAQM thresholds and a detailed assessment has been carried out due to the operational traffic exceeding the criteria; and
- There are no boilers included in the design for the Proposed Development therefore, an assessment of boiler emissions has been screened out of this report and are not mentioned in this report further.

5.2.5 Scoping out of combustion plant emissions and the scoping in of a detailed operational assessment are the amendments from the original scoping report.

5.2.6 No existence effects for air quality have been identified and therefore are scoped out. The effects of construction traffic would only be felt during the construction phase and are therefore considered as temporary effects and not existence effects. In addition, the Proposed Development would not create any new street canyon effects that would affect any existing sensitive receptors in the local area.

5.3 Consultation

5.3.1 An email was sent to the Environmental Health officer at WCC on 1st October 2019 summarising the scope of the air quality assessment. Responses have been provided to the WCC Scoping Opinion (Appendix A3).

5.4 Methodology

Overview

5.4.1 This section outlines the methodology for assessing the likely significant effects on air quality from the demolition, construction and operation of the Proposed Development. Full details of the methodology, including how relevant key legal requirements, planning policy and guidance have informed the assessment; the receptor sensitivity, impact magnitude and significance criteria that has been applied and any relevant assumptions and limitations, can be found in Appendix B.

Baseline methodology

5.4.2 Existing or baseline ambient air quality refers to the concentration of relevant substances that are already present in the environment. These are present from various sources, such as industrial processes, commercial and domestic activities, traffic and natural sources.

5.4.3 A desk-based review of a number of data sources has been undertaken to determine baseline conditions of air quality in this assessment (Appendix B3). A review of local air quality monitoring data for recent years and local background pollutant concentrations has also been carried out.

5.4.4 Local air quality and the main sources of air pollution are outlined in Appendix B3.

Assessment extent

5.4.5 The study area for the construction and operational traffic assessment was determined using the Environmental Protection UK (EPUK)/Institute of Air Quality Management (IAQM) land-use guidance[12] screening criteria.

5.4.6 Since the WCC and neighbouring boroughs (including the London Borough of Lambeth (LBL), the London Borough of Wandsworth (LBW) and the Royal Borough of Kensington and Chelsea (RBKC)) have declared their whole boroughs as Air Quality Management Areas (AQMAs), the EPUK/IAQM criteria for sites located within AQMA were used to screen changes to traffic flows. The screening criteria are as follows:

- A change of Light Duty Vehicle[13] (LDV) flows of more than 100 Annual Average Daily Traffic (AADT) movements; and
- A change of Heavy-Duty Vehicle (HDV) flows of more than 25 AADT movements.

5.4.7 Meeting either of these criteria indicates that detailed dispersion modelling of the road traffic emissions is necessary.

5.4.8 Traffic flows exceeded the screening criteria for both the construction and operational assessment. Therefore, detailed dispersion modelling has been carried out for both the construction and operation assessment. Details of the modelled road networks and traffic data are provided in Appendix B4.

Sensitive receptors

5.4.9 A desk-top study was undertaken to identify the human and ecological sensitive receptors at and around the Proposed Development. Receptors were chosen at locations where they are likely to experience the greatest potential effect from the construction and/or operation of the Proposed Development. There were no sensitive ecological receptors in the vicinity of the Proposed Development therefore no ecological receptors were assessed.

5.4.10 A full list of the receptors used in the construction and operational assessment is provided in Appendix B4. Worst case receptor locations have been assessed in each phase in accordance with Parameter Plan EBE-AST-XX-XX-DR-A-011102.

Future baseline

5.4.11 Traffic increases in the opening year and as a result of other committed developments have been included in the traffic data and are therefore inherently part of the air quality assessment.

[12] Moorcroft and Barrowcliffe. et al. (2017) Land-use Planning & Development Control: Planning for Air Quality. v1.2. Institute of Air Quality Management, London, http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf
[13] Cars and small vans <3.5tonne gross vehicle weight

Construction effects

Construction activities

5.4.12 The potential impacts that may arise as a result of demolition and construction works for the Proposed Development are dust deposition, resulting in the soiling of surfaces; visible dust plumes; elevated PM_{10} and $PM_{2.5}$ concentrations as a result of dust generating activities onsite; and an increase in nitrogen dioxide (NO_2), particulate matter (PM_{10}) and fine particulate matter ($PM_{2.5}$) concentrations due to exhaust emissions from Non-Road Mobile Machinery (NRMM).

5.4.13 As defined in the scoping report, an assessment of construction activities onsite is likely to result in a classification of high risk. This is due to the site being assessed against the Institute of Air Quality Management (IAQM)[14] and Greater London Authority (GLA) guidance. Mitigation would be assumed for high risk sites as a conservative approach. The high risk classification takes into account the impact from the Prior Approval demolition and the multiple phases as this is a worst case assumption.

5.4.14 Mitigation measures applicable to high risk sites outlined in the IAQM guidance[14] and GLA's The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance (SPG)[15] would be employed as a best practice measure. According to the guidance, on the assumption that the mitigation measures are appropriately implemented, the residual effect would normally be 'not significant'. This is considered to be the case, even with regards to the phased approach to the site (and inclusive of the demolition of those buildings subject to demolition under the Prior Approval Application (Application Ref: 19/06951/APAD)). On this basis, an assessment of effects from construction dust has been scoped out. Site-specific mitigation would align with the council's own Code of Construction Practice[16].

5.4.15 In addition, the emissions from NRMM have also been scoped out, as it is assumed that all NRMM would meet the relevant emissions standards as detailed in the aforementioned GLA construction SPG[15] and consequently the emissions would not give rise to likely significant effects on local air quality.

Construction traffic

5.4.16 Construction impacts could arise because of traffic changes on the local road network.

5.4.17 The methodology for the assessment of construction traffic effects is given in Appendix B4 including how significance within the assessment was determined.

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[14] Holman et al (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf

[15] Greater London Authority, 2014. The Control of Dust and Emissions during Construction and Demolition SPG. https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/Dust%20and%20Emissions%20SPG%208%20July%202014_0.pdf

[16] City of Westminster (2016). Code of Construction Practice. https://www.westminster.gov.uk/sites/default/files/code_of_construction_practice_2016_v1.1_4.pdf

Construction traffic data includes vehicles associated with the demolition of blocks under the Prior Approval Application.

Operational effects

5.4.18 Operational impacts can arise as a result of traffic changes on the local road network. The operational traffic was screened against the criteria set out in 5.4.6 and detailed dispersion modelling was undertaken.

5.4.19 The methodology for the assessment of operational effects is given in Appendix B4.

Cumulative effects

5.4.20 Cumulative effects have been taken into account throughout the air quality assessment by including traffic flows from committed developments, in addition to the traffic data associated with the Proposed Development.

5.5 Assumptions and limitations

5.5.1 It was assumed that the Proposed Development would result in high risk construction dust impacts and that accompanying high risk mitigation measures would be required to prevent these. The mitigation measures required are detailed in the draft CMP.

5.5.2 Air quality dispersion modelling has inherent limitations and areas of uncertainty, which are detailed in Appendix B5.

5.5.3 The methodology proposed for this assessment is designed to provide a robust assessment, reducing uncertainty caused by the above limitations.

5.6 Baseline

Sources of air pollution

Industrial processes

5.6.1 Industrial air pollution sources are regulated through a system of operating permits or authorisations, requiring stringent emission limits to be met, and ensuring that any releases to the environment are minimised or rendered harmless. Regulated (or prescribed) industrial processes are classified as Part A or Part B processes and are regulated through the Pollution Prevention and Control (PPC) system[17,18]. The larger, more polluting processes are regulated by the Environment Agency (EA), and the smaller, less polluting ones by the local authorities. Local authorities focus on regulation for emissions to air, whereas the EA regulates emissions to air, water and land.

[17] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)
[18] The Environmental Permitting (England and Wales) (Amendment) Regulations 2013, SI 2013/390.

5.6.2 There are no Part A processes with releases to air relevant to this assessment within 3km of the Proposed Development listed on the EA website[19].

5.6.3 Any impact of emissions from other Part A or Part B processes further away from the site are assumed to be represented in the Defra background concentrations used, and therefore have been taken into account in the assessment.

Rail

5.6.4 The Proposed Development is directly adjacent to the rail lines that lead to Victoria Station. However, Defra's Local Air Quality Management Guidance (TG16)[20] does not highlight this route as one subject to heavy use of diesel trains. As such, rail emissions are not a key pollution source for the area and would not have a significant impact on air quality at the Proposed Development.

Road

5.6.5 The main source of pollutant emissions for the area is road traffic emissions. The site is bound to the west by Ebury Bridge Road and is close to the A3212 Grosvenor Road, the A3216 Queenstown Road and the A3214 Pimlico Road.

5.6.6 It should be noted that Ebury Bridge Road is currently a street canyon. Dispersion can be impacted in a street canyon, such as increasing concentrations therefore street canyon effects have been included in the detailed dispersion modelling.

Local air quality

Air Quality Management Areas

5.6.7 A review of the Defra website[21] showed that the WCC declared the whole borough as an AQMA in 1999. This was due to exceedances of the annual mean NO_2 objective (40µg/m^3) and the annual and daily mean PM_{10} objectives (40µg/m^3 and 50µg/m^3, not to be exceeded more than 35 times a year respectively). This is known as the Westminster AQMA and is shown in Appendix B3 Figure 1.

5.6.8 There are also three other AQMAs within 2km of the Proposed Development. LBL, LBW and RBKC have also declared borough-wide AQMAs. Details of these AQMAs and their locations are also shown in Appendix B3.

Local monitoring

5.6.9 Due to the proximity of the scheme to the LBL, LBW and RBKC, monitoring data from these local authorities has also been considered.

[19] Environment Agency website. https://environment.data.gov.uk/public-register/view/search-industrial-installations
[20] Defra, 2016. Local Air Quality Management Technical Guidance (TG16), https://laqm.defra.gov.uk/technical-guidance/
[21] Defra, 2016. Air quality management areas. http://uk-air.defra.gov.uk/aqma/list

5.6.10 Both continuous automatic monitoring and passive diffusion tube monitoring are undertaken by the LBL, LBW and RBKC. The WCC undertake automatic monitoring only.

5.6.11 Within 2km of the Proposed Development, there are five automatic monitoring locations and 13 diffusion tubes, which are discussed in the following sections. Details of these sites and monitored concentrations are presented in Appendix B3.

Automatic monitoring

5.6.12 The local authority automatic monitoring in the vicinity of the Proposed Development is summarised in Table 9.

5.6.13 The urban background monitoring site reported in the WCC Annual Status Report[22] (ASR) (Horseferry Road) recorded an exceedance of the annual mean NO_2 Air Quality Objective (AQO) in 2014 with concentrations falling between 2015 to 2018. Concentrations in 2018 were below the AQO (31.0µg/m^3). This site is located approximately 1.2km north-east of the Proposed Development.

5.6.14 The data in Table 9 show that concentrations of annual mean NO_2 close to the main roads in the area typically exceed the AQO. Concentrations of NO_2 within the development site itself (such as courtyards areas) would probably be below the AQO, and similar to the concentrations recorded at the Horseferry Road site due to the distance from the road and the barrier to vehicle emissions created by the building.

Table 9: Monitored concentrations of NO_2 at automatic sites

ID	X	Y	Annual mean NO_2 concentrations (µg/m^3)				
			2014	2015	2016	2017	2018
Horseferry Road	529778	178960	46.0	39.0	37.0	36.0	31.0
WAA	529137	177249	47.0	40.0	40.0	33.0	-
KC3	527516	179395	72.0	71.0	80.0	66.0	62.8
KC4	527267	178089	76.0	73.0	78.0	63.0	50.4
KC1	524045	181752	34.0	32.0	35.0	33.0	29.1
LB5	530317	177952	71.0	75.0	65.0	61.0	51.1.0
Air quality objective			40µg/m^3				
"-" denotes that the data is not available yet Exceedances of the air quality objective are denoted in bold							

5.6.15 Details and locations of these automatic monitoring sites are shown in Appendix B3.

[22] Westminster City Council Air Quality Annual Status Report for 2018, City of Westminster (2019)

Diffusion tube monitoring

5.6.16 The local authority diffusion tube monitoring in the vicinity of the Proposed Development is summarised in Table 10.

Table 10: Monitored concentrations of NO_2 at diffusion tube sites

ID	X	Y	Annual mean NO_2 concentrations (µg/m^3)				
			2014	2015	2016	2017	2018
W3	528866	177024	60.0	57.0	63.0	Site closed	Site closed
W33	528871	176943	N/A	N/A	N/A	36.0	34.0
KC34	527164	178103	45.1	40.8	43.7	43.7	39.0
KC44	527335	178810	40.0	39.6	46.1	41.0	35.5
KC48	258011	178675	73.9	63.0	72.3	71.8	57.2
KC49	527516	179395	74.5	69.7	87.5	*	*
KC50	527726	177727	59.4	48.2	56.4	52.7	40.3
KC51	527690	177800	33.3	31.6	36.2	39.5	27.7
KC52	527411	178659	58.4	52.9	64.5	56.1	45.1
KC56	527268	178089	74.4	63.7	72.7	68.0	50.9
KC57	527889	179145	54.4	43.6	56.2	57.2	39.8
KC68	525630	179674	52.9	44.6	51.0	51.9	40.9
Air quality objective			40µg/m^3				

Notes:
Exceedances are shown in bold
NA/ indicates that the site was not yet open
* Data capture below 25%
Exceedances of the air quality objective are denoted in bold

5.6.17 Details and locations of these diffusion tube sites are shown in Appendix B3.

Defra background concentrations

5.6.18 The Defra website[23] includes estimated background concentrations for NO_2, NO_x, PM_{10} and $PM_{2.5}$ for each 1km by 1km Ordnance Survey (OS) grid square. The estimated Defra background concentrations for the OS grid squares containing the Proposed Development are provided in Appendix B3.

5.6.19 Analysis regarding the suitability of the Defra background concentrations for this assessment are also provided in Appendix B3, including a comparison with monitored urban background concentrations. The Defra background concentrations are used in this assessment.

[23] Defra background mapping data for local authorities. http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

London Atmospheric Emissions Inventory

5.6.20 The London Atmospheric Emissions Inventory (LAEI)[24] provides emissions estimates of key pollutants by source type and the current base year of the data is 2016. Much of the Proposed Development is within the 40-45µg/m^3 and 45-50µg/m^3 brackets for NO_2 for the LAEI baseline year 2016. A map of the LAEI data is shown in Appendix B3.

5.7 Embedded and good practice measures

5.7.1 It has been assumed that the Proposed Development would be a high risk site in terms of construction dust risk to human health and dust soiling. In light of this assumption, the best practice mitigation measures described in the IAQM construction dust guidance[14] and GLA guidance[15] for high risk sites are essential to avoid significant effects occurring. These measures are included in the draft CMP.

5.7.2 There are a range of embedded mitigation measures outlined in the Travel Plan (Ref: EBR-08) which would improve air quality. These include:

- Prioritisation of pedestrian and cycle movement throughout the Proposed Development;
- Access to cycle parking storage facilities in the site, including 1,370 long stay and 162 short stay cycle spaces;
- It is proposed that the Proposed Development would be 'car-lite', with only disabled parking being provided (a total of 42 spaces). Active electric vehicle charging points for 50% of these spaces would be provided
- Space on site would be safeguarded for a TfL cycle hire docking station on the southern part of the site; and
- The Proposed Development is located close to public transport including nine bus routes within a 640m walk of the site.

5.8 Assessment

Model verification

5.8.1 Air quality monitoring location RBKC diffusion tube KC57 has been modelled as a receptor for inclusion in the baseline detailed dispersion model for model verification purposes only. The results of the verification are presented in Appendix B7.

Construction traffic effects

5.8.2 The predicted concentrations (NO_2, PM_{10} and $PM_{2.5}$) from the assessment of construction traffic are presented in Appendix B8.

[24] LAEI, 2016. London Atmospheric Emissions 2016. https://data.london.gov.uk/dataset/london-atmospheric-emissions-inventory--laei--2016

5.8.3 Predicted NO_2 concentrations at existing receptors are generally high or exceeding the national AQO (40µg/m^3) for both the Do Minimum (DM) and Do Something (DS) modelled scenarios. This is expected in the area since the local authority has declared the entire borough as an AQMA for exceedances of the annual mean NO_2 AQO.

5.8.4 The largest change (0.2µg/m^3) due to the construction of the Proposed Development was predicted at four receptors (C1, C4, C5 and C12). The modelled heights of each receptor were C1 (1.5m), C4 (1.5m), C5 (1.5m) and C12 (1 and 4.5m). The NO_2 concentration exceeded or was close to exceeding the objective at all of these locations in the Base, DM and DS scenarios at these receptors.

5.8.5 A moderate adverse impact has been predicted at receptor locations C1, C5 and C12 at modelled heights of 1.5m, 1.5m and 1m respectively. C1 is located along Ebury Bridge Road (Wellington Buildings) and is predicted to increase from 44.5µg/m^3 in the DM to 44.7µg/m^3 in the DS scenario. C5 is located on the corner of Ebury Bridge Road and Ebury Bridge and is predicted to increase from 41.2µg/m^3 in the DM to 41.4µg/m^3 in the DS scenario. C12 is located on the corner of Chelsea Bridge Road and is predicted to increase from 46.8µg/m^3 in the DM to 47.0µg/m^3 in the DS scenario. A change of 0.2µg/m^3 was predicted at all of these locations.

5.8.6 There is a slight adverse impact predicted at receptor locations C4 (1.5m) and C12 (4.5m). C4 is located along Ebury Bridge Road (by Ranelagh Cottages) and is predicted to increase from 39.1µg/m^3 in the DM to 39.3µg/m^3 in the DS scenario. C12 is located on the corner of Chelsea Bridge Road and is predicted to increase from 40.3µg/m^3 in the DM to 40.5µg/m^3 in the DS scenario. A change of 0.2µg/m^3 was predicted at both receptors.

5.8.7 The highest concentration predicted in the DS scenario was at receptor C9, which is located along Buckingham Palace Road and is predicted to increase from 52.4µg/m^3 in the DM to 52.5µg/m^3 in the DS scenario.

5.8.8 The impacts at these receptors are due to a combination of the very high baseline concentration and a relatively small increase in annual mean NO_2 concentrations attributable to emissions from the construction vehicles.

5.8.9 It should be noted that the construction assessment is based on the worst case 12-month average of daily traffic flows, rather than those averaged out over the construction phases (to provide a conservative assessment) so these impacts are unlikely to be present for the entirety of the construction period.

5.8.10 In addition to the use of peak construction vehicle movements, the assessment was also based on other conservative modelling parameters, including the use of emission factors and background concentration based on 2018 baseline year, assuming that there would not be any improvement in vehicle emissions between baseline and the start of the construction phases. In reality, there should be an improvement, especially due to the introduction of the Ultra Low Emission Zone (ULEZ) in London in April 2019, and the proposed extended ULEZ (including the A406) by October 2020.

5.8.11 All other receptors are predicted have a negligible impact for NO_2.

PM_{10} concentrations

5.8.12 The predicted annual mean concentrations of PM_{10} for the construction scenario at each receptor are given in Appendix B8. The PM_{10} concentrations at all receptors are well below the annual mean AQO (40µg/m^3) with a change in concentration due to the construction of the Proposed Development of 0.1µg/m^3 or less.

5.8.13 The highest concentration (including background concentrations) of PM_{10} due to the construction of the Proposed Development is at receptor C9. At this location (Buckingham Palace Road) a concentration of 20.6µg/m^3 was predicted in the Baseline, DM and DS scenarios.

$PM_{2.5}$ concentrations

5.8.14 The predicted annual mean concentrations of $PM_{2.5}$ for the construction scenario at each receptor are given in Appendix B8. The predicted $PM_{2.5}$ concentrations are well below the annual mean AQO (25µg/m^3) at all receptors for the construction scenario, with a change in concentration due to the Proposed Development of 0.1µg/m^3 or less.

5.8.15 The greatest concentration of $PM_{2.5}$ due to the construction of the Proposed Development was predicted at receptor C9. At this location (Buckingham Palace Road) a concentration of 13.7µg/m^3 was predicted in the Baseline, DM and DS scenarios.

Overall effect

5.8.16 The air quality assessment considers the impacts and significance of effects that the Proposed Development would have on all receptors together. This approach has been used here to determine the overall significance.

5.8.17 The effect of the construction traffic associated with the Proposed Development on these receptors can be considered **not significant** due to the conservative assumptions used and the small number of slight and moderate adverse impacts predicted.

Existence effects

5.8.18 No assessment of existence effects has been undertaken in this air quality assessment.

Operational effects

5.8.19 The predicted concentrations from the assessment of operational traffic are presented in Appendix B9.

5.8.20 Exceedances of the annual mean NO_2 AQO are predicted at 18 of the 94 sensitive receptors modelled with the operation of the Proposed Development in 2028. NO_2 concentrations at all of these receptors exceeded the annual mean NO_2 objective without the Proposed Development.

5.8.21 The highest concentration of annual mean NO_2 in 2028 was predicted at receptor H5 at a modelled height of 1.5m. This existing residential receptor is located on the corner of Ebury Bridge Road and Ebury Bridge. This receptor has a predicted concentration of 51.0µg/m^3, 51.2µg/m^3 and 51.3µg/m^3 for the 2018 Baseline, 2028 DM and 2028 DS scenarios respectively.

5.8.22 The largest change (0.2µg/m^3) due to operation of the Proposed Development was predicted at two receptors (H1 and H15) at modelled heights of 1.5m. The NO_2 concentration exceeded the AQO (40µg/m^3) at both of these locations in the Baseline, DM and DS scenarios so no new exceedances are created at these receptors. These are the only two receptors that do not have a negligible impact due to the operation of the Proposed Development. H1 has a moderate adverse and H15 a slight adverse impact.

5.8.23 The moderate adverse impact has been predicted at receptor H1 at a modelled height of 1.5m. H1 is an existing receptor, located on Ebury Bridge Road (Wellington Buildings) and is predicted to increase from 42.6µg/m^3 in the DM to 42.8µg/m^3 in the DS scenario.

5.8.24 The slight adverse impact has been predicted at receptor H15 at a modelled height of 1.5m. H15 is located at the northern most point of Chelsea Barracks, along Ebury Bridge Road, and is predicted to increase from 40.5µg/m^3 in the DM to 40.7µg/m^3 in the DS scenario.

5.8.25 The impacts at these receptors are due to a combination of the very high baseline concentration and a relatively small increase (0.2µg/m^3) in annual mean NO_2 concentrations attributable to emissions from the increase in operational traffic.

5.8.26 As with the construction assessment, the assessment was based on conservative modelling parameters, including the use of emission factors and background concentration based on 2018 baseline year, assuming that there would not be any improvement in vehicle emissions between baseline and the year of operation. In reality, there should be an improvement, especially due to the introduction of the Ultra Low Emission Zone (ULEZ) in London in April 2019, and the proposed extended ULEZ (including the A406) by October 2020.

5.8.27 All other receptors are predicted to have a negligible impact.

5.8.28 Receptors FH1, FH2, FH3 and FH4 are future receptors modelled at the Proposed Development. Exceedances of the annual mean NO_2 objective (40µg/m^3) are predicted at 4 out of these 32 future receptor heights modelled, with a maximum predicted concentration (45.6µg/m^3) at FH3 at a modelled height of 1.5m. All of these exceedances were predicted at a height of 1.5m in the 2028 DM and DS scenarios for annual mean NO_2.

5.8.29 At the time of writing receptor locations FH1, FH2 and FH4 are planned to be non-residential until the first floor and FH3 until the third floor of the Proposed Development. At modelled heights higher than 1.5m there were no exceedances of the AQO predicted, with all impacts predicted to be negligible.

5.8.30 The receptor locations that are exceeding are all retail and therefore the short term AQO is considered. All receptors modelled were at worst case locations, none of the receptors including FH1, FH2 and FH4 predicted NO_2 concentrations over

60µg/m^3. This indicates, based on Defra's Local Air Quality Management Guidance (TG16)[20], there is not a potential for an exceedance of the NO_2 hourly mean air quality standard in addition to the annual mean standard at these receptor locations.

PM_{10} concentrations

5.8.31 The predicted annual mean concentrations of PM_{10} for the operational scenario at each receptor are given in Appendix B9. The PM_{10} concentrations at all receptors are well below the annual mean AQO (40µg/m^3) with a change in concentration due to the operation of the Proposed Development of 0.1µg/m^3 or less.

5.8.32 The highest concentration (including background concentrations) of PM_{10} in the Base, DM and DS operational scenarios was predicted at receptors H5 and H16. Receptor H5 is an existing residential property on the corner of Ebury Bridge Road and Ebury Bridge and H16 is St Barnabas Primary School. At these locations a concentration of 20.3µg/m^3 was predicted in the Baseline, DM and DS scenarios.

5.8.33 All receptors have a negligible impact with the operation of the Proposed Development in 2028. There are no exceedances of the annual mean PM_{10} objective at future receptor locations.

$PM_{2.5}$ concentrations

5.8.34 The predicted annual mean concentrations of $PM_{2.5}$ for the operational scenario at each receptor are given in Appendix B9. The $PM_{2.5}$ concentrations at all receptors are predicted to be well below the annual mean AQO (25µg/m^3) with a change in concentration due to the operation of the Proposed Development of 0.1µg/m^3 or less.

5.8.35 The highest concentration (including background concentrations) of $PM_{2.5}$ in the Base, DM and DS scenarios was predicted at receptors H5 and H16 at a height of 1.5m. At these locations a concentration of 13.6µg/m^3 was predicted in the all scenarios.

5.8.36 All receptors have a negligible impact with the operation of the Proposed Development in 2028. There are no exceedances of the annual mean $PM_{2.5}$ objective at future receptor locations.

Overall effect

5.8.37 The air quality assessment considers the impacts and significance of effects that the Proposed Development would have on all receptors together. This approach has been used here to determine the overall significance.

5.8.38 The effect of the operational traffic associated with the Proposed Development on these receptors was considered to be **not significant** due to the conservative assumptions used and the small number of slight and moderate adverse impacts predicted.

Air Quality Neutral

5.8.39 The AQN assessment results are described in detail in Appendix B10.

5.8.40 The AQN benchmarks for the development have been calculated and compared with the planned emissions.

5.8.41 The total development trip rates and total transport emissions for the land-use classes in the Proposed Development are within the relevant total traffic emissions benchmarks.

5.8.42 Overall, it was considered that the AQN assessment complies with the AQN policy and indicates that no further mitigation is required.

5.9 Additional mitigation

5.9.1 No additional mitigation is required.

In-combination climate change impacts

5.9.2 The future climate conditions have been reviewed as part of the assessment, including changes to long term seasonal averages and extreme weather events as projected by the UK Climate Projections 2018.

5.9.3 Potential effects which could arise due to air quality impacts from the Proposed Development in combination with future projected climate conditions on air quality receptors include the following:

- An increase in hotter and drier conditions and increased frequency of droughts and heatwaves could exacerbate dust generation during construction. High risk mitigation measures have already been included in the CMP to limit the generation and dispersion of construction dust. This climate change effect would therefore not affect the significance of the air quality assessment.
- Increased wind speed could influence dispersion of pollutants during construction and operation. There is considerable uncertainty in projecting wind changes, from wind speed to wind direction, and studies show statistically insignificant variation in wind speed. High risk mitigation will already be included in the CMP which would mitigate any further impacts due to climate change impacts.
- An increase in hotter and drier conditions could increase concentrations of air pollutants such as ozone and NOx. Vehicle emissions are predicted to reduce and therefore the consequence of this impact is low and it would not affect the significance of the air quality assessment.
- Increased frequency and intensity of heavy rainfall events and flooding could reduce dust and pollutant concentrations due to wet deposition. This climate change effect would therefore not affect the significance of the air quality assessment.

5.9.4 While the impacts of climate change are likely to affect air quality in general terms, no significant in-combination effects with the scheme have been identified and no mitigation is proposed.

5.10 Residual effects

Construction effects

5.10.1 No additional mitigation has been proposed with respect to construction air quality effects. As such, the effects would be as reported in Section 5.8.

Existence effects

5.10.2 No existence effects have been identified in the air quality assessment and therefore no mitigation is required.

Operational effects

5.10.3 No additional mitigation is required with respect to operational air quality effects. As such, the effects would be as reported in Section 5.8.

5.11 Cumulative effects

5.11.1 The list of developments identified for assessing cumulative effects is presented as Appendix A.

5.11.2 The Air Quality assessment is inherently cumulative, as the traffic data used throughout (for both construction and operational traffic assessments) includes traffic from committed developments. The committed developments included in the assessment are determined by the transport team. The assessment results presented in sections 5.8 to 5.10 include consideration of the developments identified in Appendix A5. No further cumulative assessment is therefore required in relation to Air Quality.

5.12 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Sensitive human receptors	Increased dust production during the construction phase effecting human health and dust soiling (medium-term)	High risk in terms of construction dust risk to human health and dust soiling however managed by high risk mitigation included in the CoCP	Not significant	No significant adverse effects therefore no additional mitigation required	Not significant	Not significant
Sensitive human receptors	Increased NO_2, PM_{10} and $PM_{2.5}$ concentrations from construction traffic emissions (medium-term)	Negligible to moderate adverse	Not significant	No significant adverse effects therefore no additional mitigation required	Not significant	Not significant
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Scoped out						
Use/Operation – effects arising from the use of the development						
Sensitive human receptors	Increased NO_2, PM_{10} and $PM_{2.5}$ concentrations from operational traffic emissions (long-term)	Negligible to moderate adverse	Not significant	No significant adverse effects therefore no additional mitigation required	Not significant	Not significant
Sensitive human receptors	Emissions from vehicle trips associated with the Proposed Development (long-term)	Negligible as emissions are within AQN benchmarks	Not significant	No significant adverse effects therefore no additional mitigation required	Not significant	Not significant
Sensitive human receptors	Combustion plant emissions	*Scoped out*				
Sensitive human receptors	Rail emissions	*Scoped out*				

6 Archaeology

6.1 Introduction

6.1.1 This section describes the likely significant effects of the Proposed Development on archaeology. It outlines the methodology, the baseline conditions and the likely significant archaeological effects associated with the construction, existence and operation of the Proposed Development. Mitigation measures which would be implemented to reduce the effects of the Proposed Development on archaeology are also described, where relevant.

6.2 Scope of the assessment

6.2.1 The proposed scope for the assessment of archaeology is summarised in Table 11.

Table 11: Archaeology scope

Assessment	Construction	Existence	Operation
Archaeology	✓	✓	n/a
Buried geoarchaeology (palaeo-environmental remains)	✓	✓	n/a

6.2.2 A Scoping Opinion was received from Westminster City Council on 6 December 2019. This included one comment relating to archaeology. Responses to these comments are detailed in Appendix A3. In summary, a desk-based assessment of heritage assets was requested. An assessment of the buried archaeological remains on the site has been prepared and is included at Appendix C2 of this ES. An assessment of the potential impacts on above ground heritage assets is included in the heritage, townscape and visual impact assessment in Volume 2 of the ES.

6.3 Consultation

6.3.1 Historic England's Greater London Archaeological Advisory Service (GLAAS were provided with a copy of the desk-based assessment of archaeological remains and a copy of a Written Scheme of Investigation prepared in respect of an archaeological watching brief on site investigation works. In an e-mail response dated 15 April 2020 Historic England advised that both documents should be formally submitted for consultation through WCC, along with a report on the watching brief observations when available.

6.3.2 Historic England also noted that the assessment should consider the likelihood of alterations to drainage patterns that might lead to decomposition or destruction of below ground archaeological remains and deposits and can also lead to subsidence of buildings and monuments. Groundwater conditions have been considered in the archaeological desk based assessment and the ground investigation report will confirm water conditions on site.[25]

[25] Restrictions on site work as a result of Covid 19 have delayed the production of this report.

6.3.3 In addition, Historic England noted that an archaeological mitigation strategy, informed by the results of the watching brief, should be submitted in support of any planning application.

6.4 Methodology

Overview

6.4.1 This section outlines the methodology for assessing the likely significant effects on archaeology from the demolition, construction and existence of the Proposed Development.

Baseline methodology

6.4.2 The assessment of the baseline conditions has been undertaken using readily available information, including records from archaeological investigations, historical data, and historic mapping. This included a search of the Greater London Historic Environment Record (GLHER) within a 500m radius around the site, henceforth referred to as the study area. This is based upon professional judgement, and in line with guidance from GLAAS. This study area is considered appropriate for the assessment for all phases of effects.

6.4.3 There is the potential for previously unknown archaeological assets to be encountered on the site, based on an understanding of site formation processes, urban growth and historic impacts in the area.

6.4.4 An archaeological watching brief was undertaken on site investigation works between March and May 2020. The results of the watching brief can be found at Appendix C2 These observations have informed the archaeological mitigation strategy (see Appendix C3).

6.4.5 Known and potential archaeological assets were assessed using key factors:

- Their location in relation to the Proposed Development;
- The significance of the assets, based on specified defining values; and
- The anticipated impact of the Proposed Development upon the assets.

Construction effects

6.4.6 Construction effects associated with the Proposed Development have been assessed by applying the following approach, based upon relevant guidance[26] and professional judgement:

- Identification of known baseline archaeological assets;
- Assessment of the significance of baseline archaeological assets;

[26] Historic England (2015) Guidelines for Archaeological Projects in Greater London, GLAAS Guidance Paper and Chartered Institute for Archaeologists (2017) Standard and guidance for historic environment desk-based assessment.

- Identification and assessment of the magnitude of impact as a result of the Proposed Development, and the level of the associated effect; and
- Identification of any residual effects upon the significance of assets, taking into account proposed mitigation.

Existence effects

6.4.7 Existence effects associated with the Proposed Development on archaeological assets have been assessed using the same approach set out in paragraph 6.4.6.

Operational effects

6.4.8 Operational effects have been scoped out for archaeology, as effects would occur as a result of the existence of the Proposed Development, and no new effects would occur during operation.

Cumulative effects

6.4.9 The list of developments identified for assessing cumulative effects upon identified and potential archaeological assets is presented in paragraph 1.11. The potential for cumulative effects with each of these developments is examined, and an assessment based on relevant guidance and professional judgement presented.

6.5 Assumptions and limitations

6.5.1 The following assumptions have been made:

- information supplied by GLHER to inform the baseline assessment is complete and correct; and
- unless evidence to the contrary exists, it has been assumed that archaeological remains identified as potentially present on the site are actually present and survive to an extent which means that they retain more than negligible value.
- demolition under prior approval will comprise removal of the existing buildings to slab level. Demolition will therefore not have an impact on archaeological remains and is therefore excluded from this assessment.

6.5.2 The following limitations have potential to affect the robustness of the assessment:

- the availability and quality of borehole data may limit the accuracy of the deposit model;
- the availability and accuracy of early mapping may limit the robustness of the baseline assessment in respect of the Chelsea Waterworks and associated features; and
- the robustness of the baseline assessment of archaeological survival on the site has been limited by the lack/restricted nature of archaeological site investigation works.

6.6 Baseline

6.6.1 A desk-based assessment has been undertaken using existing available records to determine, as far as is reasonably practicable, the nature, extent and significance of the historic environment on the site and within a 500m study area. A summary of the baseline data from the desk-based assessment is provided below. The full assessment can be found in Appendix C2.

Topography and palaeoenvironment

6.6.2 The landscape of Westminster in the prehistoric period was very different to what is seen today. The River Thames was much wider and shallower than it is today, and its tidal nature meant that the adjacent floodplains were continually inundated.

6.6.3 The site lies within an inside bend of the River Thames, which is approximately 300m to the south of the site. This would have led to the creation of abraded channels between the locations of Waterloo and Chelsea Bridges. It is understood that the main tract of the River Thames crossed the site in the post-Ipswichian period.

6.6.4 Tyburn and Westbourne rivers previously flowed through the floodplain, creating great marshes and fens. Areas of higher ground, known as eyots, existed within this marshy landscape. The site lies in what would have been the delta formed by the prior alignments of the two rivers, in low-lying and marshy land.

6.6.5 After the diversion of the Westbourne away from the site, the Tyburn was diverted to pass through the site in order to keep a marshland environment for use as osier beds where willows were cultivated for basket making.

Prehistory (400,000 BC to AD 43)

6.6.6 The Palaeolithic period (400,000 to 10,000 BC) saw the presence of hominids within the region of London, with evidence of stone tools recovered from this period. Around 40,000 BC modern humans arrived in the Thames Valley, though occupation appears to have been intermittent as a potential response to the glacial and interglacial periods. Whilst evidence from this period has been recorded in west London and the vicinity of Trafalgar Square, no Palaeolithic evidence has been recorded within the study area. If present, evidence from this period would be anticipated to be in the form of stray artefacts typically in the form of flint tools or environmental evidence within the terrace gravels.

6.6.7 During the Mesolithic period (10,000 to 4,500 BC) Britain was permanently inhabited, with small, temporary camps near water sources, with settlement evidence recorded upstream along the Thames. However, no evidence from this period has been recorded upon the site. If present, evidence is likely to be in the form of environmental evidence or stray artefacts.

6.6.8 The Neolithic period (4,500 to 2,500 BC) saw the development of agriculture, a move towards permanent settlements in the Thames Valley, and the introduction of pottery. However, no large permanent settlement sites have as yet been found

within Westminster, and it has been suggested that it was potentially the site of only transitory activity.

6.6.9 There is evidence of the eyots in Westminster being utilised during the Bronze Age (2,500 BC to 800 BC) and Iron Age (800 BC to AD 43). Wooden trackways plough marks have been encountered, along with drainage and boundary ditches, indicative of populations making use of the higher ground and the resources such locations provided.

Roman (AD 43 - 450)

6.6.10 During the Roman period the site would have lain in the agricultural hinterland to the west of Londinium. Two Roman roads are known to have existed in the Westminster area, with the closest to the site being that which connected Londinium to Silchester, following the line of the River Thames. This is approximately in line with modern Oxford Street and Theobalds Road. The area outside of Londinium was characterised by small settlements, with local markets, farms, and villas linked by smaller status roads. Although no Roman settlements are known from the Westminster area, a Roman field system has been identified in the region of Hyde Park.

Saxon to medieval (AD 450 - 1485)

6.6.11 There is limited evidence dating from the Saxon to medieval period within the study area. The middle Saxon settlement of Lundenwic was centred along the Strand, approximately 600m to the south-east of the study site, and smaller agrarian settlements are known to have existed in its hinterland. Ebury Manor, which was recorded in the Domesday Book, abuts the north of the site, and a road passing through Ebury manor towards Ebury farm also dates to this period.

Post-medieval to modern (AD 1485 - present)

6.6.12 During the post-medieval period (AD 1485 to 1700) the site would have lain in a landscape characterised by being a low-lying flood plain, situated within wealthy estates with land use being a range of informal agricultural and recreational uses. Seventeenth century mapping shows the site as part of the Ebury Estate, with a small waterway passing through the site.

6.6.13 The industrial period (AD 1700 to 1930) saw the construction of the Chelsea Water Works, elements of which were present within the site boundary, including the Grosvenor Canal and wharf buildings. The late 1920s saw the partial infilling of the canal and demolition of the wharf buildings, with the land becoming the Ebury Bridge Estate.

6.6.14 The conversion to residential usage continued into the modern period (AD 1930-2019), with further buildings forming the Ebury Bridge Estate being constructed upon the site.

Significance of remains present on the site

6.6.15 Borehole data and watching brief observations indicate that alluvial deposits are present on the site. These deposits are associated with the former courses of the rivers Westbourne and Tyburn. Those elements of the alluvial deposits which comprise clayey peats and silts from a waterlogged environment may be up to 4m deep. The deposits are likely to retain good assemblages of ecofacts for determining the natural environment.

6.6.16 Water channels connecting the Chelsea Waterworks to the reservoirs in Hyde Park and St James' Park may also be present on the site. The degree to which these features have survived truncation by later activities, such as the construction of the Grosvenor Canal with its associated wharf buildings and subsequently the construction of the Ebury Bridge Estate, is unknown.

6.6.17 Remains of the Grosvenor Canal and associated wharf buildings survive on the site. The Grosvenor Canal was located in the eastern part of the site and the wharf buildings on the western of the site.

6.6.18 Where the remains of these receptors survive sufficiently intact to be recorded and interpreted, they have potential to contribute to local research objectives and are therefore considered to be of Low Value.

6.7 Embedded and good practice measures

6.7.1 A mitigation strategy has been developed (see Appendix C3). This conforms to standard practices for a significant site development in Westminster and Greater London and reflects the standards and guidance issued by Historic England Greater London Archaeology Advisory Service (GLAAS)[27] and the Chartered Institute for Archaeologists (CIfA)[28].

6.7.2 The main elements of the mitigation strategy will comprise:

- phased consultation with GLAAS;
- a detailed mitigation design responding to development impacts and detailed engineering designs (Stage 4) and responding to the requirements of an Archaeological Planning Condition;
- integration of mitigation within the programme of site-based development activities;
- appointment of an Archaeological Contractor; and
- production and approval of an Archaeological Contractor's Written Scheme of Investigation (WSI), addressing both the site works programme and post site works programme resulting in the publication of significant archaeological results and discoveries.

[27] See note 1 above.
[28] Chartered Institute for Archaeologists (2020) Standard and guidance for archaeological field evaluation; Chartered Institute for Archaeologists (2020) Standard and guidance for an archaeological watching brief; and, Chartered Institute for Archaeologists (2014) Standard and guidance for archaeological excavation.

6.8 Assessment

Construction effects

6.8.1 Borehole data and watching brief observations indicate that alluvial deposits are present on the site. These deposits are associated with the former courses of the rivers Westbourne and Tyburn. Those elements of the alluvial deposits which comprise clayey peats and silts from a waterlogged environment may be up to 4m deep. The deposits are likely to retain good assemblages of ecofacts for determining the natural environment.

6.8.2 Water channels connecting the Chelsea Waterworks to the reservoirs in Hyde Park and St James' Park may also be present on the site. The degree to which these features have survived truncation by later activities, such as the construction of the Grosvenor Canal with its associated wharf buildings and subsequently the construction of the Ebury Bridge Estate, is unknown.

6.8.3 Remains of the Grosvenor Canal and associated wharf buildings survive on the site. The Grosvenor Canal was located in the eastern part of the site and the wharf buildings on the western of the site.

6.8.4 Where the remains of these receptors survive sufficiently intact to be recorded and interpreted, they have potential to contribute to local research objectives and are therefore considered to be of Low Value.

6.8.5 Probing for obstructions during the preparation of the site for construction may have an impact on palaeoenvironmental deposits. This impact would be the result of ground disturbance as the foundations and basements of the buildings of the Ebury Bridge Estate (and those of the Grosvenor Canal and associated wharfside buildings) are removed. In the absence of a deposit model the scale of the impact on surviving deposits cannot be certain. However, it is unlikely that site preparation would remove more than a relatively small proportion of the remaining deposits. This represents a minor impact resulting in a neutral or slight adverse effect. This would be a **non-significant adverse effect**.

6.8.6 Probing for obstructions during the preparation of the site for construction may also have an impact on remains of any surviving features associated with the Chelsea Waterworks, the Grosvenor Canal and associated wharf buildings.[29] This impact would be the result of ground disturbance as the foundations and basements of the buildings of the Ebury Bridge Estate are removed. It is unlikely that site preparation would remove all of the remains. This represents a moderate impact resulting in a slight adverse effect. This would be a **non-significant adverse effect**.

[29] The submitted design offsets the basement pile line in order to avoid the mass concrete structure of the former canal wall - Ebury Bridge Road Design and Access Statement Chapter 6 page 20. Construction effects on the canal structure derived from site preparation will be confined to localised breaking out of the canal bed. The canal wall will however be removed where it falls within the footprint of the basements of blocks 6, 7 and 8. This is assessed as an existence effect.

Existence effects

6.8.7 Additional impacts on archaeological remains of all kinds beyond those which have occurred during site preparation would be derived from excavation for utilities and basements and earth moving associated with landscaping.

6.8.8 In the case of palaeoenvironmental remains the principal impact would result from the excavation of basements beneath blocks 2 and 3 and 6-9.[30] In these areas it is likely that the full depth of alluvial deposits would be removed. Outside of the footprint of these basements only the upper parts of the deposits are likely to be affected by utility trenching and landscaping. These activities would result in a change in the ability to understand and appreciate the resource and its historical context and setting. This represents a moderate impact resulting in a slight adverse effect. This would be a **non-significant adverse effect**.

6.8.9 In the case of the Chelsea Waterworks channels excavation for basements under blocks 2 and 3 and 6-9 would result in the removal of the full depth of surviving deposits. Outside of the footprint of these basements utility trenching would remove further remains to their full depth. However, earth moving for landscaping is likely to affect only more superficial remains but would be more extensive than excavation for utilities. These activities would result in an appreciable change in the ability to understand and appreciate the resource and its historical context and setting. This represents a moderate impact resulting in a slight adverse effect. This would be a **non-significant adverse effect**.

6.8.10 In the case of the remains of the Grosvenor Canal and associated wharf buildings excavation for basements under blocks 6-9 would result in the removal of all remains above the formation level of the basements. Excavation for utilities and earth moving associated with landscaping are likely to affect only the upper part of the canal structure. Excavation for utilities may however result in the removal of the full depth of surviving remains of wharf buildings. Earth moving for landscaping is likely to affect only more superficial remains of wharf buildings but would be more extensive than excavation for utilities. In combination this would result in an appreciable change in the ability to understand and appreciate the resource and its historical context and setting. This would represent a moderate impact resulting in a slight adverse effect. This would be a **non-significant adverse effect**.

Operational effects

6.8.11 Operational effects on archaeological remains have been scoped out of this assessment.

6.9 Additional mitigation

6.9.1 No additional mitigation is proposed.

[30] The extent to which any changes to site hydrology might result in decomposition or destruction of deposits left in situ is at present unknown. In a worst-case scenario however it is unlikely that these deposits will be entirely destroyed or decompose and the resulting effect would therefore not be significant.

6.10 Residual effects

Construction effects

6.10.1 No mitigation has been proposed with respect to construction effects on archaeology. As such the effects would be as reported in Section 6.8

Existence effects

6.10.2 No mitigation has been proposed/is practicable with respect to existence effects related to archaeology. As such the effects would be as reported in Section 6.8.

Operational effects

6.10.3 Operational effects on archaeological remains have been scoped out of this assessment.

6.11 Cumulative effects

6.11.1 The list of developments identified for assessing cumulative effects is presented as Appendix A5. In Table 12Table 26 the potential for cumulative effects with each of these developments is examined and an assessment presented where appropriate.

Table 12: Archaeology cumulative effects

Development	Potential for significant cumulative effects	Comments
Thames Tideway Tunnel	No	No receptors in common.
Chelsea Barracks	No	No receptors in common
Battersea Power Station	No	Opposite side of the Thames. No receptors in common.
Cringle Dock Waste Transfer Station	No	Opposite side of the Thames. No receptors in common.
Cundy Street Quarter	No	No receptors in common.

6.12 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Palaeoenvironmental deposits	Minor impact from ground disturbance associated with probing for obstructions	Neutral or slight adverse	Non-significant	None required.	Non-significant	Not applicable
Chelsea Waterworks	Moderate impact from ground disturbance associated with probing for obstructions	Slight adverse	Non-significant	None required.	Non-significant	Not applicable
Wharf buildings associated with Grosvenor Canal	Moderate impact from ground disturbance associated with probing for obstructions	Slight adverse	Non-significant	None required.	Non-significant	Not applicable
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Palaeoenvironmental deposits	Moderate impact from basement excavation, utility trenching and landscaping	Slight adverse	Non-significant	None required.	Non-significant	Not applicable
Chelsea Waterworks	Moderate impact from basement excavation, utility trenching and landscaping	Slight adverse	Non-significant	None required.	Non-significant	Not applicable
Grosvenor Canal and wharf buildings	Moderate impact from basement excavation, utility trenching and landscaping	Slight adverse	Non-significant	None required.	Non-significant	Not applicable
Use/Operation – effects arising from the use of the development						
Scoped out						

7 Climate change

7.1 Introduction

7.1.1 This section describes the likely significant effects of the Proposed Development on greenhouse gas (GHG) emissions. It outlines the methodology, the baseline conditions and the likely significant GHG effects associated with the construction and operation of the Proposed Development. Mitigation measures which would be implemented to reduce the effect of the Proposed Development on GHG emissions are also described, where relevant.

7.2 Scope of the assessment

7.2.1 The scope of the assessment of GHG emissions is summarised in Table 13. The assessment accounts for GHG emissions associated with construction and operational phases of the Proposed Development. Existence effects have been scoped out of this assessment as there are no significant GHG emissions associated with works that enable the development to exist beyond the construction scope.

Table 13: GHG emissions assessment scope

Assessment scope	Construction	Existence	Operation
Manufacture and production of construction materials	✓	n/a	n/a
Construction and demolition site works	✓	n/a	n/a
Treatment and disposal of waste materials	×	n/a	×
Traffic emissions	✓	n/a	✓
Water consumption	×	n/a	×
Building energy consumption	n/a	n/a	✓

7.2.2 A Scoping Opinion was received from Westminster City Council on 6th December 2019. No comments were received on the scope of the GHG emissions assessment. Since then, the following changes to the scope have been made:

- Construction worker transport is now scoped into the assessment; and
- Construction worker accommodation includes site offices, site meeting rooms, toileting, changing, and canteen accommodation. Construction worker accommodation, including the manufacture and production of construction materials and the energy consumption required for this accommodation is now scoped out of the assessment. At this stage of design and planning, it is considered likely that where required, construction workers accommodation would be located within partially decanted flats within the site (prior to demolition). The use of partially-decanted buildings is recommended as these are connected to existing infrastructure which provides electricity, gas and data connectivity. and data served.

7.3 Consultation

7.3.1 No additional consultation relating to the GHG assessment was undertaken.

7.4 Methodology

Overview

7.4.1 This section outlines the methodology for assessing the likely significant effects of the Proposed Development on GHG emissions. British Standards (BS) EN 15804:2012+A2 2019[31] and BS EN 15978:2011[32] have been used to inform the scope and methodology of the GHG emissions assessment, each of which adopts a whole life cycle approach to undertaking GHG emissions assessments.

7.4.2 The IEMA guidance on assessing GHG Emissions and evaluating their significance[33] has also been used to inform the assessment. This guidance states 'in the absence of a defined quantitative threshold of GHG emissions, all GHG emissions can be deemed significant'. The IEMA guidance also provides a framework for ensuring a proportionate, good-practice approach to assessment is adopted.

7.4.3 GHG emissions are reported as the tonnes of carbon dioxide equivalent (tCO_2e). CO_2e refers to a common unit employed to compare the emissions from various GHGs (methane, ozone, nitrous oxide etc.) based on their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential. The adoption of CO_2e as the common metric, rather than CO_2, allows all GHGs to be included in the assessment and contextualised against local and national targets.

7.4.4 An operational design life of 50 years is assumed for the assessment, from 2028-2078.

7.4.5 Further details of the methodology, including how guidance has informed the assessment, and any relevant assumptions and limitations, are included in Appendix D1.

Baseline

7.4.6 The baseline GHG emissions assessment accounts for the impact of the existing operations on site in 2019. In October 2019, the site was partially decanted from 336 occupied homes to 137 occupied homes, and 846 m^2 of retail area. It is assumed that these uses result in GHG emissions predominantly from operational building energy consumption and operational traffic.

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[31] British Standards Institute, 2013. SE EN 15804+A2 2019. Available at: https://shop.bsigroup.com/ProductDetail/?pid=000000000030279721
[32] British Standards Institute (2011), BS EN 15978, Available at: https://shop.bsigroup.com/ProductDetail/?pid=000000000030367221
[33] IEMA (2017), Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance. Available at: https://www.iema.net/assets/newbuild/documents/IEMA%20GHG%20in%20EIA%20Guidance%20Document%20V4.pdf

7.4.7 To calculate the GHG emissions associated with building energy consumption, the current energy demand (MWh per year) associated with each flat on the existing site[34] was provided. To estimate the associated GHG emissions from the remaining 137 occupied homes, emissions factors from the Green Book Supplementary Guidance produced by BEIS[43] were used. This reflects the likely decarbonisation of the UK electricity grid from the current year up to and including 2100. Refer to Tables 1 to 3 in Appendix D1 for further information.

7.4.8 To calculate the GHG emissions associated with traffic emissions, information was taken from the London National Travel Survey data[35] and 2011 Census data[36] to deliver assumptions on the total number of trips, the purpose of the trip, the transport mode split and distance travelled to and from the site. The transport assessment highlighted four core trip purposes for the Baseline Year (2019) – residential trips, retail trips, community trips, and delivering and servicing trips. BEIS GHG reporting conversion factors[37] have been applied to this data to estimate the associated GHG emissions. Refer to Tables 4 to 8 in Appendix D1 for further information.

Construction effects

7.4.9 GHG emissions from construction includes the manufacture and production of construction materials (for buildings, roads and pathways), transport of construction materials to and from site, construction worker transport as well as construction site works, including demolition and construction plant use.

7.4.10 The Atkins Carbon Critical Masterplanning (ACCM) Tool[38] has been used to estimate the GHG emissions associated with the manufacture and production of construction materials for buildings. The ACCM Tool reports embodied GHG emissions for a number of building typologies. Tables 9 and 10 of Appendix D1 provide further information.

7.4.11 To calculate the GHG emissions associated with the manufacture and production of roads and pathways, assumptions were made on the length, width and depth of the roads and pathways for the Proposed Development. The ICE Database v3.0[39] was used to provide assumptions relating to material choice and the associated GHG factors. Refer to Tables 11 and 12 of Appendix D1 for further information.

7.4.12 To estimate the GHG emissions associated with the transport of construction materials to and from site, the distance travelled has been multiplied by the relevant factor from BEIS GHG reporting conversion factors[40]. Distance travelled

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[34] Arup et al. (2019), Ebury EIA: Heating and Cooling Strategy
[35] Department for Transport (2013; updated 2019), London National Transport Survey Data, Available at: https://www.gov.uk/government/collections/national-travel-survey-statistics
[36] Office for National Statistics (2011), 2011 Census Data, Available at: https://www.ons.gov.uk/census/2011census
[37] Department for Business, Energy and Industrial Strategy, Greenhouse gas reporting: conversion factors 2019. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019
[38] Atkins, 2018. Atkins Carbon Tools. Available at: https://www.atkinsglobal.com/en-gb/corporatesustainability/an-environment-with-a-future/a-low-carbon-economy/lower-carbon/carbon-tools
[39] ICE Database v3.0, November 2019. Available at: https://www.circularecology.com/embodied-energy-and-carbon-footprint-database.html#.Xm-nsKj7SUk
[40] Department for Business, Energy and Industrial Strategy, Greenhouse gas reporting: conversion factors 2019. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019

has been informed by RICS Whole life carbon assessment for the built environment (2017)[41]. The number of construction vehicle trips per day and total construction period days were provided by the draft Construction Management Plan (CMP) (Ref EBR-14). Tables 13 to 16 of Appendix D1 provide further information.

7.4.13 GHG emissions associated with construction worker transport has been estimated with assumptions on construction worker numbers, transport modal share and construction days taken from the draft CMP. BEIS GHG reporting conversion factors[42] have been applied to these data assumptions to estimate the impact on GHG emissions. All construction workers are assumed to be on site each day of the construction period. Tables 17 to 19 of Appendix D1 provide further information.

7.4.14 The impact of GHG emissions associated with construction site works has been derived using assumptions on the duration, type and number of plant vehicles, outlined within the draft CMP, which includes a Demolition and Environmental Management Plan. BEIS GHG reporting conversion factors[42] have been applied to the data to estimate the associated GHG emissions. Refer to Tables 20 to 26 in Appendix D1 for further information.

Operational effects

7.4.15 The assessment of operational effects accounts for the GHG emissions associated with building energy consumption and traffic emissions.

7.4.16 To calculate the GHG emissions associated with traffic emissions, assumptions have been made on the total number of trips, the purpose of the trip, the transport mode split and distance travelled to and from the site. BEIS GHG reporting conversion factors[42] have been applied to the data to estimate the associated GHG emissions. Refer to Tables 27 to 32 in Appendix D1 for further information.

7.4.17 The GHG emissions associated with building energy consumption has been derived from the total annual energy demand for the Proposed Development (MWh per year). This includes energy generated from solar photovoltaics (PV). GHG emissions were based on factors from the Green Book Supplementary Guidance, produced by BEIS[43], which reflects the likely decarbonisation of the UK electricity grid from the current year up to and including 2100. Refer to Tables 33 and 34 in Appendix D1 for further information.

[41] RICS (2017), RICS Professional standards and Guidance UK: Whole-life carbon assessment for the built environment, 1st edition Available at: https://www.rics.org/globalassets/rics-website/media/upholdingprofessional-standards/sector-standards/building-surveying/whole-life-carbon-assessment-for-the-builtenvironment-1st-edition-rics.pdf
[42] Department for Business, Energy and Industrial Strategy, Greenhouse gas reporting: conversion factors 2019. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2019
[43] Department for Business, Energy and Industrial Strategy (2019), Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal. Available at: https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

Cumulative effects

7.4.18 The global atmosphere is the receptor for GHG emissions. Owing to the transboundary nature of GHG emissions, the effects of the Proposed Development must be considered in the context of global GHG emissions and concentrations of GHGs in the atmosphere. All development has a cumulative effect on atmospheric GHG concentrations and climate change. As such, the assessment is inherently cumulative and therefore a separate cumulative assessment is not required.

7.5 Assumptions and limitations

7.5.1 Assumptions and limitations are included in Appendix D1.

7.6 Baseline

7.6.1 GHG emissions associated with the baseline account for 557 tCO_2e. 93% (517 tCO_2e) of the GHG emissions are associated with operational traffic and the remaining 7% (40 tCO_2e) is attributed to the operational building energy consumption.

7.6.2 Extrapolated to the comparative 50-year lifespan of the Proposed Development, the carbon emissions associated with the existing baseline over a 50-year lifespan are estimated at 26,576 tCO_2e (25,842 tCO_2e attributed to operational traffic and 734 tCO_2e attributed to operational energy respectively). The baseline GHG emissions over a 50-year lifespan accounts for the likely UK electricity grid decarbonisation as provided by BEIS.

7.6.3 Using the most recent GHG emissions data from the UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2017[44], the total contribution of baseline GHG emissions in 2019 as a proportion of the Westminster Council GHG footprint is 0.029%.

7.6.4 Table 14 presents the results of the baseline GHG emissions assessment by activity.

Table 14. Total Baseline GHG emissions (2019) by activity

Activity	GHG emissions (tCO2e)	Total GHG emissions (%)
Operational traffic	517	93%
Operational building energy consumption	40	7%
Total GHG emissions	557	100%

[44] Department for Business, Energy and Industry (2019), UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2017 Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2017

7.7 Embedded and good practice measures

7.7.1 The Westminster Code of Construction Practice (CoCP)[45] outlines embedded/good practice measures to limit GHG emissions associated with the construction activities for the Proposed Development. Section 7.4 of the CoCP outlines 'measures that will be required for limiting emissions from vehicles and machinery onsite'. Measures 'will include one or more of the following as appropriate and as far as reasonably practicable:

- ensuring that the engines of all vehicles and plant on site are not left running unnecessarily to prevent exhaust emissions (and noise);
- using low emission vehicles and plant fitted with catalysts, diesel particulate filters or similar devices;
- using ultra low sulphur fuels in plant and vehicles;
- requiring that plant will be well maintained, with routine servicing of plant and vehicles to be completed in accordance with the manufacturer's recommendations and records maintained for the work undertaken;
- requiring that all vehicles used, including off-road vehicles, will hold current MOT certificates, where required due to the age of the vehicle, (or to be tested to an equivalent standard for their class);
- avoiding the use of diesel or petrol-powered generators and using mains electricity or battery powered equipment;
- maximising energy efficiency (this may include using alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing); and
- all commercial road vehicles used in construction must meet the European Emission Standards pursuant to the EC Directive 98/69/EC (commonly known as Euro standards) of Euro 4 during any works.

7.7.2 Section 8.4 of the CoCP[45] further outlines measures relating to the re-use of construction materials to reduce embodied GHG emissions including, but not limited to:

- where possible concrete, brick from walls, foundations, terraces, bases etc. should be crushed (subject to the appropriate licenses) and reused for temporary site roads and/or capping of permanent roads;
- live vegetation should be removed for composting;
- suitable inert earth spoil should be stockpiled for reuse in landscaping or general fill;
- bituminous road surfacing should be crushed for reuse as temporary footpaths on site; and
- existing boundary fence panels should be reused as hardstanding.

7.7.3 Embedded mitigation relating to GHG emissions associated with operational energy consumption from the Proposed Development are outlined within the Energy Strategy (EBR-09). The embedded mitigation measures outlined in the

[45] City of Westminster (2016), Code of Construction Practice.

Energy Assessment adopt the Mayor's Energy Hierarchy and include, but are not limited to, the following:

- use less energy: a selection of passive demand reduction measures to reduce demand for energy including building design with high performance, insulated, air tight facades, with openable windows to provide adequate natural ventilation, should outdoor acoustic and climatic conditions be appropriate;
- use less energy: mechanical ventilation with heat recovery and efficient lighting provided to all apartments;
- supply energy efficiently: the proposal of low carbon on-site networks with the ability to connect to future low-grade heat sources;
- use renewable energy: the proposal of ground source and air source heat pumps are proposed to serve a site wide heating and cooling network with energy sharing which generates a significant carbon saving from the baseline; and
- use renewable energy: PV panels are proposed on the low-rise buildings only to avoid conflict with plant and blue roofs used for attenuation.

7.7.4 Section 11 of the Energy Strategy (Ref EBR-09) outlines further embedded mitigation measures beyond the Energy Hierarchy. This includes the installation of energy monitoring equipment to monitor energy use; in addition to the recording and reporting of energy usage data to the Mayor of London.

7.7.5 Embedded mitigation to reduce the GHG emissions associated with operational building energy consumption from the Proposed Development includes the following:

- long life, high efficacy warm white LED luminaires and intelligent controls (in line with relevant British Standards) will be deployed throughout the project to optimise energy performance and reduce energy consumption; and
- aligning with the 2019 Intend to Publish London Plan's (Policy SI 2) Energy Hierarchy as proposed in the Energy Assessment.

7.7.6 In accordance with DMS3 in the DMPD and Wandsworth's local validation requirements, a Sustainability Statement (Ref EBR-09) has been submitted, including consideration of embedded mitigation measures to reduce GHG emissions associated with the Proposed Development. This includes:

- re-using existing materials in construction where feasible;
- specifying high-durability materials to reduce waste and promote circular economy principles;
- using renewable energy through heat pumps to meet the building's thermal demands, removing the need for traditional gas boilers; and
- ensuring excellent access to public transportation and cycle access facilities to reduce the demand on private vehicle travel.

7.7.7 Embedded mitigation relating to GHG emissions associated with operational transport emissions are outlined within the Framework Travel Plan (Ref EBR-08).

7.7.8 The Westminster CoCP[45], the Energy Strategy and the Sustainability Statement (Ref EBR-09) and the Framework Travel Plan (Ref EBR-08) outline the embedded mitigation and good practice measures relating to the GHG assessment.

7.7.9 The measures outlined within Section 7.4 of the Westminster CoCP[45] have been factored into the calculations for the GHG emissions associated with construction; while those in Sections 6, 7 and 8 of the Energy Strategy (Ref EBR-09) have been factored into calculation for GHG emissions associated with operational building energy consumption.

7.7.10 Regarding GHG emissions associated with transport, Section 8.4 of the CoCP[45] outlines embedded mitigation measures incorporated into the calculations for the construction phase, while embedded mitigation measures in and the Framework Travel Plan (Ref EBR-08) have been factored into the calculations for the operational phase.

7.8 Assessment

Construction and operational effects

7.8.1 GHG emissions associated with the Proposed Development account for approximately 227,900 tCO_2e over its 50-year design life. 71% (161,800 tCO_2e) are from the construction phase and the remaining 29% (66,100 tCO_2e) to the 50-year operational phase.

7.8.2 Applying the measures described in Section 7.7 and using the most recent GHG emissions data from UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2017[44] the total contribution of the Proposed Development GHG emissions as a proportion of the Westminster Council GHG footprint is 1.3%.

7.8.3 Table 15 and Table 16 present the results of the Proposed Development GHG emissions assessment.

Table 15. Total Proposed Development GHG emissions by phase

	GHG emissions (tCO2e)	Total GHG emissions (%)
Construction period	161,800	71%
Operational period	66,100	29%
Total GHG emissions	227,900	100%

Table 16. Total Proposed Development GHG emissions by activity

Activity	GHG emissions (tCO2e)	Total GHG emissions (%)
Construction period		
Manufacture and production of construction materials (roads and pathways)	50	0.02%
Manufacture and production of construction materials (buildings)	68,700	30%
Construction material transport	85,200	37%
Construction and demolition site works (plant and equipment)	6,600	3%
Construction worker transport	1,300	1%
Operational period		
Operational traffic	62,700	28%
Operational building energy consumption	3,400	1%
Total GHG emissions	227,900	100%

7.9 Additional mitigation

7.9.1 No additional mitigation has been identified for the GHG emissions associated with the Proposed Development.

7.10 Residual effects

Construction effects

7.10.1 Beyond what is included in the City of Westminster CoCP[45], no further mitigation has been proposed with respect to construction GHG emissions effects. As such the effects are as reported in Section 7.8 of this chapter.

Operational effects

7.10.2 No further mitigation has been proposed with respect to operational GHG emissions effects. As such the effects are as reported in Section 1.8 of this chapter.

7.11 Cumulative effects

7.11.1 The assessment results presented in Section 7.8 consider the significance of GHG emissions in the context of global GHG emissions and concentrations in the global atmosphere. As such, the assessment is inherently cumulative.

7.12 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Global atmosphere	Manufacture and production of construction materials (Roads, Pathways, Buildings)	Permanent, irreversible increase of embodied GHG emissions (68,700 tCO_2e).	Significant adverse	No mitigation proposed.	Effect unchanged, remains significant adverse.	Significant adverse
Global atmosphere	Construction material transport	Permanent, irreversible increase of GHG emissions (85,200 tCO_2e).	Significant adverse	No mitigation proposed.	Effect unchanged, remains significant adverse.	Significant adverse
Global atmosphere	Construction and demolition site works (Plant & Equipment)	Permanent, irreversible increase in GHG emissions (6,600 tCO_2e).	Significant adverse	No mitigation proposed.	Effect unchanged, remains significant adverse.	Significant adverse
Global atmosphere	Construction worker transport	Permanent, irreversible increase in GHG emissions (1,300 tCO_2e).	Significant adverse	No mitigation proposed.	Effect unchanged, remains significant adverse.	Significant adverse
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Scoped out						
Use/Operation – effects arising from the use of the development						
Global atmosphere	Operational building energy consumption	Permanent, irreversible increase in GHG emissions (3,400 tCO_2e).	Significant adverse	No mitigation proposed.	Effect unchanged, remains significant adverse.	Significant adverse
Global atmosphere	Operational traffic	Permanent, irreversible increase in GHG emissions (62,700 tCO_2e).	Significant adverse	No mitigation proposed.	Effect unchanged, remains significant adverse.	Significant adverse

8 Daylight and sunlight

8.1 Introduction

8.1.1 This section describes the likely significant effects of the Proposed Development on daylight, sunlight and light pollution. It outlines the methodology, the baseline conditions and the likely significant daylight and sunlight effects associated with the construction, existence and operation of the Proposed Development. Mitigation measures that would be implemented to reduce the effect of the Proposed Development on daylight and sunlight are also described, where relevant.

8.1.2 This daylight and sunlight assessment has been produced by Hollis Global. The appended technical assessment (Appendix E3 Reflected Solar Glare and Appendix E4 Obtrusive lighting assessment) have been produced by Arup.

8.2 Scope of the assessment

8.2.1 The scope for the assessment of daylight, sunlight and light pollution is summarised in Table 17.

Table 17: Daylight and sunlight assessment scope

Assessment	Construction	Existence	Operation
Sunlight and daylight availability	×	✓	×
Glint and glare assessment	n/a	✓	×
Obtrusive lighting assessment	×	×	✓

8.2.2 A Scoping Opinion was received from WCC on 6 December 2019. There were no comments relating specifically to Daylight, sunlight and light pollution.

8.2.3 A No Sky Line assessment has been included within the scope as a result of comments from WCC in the draft Scoping Opinion which stated that the ES should include an assessment of all rooms even if the room layouts are unknown.

8.2.4 No Sky-Line (NSL, or 'DD') assessment has therefore been carried out for all relevant rooms with known or assumed uses and layouts.

8.3 Consultation

8.3.1 Consultation with the WCC development management team and the wider design team was held regarding the assessment methodology in relation to previous planning permissions for the application site.

8.3.2 Approved application 18/08372/COFUL for the demolition of Edgson House has been implemented however it was considered that the pre-demolition site conditions should form the baseline assessment conditions. This is because following demolition of Edgson House, the immediately adjacent neighbouring

properties would achieve levels of daylight and sunlight amenity that far exceed those typically expected within city centre locations, presenting an unrealistic scenario by which to assess the effects of the development. The same applies to application 19/06951/APAD for the demolition of 6 further existing blocks on the application site; it is understood that this application is approved but not yet implemented.

8.3.3 Approved application 14/01295/COFUL (for the demolition of eight existing buildings and construction of four new buildings of between four and 14 storeys to provide 271 new flats) was considered as a potential baseline by which to assess any effects of the Proposed Development over and above that of the permitted scheme. With the permission expiring in 2019, it was decided to assess the effects of the Proposed Development against the current (and pre-demolition conditions, for the reasons set out above) site conditions.

8.3.4 The Building Research Establishment publication BR209 (the 'BRE guide', as detailed below and in Appendix E1) sets out numerical targets for identifying material impacts to existing levels of amenity, however, no further numerical criteria are provided for quantifying the significance of effects where material impacts are identified. The classification of significance of effects was therefore discussed during consultation stage to inform the development management and design team of the proposed 'two-tiered' quantitative and qualitative approach to be applied.

8.4 Methodology

Overview

8.4.1 This section outlines the methodology for assessing the likely significance of effects on daylight and sunlight from the existence and operation of the Proposed Development. Full details of the methodology, including how relevant key legal requirements, planning policy and guidance have informed the assessment; the receptor sensitivity, impact magnitude and significance criteria that has been applied, information sources that have been consulted throughout the preparation of this chapter and any relevant assumptions and limitations, can be found in Appendix E1.

8.4.2 Stand-alone technical reports have been prepared for Solar Glare (Appendix E3) and Light Pollution (Appendix E4), which will detail the methodology therein.

Baseline Methodology

8.4.3 Relevant planning policy and guidance is considered in full in Appendix E1. Guidance commonly referred to by local planning authorities in the UK with respect of assessing impacts on daylight and sunlight amenity of adjoining properties is the BRE Report BR209 entitled 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice' 2nd Edition, 2011 (the "BRE guide").

8.4.4 It is important to understand that the adoption and application of the BRE Guide is not mandatory and it is not the product of any particular piece of legislation or law. The author states:

"The Guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design… In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings…"

8.4.5 The assessment area (Figure 6) has been defined in accordance with the distance to height ratio method, as recommended by the BRE guide. The daylight and sunlight sensitive receptors within the defined assessment area (Table 18) have been identified using the 25 degree-line test outlined in the BRE Report. Both methods are described in full in Appendix E1.

8.4.6 The provision of daylight and sunlight amenity to future occupants of the development is outside the scope of this chapter and instead is considered within the Daylight and Sunlight Report (EBR-06) submitted with the planning application documents. Future occupants of the development are therefore not identified as sensitive receptors for the purpose of this assessment.

8.4.7 The standalone report details technical assessment undertaken within the Detailed Area of the development (as defined in 8.7.33) as well as technical studies undertaken to determine the potential daylight and sunlight availability to the Outline Areas of the development. The daylight and sunlight levels achieved within a sample of residential units in the Detailed Area (the sample comprising the units located on the lowest floors of residential accommodation, where sky-visibility is most limited) has been assessed in the existence conditions, with the development built out in its entirety.

8.4.8 The Detailed Area of the development will be complete and occupied prior to or during demolition, construction and completion of the Outline Area, and therefore fluctuations to the levels of daylight and sunlight achieved within the Detailed Area will occur during the first years of occupation. The existence conditions represent the most restricted conditions in terms of daylight and sunlight availability, which will remain unchanged (save for any future development coming forward in the surrounding area that is not yet planned) throughout the operation of the proposed development. The standalone report concludes the daylight and sunlight amenity levels achieved in the existence conditions to be acceptable when assessed in accordance with BRE guidelines, and therefore any change in levels prior to the existence conditions would not give rise to adverse effects for the future occupants.

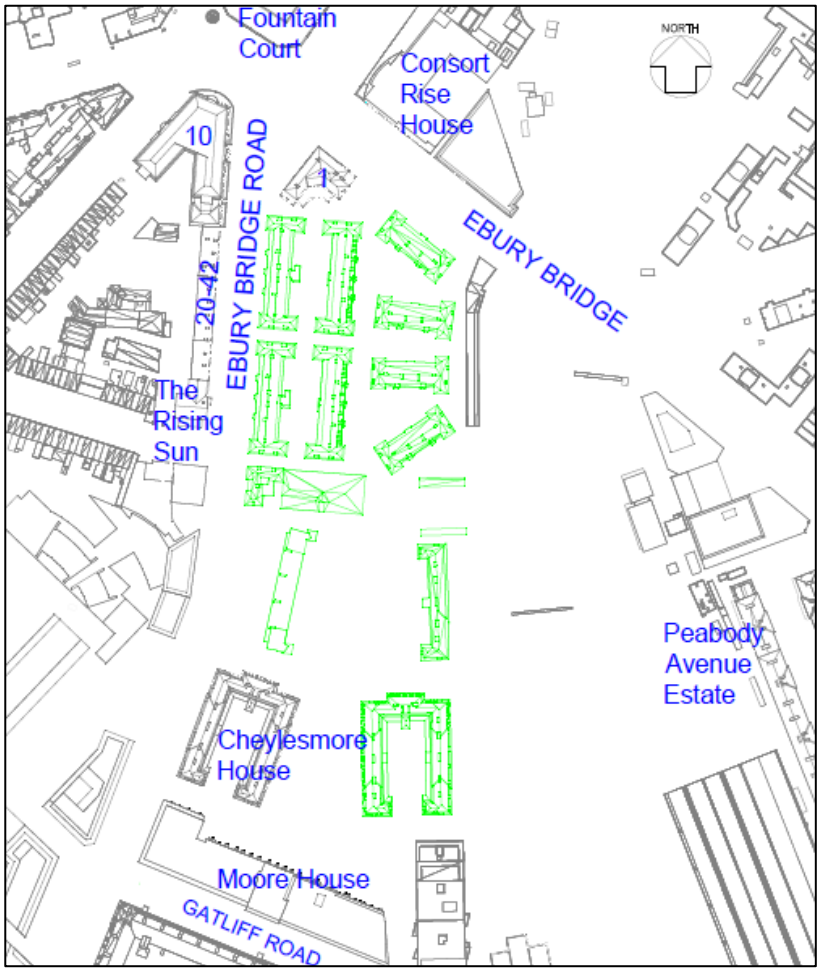

Figure 6: Location plan of baseline conditions and sensitive receptors

Table 18: Sensitive receptors

Name/address of building	Assumed use	Position in relation to the development
The Rising Sun Ph	Mixed-use	West
42 Ebury Bridge Road	Residential	West
40 Ebury Bridge Road	Residential	West
38 Ebury Bridge Road	Residential	West
36 Ebury Bridge Road	Residential	West
34 Ebury Bridge Road	Residential	West
32 Ebury Bridge Road	Residential	West
30 Ebury Bridge Road	Residential	West
28 Ebury Bridge Road	Residential	West
26 Ebury Bridge Road	Residential	West
24 Ebury Bridge Road	Residential	West
22 Ebury Bridge Road	Residential	West

Name/address of building	Assumed use	Position in relation to the development
20 Ebury Bridge Road	Residential	West
Fountain Court	Residential	North
Consort Rise House (199-203 Buckingham Palace Road)	Mixed-use	North
1 Ebury Bridge Road	Residential	North
Cheylesmore House	Residential	South
Peabody Avenue Estate	Residential	East
Moore House, Grosvenor Riverside	Residential	South

8.4.9 Assessment was enabled by the creation of a three-dimensional computer model of the site and the surrounding buildings to allow for a detailed daylight and sunlight assessment as per the BRE guidelines. The baseline conditions were determined by technical assessment carried out in accordance with the guidance given in the BRE Report and the guidance documents discussed in Appendix E1.

8.4.10 The relevant assessment methodologies are listed below.

- Vertical Sky Component (VSC);
- No Sky Line (NSL, or 'Daylight Distribution' DD);
- Annual Probable Sunlight Hours (APSH); and
- Permanent Overshadowing of External Spaces (PO)

Construction Effects

8.4.11 Construction effects have been scoped out.

Existence Effects

8.4.12 Existence conditions were assessed as per the baseline methodology, applying the Proposed Development within the 3d computer model and assessing according to BRE guidance. Material or immaterial impacts were established against BRE guide numerical targets, however, as noted in paragraph 8.3.4, the BRE guide does not provide further numerical parameters for determining the significance of effects arising from impacts and therefore a two-tiered approach has been applied;

- impacts are first considered against a set of numerical parameters formulated based on guidance provided in Appendix I of the BRE guide, consultation and professional judgement to establish an initial view on significance of effects.
- impacts are then viewed against qualitative paraments set out in Appendix I of the BRE Guide, with factors such as room use and number of affected rooms per property considered to form an overall conclusion on the significance of effects. To do this, reasonable assumptions as to room uses and property extents have been made, based on external observation and information available on WCC's online planning database and / or estate agent particulars and lease plans.

8.4.13 This approach recognises the BRE guidance notes which refers to the assessment being dependent on a number of factors and so should be considered on a case by case basis.

Significance Criteria

8.4.14 The significance criteria that has been applied to the VSC, DD and APSH is summarised in Table 19 below and is detailed in full in Appendix E1.

Table 19: Significance Criteria

Assessment		**Vertical Sky Component (VSC)**			**Daylight Distribution (DD)**			**Annual Probable Sunlight Hours (APSH)**		
Significant Criteria		**Absolute**		**Retained relative to baseline**	**Absolute**		**Retained relative to baseline**	**Absolute (AS: Annual Sun WS: Winter Sun)**		**Retained relative to baseline**
		Retained	Change		Retained	Change		Retained	Change	
Adverse	Negligible	>=27%	N/A	>=0.8	>=80%	N/A	>=0.8	>=25% AS >=5% WS	<=4% AS	>=0.8
	Minor	>=20%	- <5%	>= 0.7	>=70%	- <1sqm	>= 0.7	>=20% AS	<=5% AS	>= 0.7
	Moderate	>=15%	- <10%	>= 0.6	>=50%	- <5sqm	>= 0.6	>=15% AS	<=10% AS	>= 0.6
	Major	<15%	- >10%	<0.6	<50%	- >5sqm	<0.6	<15% AS	>10% AS	<0.6
Beneficial	Negligible	>27%	N/A	<1.2	>80%	N/A	<1.2	>=25% AS >=5% WS	+ <4% AS	<1.2
	Minor	>27%	+ <5%	>=1.2	>80%	+ <1sqm	>=1.2	>=25% AS >=5% WS	+ >4% AS	>=1.2
	Moderate	>27%	+ <10%	>=1.3	>80%	+ <5sqm	>=1.3	>=25% AS >=5% WS	+ >5% AS	>=1.3
	Major	>27%	+ >10%	>1.4	>80%	+ >5sqm	>1.4	>=25% AS >=5% WS	+ >10% AS	>1.4

8.4.15 In summary, impacts are initially categorised as ‘negligible’, ‘minor’, ‘moderate’ and ‘major’, based on a series of numerical parameters.

8.4.16 Where BRE compliant levels of change (or no change) in daylight and sunlight levels are identified, the impacts will be considered ‘negligible’ and will be classified as **neutral** effects.

8.4.17 Changes in daylight and sunlight levels that satisfy the numerical criteria for ‘minor’ impacts (having regard to additional qualitative data) will be classified as **beneficial** or **adverse** effects that are **not significant**.

8.4.18 Changes in daylight and sunlight levels that satisfy the numerical criteria for ‘moderate’ or ‘major’ impacts (again having regard to additional qualitative data) will be classified as **beneficial** or **adverse** effects that are **significant.**

8.4.19 The significance of effects arising from impacts on sensitive receptors are therefore categorised as **neutral, not significant beneficial, not significant adverse, significant beneficial or significant adverse.**

8.4.20 The report for existence solar glare effects is provided in Appendix E3, and the conclusions set out in the report are referenced in this chapter.

Operational Effects

8.4.21 Operational effects on daylight and sunlight amenity have been scoped out.

8.4.22 The report for operational light pollution effects is provided in Appendix E4, and the conclusions set out in the report are referenced in this chapter.

Cumulative Effects

8.4.23 The baseline assessment is inherently cumulative and, following review of pending developments in the area, additional cumulative assessment was not deemed necessary.

8.5 Baseline

8.5.1 This section details the daylight and sunlight amenity that exists within the surrounding residential properties in the baseline conditions. The methodology section highlights the residential properties identified as sensitive receptors relevant for assessment, which have been tested for daylight and sunlight amenity against the numerical criteria provided in the BRE guide.

8.5.2 The results for the assessed buildings and the receptors presented in Table 18 are shown in full in Appendix E2 and are summarised in Table 20 below.

Table 20: Baseline conditions

Assessment Conditions	Ana-lysis	Windows / Rooms Assessed		Windows compliant with BRE numerical targets			Windows not compliant with BRE numerical targets							
							Total		Minor Adverse		Moderate Adverse		Major Adverse	
		All	Living	**All**	**Living**		All	Living	All	Living	All	Living	All	Living
Baseline Conditions	VSC	441	243	**256**	**151**		185	92	153	74	16	10	16	8
				58 %	**62%**		42 %	38%	35 %	30%	4%	4%	4 %	3%
	DD	351	180	**265**	**145**		86	35	33	16	43	15	10	4
				75 %	**81%**		25 %	19%	9%	9%	12 %	8%	3 %	2%
	APSH	239	108	**211**	**99**		28	9	15	0	9	6	4	3
				88 %	**92%**		12 %	8%	6%	0%	4%	6%	2 %	3%

8.5.3 Table 20 shows that 58% of assessed neighbouring windows currently achieve the BRE recommended target VSC of 27%, which highlights the BRE target values as unrealistic benchmarks when applied within city-centre locations. 185 windows (including 92 living room windows) currently fall below BRE targets,

however, 153 windows achieve good VSC values of above 20%. Below this, 16 living room windows achieve reasonable VSC values of above 15%, and 16 living room windows achieve lower VSC values of below 15%.

8.5.4 Table 20 shows that 81% of assessed neighbouring rooms currently achieve the BRE recommended target DD of 80%. 86 rooms (including 35 living rooms) currently fall below BRE targets, however, many rooms achieve good DD values of above 70%. Below this, 15 living rooms achieve reasonable DD values of above 50%, and four living rooms achieve lower DD values below 50%.

8.5.5 Table 20 shows that 88% of assessed neighbouring windows currently achieve the BRE recommended target APSH of 25% (with 5% occurring during winter months), which is an exceptionally high level of annual and winter sunlight compliance for a city-centre location. 28 windows (including nine living room windows) currently fall below BRE targets, however, 15 windows achieve good annual sunlight values of above 20%. Below this, six living room windows achieve reasonable annual sunlight values of above 15%, and three living room windows achieve lower annual sunlight values of below 15%.

8.6 Embedded and good practice measures

8.6.1 Daylight and sunlight amenity was a key design consideration during the iterative design process of the Proposed Development. Significant design amendments were implemented as embedded measures to reduce the potential adverse impacts on neighbouring daylight and sunlight amenity, including:

- the merging of Blocks 9 and 10 to reduce the proposed massing and increase the distance from neighbouring buildings;
- the lowering of ‘shoulder’ heights across the tower blocks;
- stepping back the upper storeys of the mansion blocks to increase the sky visibility from neighbouring properties; and
- setting back the footprint of mansion blocks located near shared boundaries to increase the distance between neighbouring properties, increasing daylight and sunlight availability for both existing neighbouring occupants and future occupants of the Proposed Development.

8.7 Assessment

Construction effects

8.7.1 Construction effects on daylight and sunlight were scoped out.

Existence effects

Compliance with BRE targets

8.7.2 The existence conditions with the Proposed Development in place are summarised in Table 21.

Table 21: Existence Conditions

Assessment Conditions	Ana-lysis	Windows / Rooms Assessed		BRE Compliant			Non BRE Compliant Windows							
							Total		Minor Adverse		Moderate Adverse		Major Adverse	
		All	Living	**All**	**Living**		All	Living	All	Living	All	Living	All	Living
Existence Conditions	VSC	441	243	**126**	**84**		315	159	167	87	96	45	52	27
				29%	**35%**		71%	65%	38%	36%	22%	19%	12%	11%
	DD	351	180	**156**	**88**		195	92	46	28	78	37	71	27
				44%	**49%**		56%	51%	13%	16%	22%	21%	20%	15%
	APSH	239	108	**184**	**83**		55	25	30	12	8	4	17	9
				77%	**77%**		23%	23%	13%	11%	3%	4%	7%	8%

8.7.3 By way of direct comparison with the baseline conditions, the BRE absolute target values are applied to the existence conditions in Table 21, as summarised in the following text.

8.7.4 Table 21 shows that 29% of assessed neighbouring windows will achieve the BRE recommended target VSC of 27% with the Proposed Development in place. 315 windows (including 159 living room windows) will not achieve BRE targets, compared to the 185 windows (and 92 living room windows) in the baseline conditions. However, the majority (167 windows) will continue to achieve good VSC values of above 20%. Below this, 45 living room windows will retain reasonable VSC values of above 15%, and 27 living room windows will retain lower VSC values of below 15%.

8.7.5 Table 21 shows that 44% (compared to the baseline 75%) of assessed neighbouring rooms will continue to achieve the BRE recommended target DD of 80%. 195 rooms (including 92 living rooms) will not achieve BRE targets, compared to the 86 rooms (and 35 living rooms) in the baseline conditions. 46 rooms will continue to achieve good DD values of above 70%. Below this, 37 living rooms will retain reasonable DD values of above 50%, and 27 living rooms will retain lower DD values below 50%.

8.7.6 Table 21 shows that 77% (compared to the baseline of 88%) of assessed neighbouring windows will continue to achieve the BRE recommended target APSH of 25% (with 5% occurring during winter months) with the Proposed Development in place. 55 windows (including 25 living room windows) will not achieve BRE targets, compared to the 28 windows (and 9 living room windows) in the baseline conditions. however, 30 windows will continue to achieve good annual sunlight values of above 20%. Below this, 4 living room windows will retain reasonable annual sunlight values of above 15%, and 9 living room windows will retain lower annual sunlight values of below 15%, with the latter being a slight improvement on the baseline conditions.

8.7.7 Table 22 compares the existence conditions as a percentage of baseline conditions to establish existence effects, applying the BRE 'reduction factors' where appropriate.

Table 22: Existence Effects

Assessment Conditions	Ana-lysis	Windows / Rooms Assessed		BRE Compliant			Non BRE Compliant Windows							
							Total		Minor Adverse		Moderate Adverse		Major Adverse	
		All	Living	**All**	**Living**		All	Living	All	Living	All	Living	All	Living
Existence Effects	VSC	441	243	**252**	**161**		189	82	111	53	56	17	22	12
				57 %	**66%**		43 %	34%	25 %	22%	13 %	7%	5 %	5%
	DD	351	180	**222**	**121**		129	59	34	24	65	19	30	16
				63 %	**67%**		37 %	33%	10 %	13%	19 %	11%	9 %	9%
	APSH	239	108	**196**	**85**		43	23	23	13	8	2	12	8
				82 %	**79%**		18 %	21%	10 %	12%	3%	2%	5 %	7%

VSC

8.7.8 Table 22 shows that 57% of assessed neighbouring windows will retain a VSC of or over 27% (or at least 0.8 times the baseline value) with the Proposed Development in place. The effect to these windows is considered neutral.

8.7.9 189 windows (including 82 living room windows) will fall below BRE targets following implementation of the Proposed Development. Of these for 111 windows (including 53 living room windows), the impacts are considered minor adverse, retaining relative VSC values within 0.7 times the baseline value, or absolute VSC values above 20% with effects considered to be **not significant adverse.**

8.7.10 For 56 windows (including 17 living room windows), the impacts are considered moderate adverse, retaining relative VSC values within 0.6 times the baseline value, or absolute VSC values above 15% with considered to be **significant adverse.**

8.7.11 22 windows (including 12 living room windows) would experience major adverse impacts, retaining relative VSC values of less than 0.6 times the baseline value, or absolute VSC values of less than 15%. The effects are considered **significant adverse.**

DD

8.7.12 Table 22 shows that 63% of assessed neighbouring rooms will retain a DD of or over 80% (or at least 0.8 times the baseline value) with the Proposed Development in place. The effect to these windows is considered **neutral**.

8.7.13 129 rooms (including 59 living rooms) will fall below BRE targets following implementation of the Proposed Development. Of these, 34 rooms (including 24 living rooms), the impacts are considered minor adverse, retaining relative DD values within 0.7 times the baseline value, or absolute DD values above 70%. The effects are considered not **significant adverse**.

8.7.14 For 65 rooms (including 19 living rooms), the impacts are considered moderate adverse, retaining relative DD values within 0.6 times the baseline value, or absolute DD values above 50%. The effects are **considered significant adverse**.

8.7.15 30 rooms (including 16 living rooms) would experience major adverse impacts, retaining relative DD values of less than 0.6 times the baseline value, or absolute DD values of less than 50%. The effects are **considered significant adverse**

APSH

8.7.16 Table 22 shows that 82% of assessed neighbouring windows will retain an APSH value of or over 25% (or at least 0.8 times the baseline value) with at least 5% APSH (or at least 0.8 times the former value) occurring during the winter months or would see their absolute APSH values reduced by no more than 4% with the Proposed Development in place. The effect to these windows is considered neutral.

8.7.17 43 windows (including 23 living room windows) will fall below BRE targets following implementation of the Proposed Development. Of these, for 23 windows (13 of which are living room windows), the impacts are considered minor adverse, retaining relative ASPH values within 0.7 times the baseline value, or absolute APSH values above 20%. The effects are considered **not significant adverse.**

8.7.18 For eight windows (including two living room windows), the impacts are considered moderate adverse, retaining relative APSH values within 0.6 times the baseline value, or absolute values above 15%. The effects are considered **significant adverse.**

8.7.19 12 windows (including eight living room windows) would experience major adverse impacts, retaining relative APSH values of less than 0.6 times the baseline value, or absolute APSH values of less than 15%. The effects are considered **significant adverse**.

Qualitative analysis

8.7.20 The significant adverse effects identified above are considered below, applying the qualitative factors provided in BRE Report guidance. The conclusions are summarised on a per property basis. A table summarising the VSC, DD and APSH results for each property and in-depth discussion of the results is provided for each property in Appendix E5.

The Rising Sun

8.7.21 The overall effect on this property is considered not significant adverse for both daylight and sunlight amenity, taking into account the negligible to minor VSC, DD and APSH impacts to R1 (see Appendix E5, Section E5.2), which is reasonably assumed to be the main living space within this property.

20 to 42 Ebury Bridge Road

8.7.22 Based on external observation and historic estate agent particulars available in the public realm, it is assumed that these terraced properties are typically arranged with the main living space at ground floor, and bedrooms on the upper floors.

8.7.23 The VSC, DD and APSH assessment results for this property are summarised below. Section E5.2.2 of Appendix E5 provides a detailed description of the assessment data and qualitative analysis of the results.

8.7.24 20 Ebury Bridge Road would remain BRE compliant for the VSC, DD and APSH tests, and the effect on daylight and sunlight amenity would be **neutral.**

8.7.25 Taking into account the negligible or minor VSC, DD and APSH impacts to the rooms reasonably assumed to be the living rooms within 22 to 28 and 32 to 34 Ebury Bridge Road, the overall effect to these properties is considered **not significant adverse** for both daylight and sunlight amenity**.**

For the remaining five properties (30 and 36 to 42 Ebury Bridge Road), the assumed living rooms would experience negligible to minor adverse VSC and APSH impacts, and further review of the moderate adverse DD percentage reductions to these rooms reveal small absolute changes to the no sky line of no greater than 3.5 sqm. The overall effect to these properties is therefore considered **not significant adverse** for daylight and sunlight amenity**.**

Fountain Court

8.7.26 This residential block is located to the north of the application site. Partial floorplans were obtained for publicly accessible sources and have been used to inform our assumptions as to the internal layouts of this property.

8.7.27 Section E5.2.3 of Appendix E5 provides a detailed description of the assessment data and qualitative analysis of the results.

8.7.28 55 windows have been assessed across 43 rooms for daylight amenity using the VSC and DD test. All windows would comply with BRE recommendations for VSC, and all but one room would comply with BRE recommendations for DD. This room, an assumed living room, would retain a DD value that is 0.79 times the former value, marginally below the BRE recommended 0.8. The effect on daylight amenity is therefore considered **not significant adverse.**

8.7.29 43 windows facing within 90 degrees of due south were assessed for sunlight amenity using the APSH test. All windows comply with BRE recommendations, and the effect on sunlight amenity is therefore **neutral.**

1 Ebury Bridge Road

8.7.30 This property is located to the immediate north of the development and contains 12 flats with windows located on the rear and flank elevations, overlooking the development site. It is understood that the upper floors are purpose built residential apartments, but that the ground and first floor were formerly in use as a medical centre which has since been converted into residential apartments.

8.7.31 Lease plans showing detailed internal layouts were obtained for the majority of flats overlooking the development (with the exception of those at third floor) and

have been applied within the assessment environment. Floor plans for the second floor below have been used to inform assumptions as to the internal layouts of these third-floor flats.

8.7.32 Section E5.2.4 of Appendix E5 provides a detailed description of the assessment data and qualitative analysis of the results on a per property basis.

8.7.33 It should be noted that this property will not be adversely affected by the detailed application proposal (the 'Detailed Area'), with the outline massing giving rise to the transgressions (the 'Outline Area') coming forward at a later date. The effects will therefore be progressive (rather than immediate as implied by the assessment) and therefore less noticeable to the occupants as the phased development is built out over time.

8.7.34 Assessment results demonstrate that Flats L, Q and E would remain BRE compliant for daylight and sunlight amenity using the VSC, DD and APSH tests, and the effects on these properties would be **neutral** and therefore are not considered further

8.7.35 The significance of effects for the remaining flats is summarised as follows;

Flat K

8.7.36 This flat is located at ground floor within the rear two-storey wing to the rear of the property. From floor plans, it can be seen that all eight windows overlooking the development site serve habitable rooms, with the two large centre windows serving the main living space.

8.7.37 Numerical data shows moderate adverse VSC impacts to the main living room and minor adverse VSC impacts to the kitchen, with negligible change in DD to all rooms. Whilst the VSC changes are likely to be noticeable, the retained absolute VSC to the living room and kitchen (where daylight is considered most important (para 2.1.13 of the BRE guide) are in-line with those achieved by other habitable rooms in the property in the baseline conditions, and are commensurate with values typically achieved in urban areas. Over 80% of each room area will retain access to visible sky and the overall impact on daylight amenity to this property is therefore considered **not significant adverse**.

8.7.38 In terms of sunlight, numerical data shows moderate adverse APSH impacts would occur to the main living room, and overshadowing impacts would occur to the terrace on 21 March. Given that sunlight is considered most important in living rooms (notwithstanding that the retained levels of annual sunlight are considered in-line with those typically achieved in urban areas), the overall impact on sunlight amenity is considered **significant adverse.**

Flat J

8.7.39 This corner flat is located at ground floor of the property; floor plans show four of the six windows serving habitable space overlook the existing Ebury Bridge Estate to the south, with two bedroom windows overlooking Bridge Road to the east. The open plan living / kitchen / dining space enjoys a corner aspect, but all three windows closely overlook the development site.

8.7.40 Numerical data shows minor to moderate adverse daylight impacts in VSC to the main living room, with minor change in DD. One bedroom will not be materially affected by the development. The overall impact on daylight amenity (bearing in mind the retained levels of daylight in the main living space are considered in-line with those typically achieved in urban areas) is therefore considered **not significant adverse**.

8.7.41 In terms of sunlight, numerical data shows minor to moderate adverse APSH impacts would occur to the main living room. The rear garden will see no change on 21 March and will remain BRE compliant on June 21. At least one habitable room in this property will retain BRE compliant levels of sunlight amenity in-line within Standard 32 of the Mayor of London's SPG and the overall impact on sunlight amenity is considered **not significant adverse.**

Flat P

8.7.42 This flat is located at first floor within the rear two-storey wing to the rear of the property. From floor plans, it can be seen that all five windows overlooking the development site serve habitable rooms, with the large central window serving the main living space.

8.7.43 Whilst numerical data shows major adverse daylight impacts in VSC to the main living room, there would be negligible change in DD to all rooms and over 80% of each room area will continue to retain access to visible sky. The overall impact on daylight amenity is therefore considered **not significant adverse**.

8.7.44 In terms of sunlight, minor adverse APSH impacts would occur to the main living room, with retained annual sunlight values being marginally below BRE target. The overall impact on sunlight amenity is considered **not significant adverse.**

Flat N

8.7.45 This corner flat is located at first floor; from floor plans it can be seen that six of the eight windows serving habitable space overlook the existing Ebury Bridge Estate to the south, with two bedroom windows overlooking Bridge Road to the east. The open plan living / kitchen / dining space enjoys a corner aspect, but all three windows closely overlook the development site.

8.7.46 Numerical data shows moderate adverse daylight impacts in VSC and minor adverse impacts in DD to the main living room. One bedroom will remain not materially affected by the development. The overall impact on daylight amenity (and bearing in mind the retained levels of daylight in the main living space are considered in-line with those typically achieved in urban areas) is therefore considered **not significant adverse**.

8.7.47 In terms of sunlight, numerical data shows minor adverse APSH impacts would occur to the main living room. All rooms will retain annual sunlight values that meet or exceed BRE recommendations and the overall impact on sunlight amenity is considered **not significant adverse**

Flat B

8.7.48 Flat B is located at second floor, occupying the western wing of the floor; from floor plans it can be seen that the only habitable rooms facing the development

site are a kitchen and a study, with all bedrooms and the main living room facing onto Ebury Bridge Road, away from the site. All other windows facing the site serve bathrooms or circulation areas which do not require testing for daylight and sunlight amenity under BRE guidelines.

8.7.49 Daylight and sunlight to the main living room will remain unaffected by the development, and the roof terrace will retain BRE compliant levels of sunlight. The effect on daylight and sunlight amenity is therefore considered **not significant adverse.**

Flat A

8.7.50 Flat A is located at second floor, occupying the eastern wing of the building; from floor plans it can be seen that half of the habitable rooms face the development site (a bedroom, dining room and living room) and the other half (two bedrooms and a kitchen) face away from the site, onto Ebury Bridge.

8.7.51 Taking into account the high retained VSC values of the main living space, along with the small absolute reductions in DD, the overall effect on daylight amenity is considered **not significant adverse**. For sunlight, at least one habitable room achieves BRE complaint sunlight in-line with Standard 32 of the Mayor of London's SPG, and the overlay impact on sunlight is considered **not significant adverse**.

Flat D

8.7.52 Flat D is located at third floor, occupying half of the eastern wing of the building; we have been unable to obtain floorplans showing detail internal layouts, with only the basic layout shown on lease plans. We have therefore assumed a similar internal configuration as Flat A on the floor below.

8.7.53 Taking into account the minor VSC reduction to the main living space and the high retained absolute value, the effect on daylight amenity is considered **not significant adverse**. With full BRE compliance for sunlight amenity, the effect is considered **neutral**.

Flat C

8.7.54 Flat C is located at third floor, and again floorplans showing detailed internal layouts have not been obtained, with only the basic layout shown on lease plans. According to the outline lease plan, just one window in this flat would overlook the development site. If following a similar layout to the floor below, this window is likely to serve a bedroom (which would have a lesser requirement for daylight and sunlight amenity).

8.7.55 Taking into account the likely use of the affected room as a bedroom, the effect on daylight amenity is considered **not significant adverse**. With full BRE compliance for sunlight amenity, the effect is **neutral**.

Consort Rise House (199-203 Buckingham Palace Road)

8.7.56 This purpose-built apartment building is located to the northeast of the application site, across Ebury Bridge.

8.7.57 Section E5.2.5 of Appendix E5 provides a detailed description of the assessment data and qualitative analysis of the results.

8.7.58 Taking into account the minor VSC impacts and BRE compliance for DD (and that all affected rooms are served by additional corner aspect windows that will not be adversely affected by the development), it is considered that the overall effect on the daylight amenity to this property is **not significant adverse**.

8.7.59 Turning to sunlight amenity, APSH results show that three living room windows beneath recessed balconies (window reference 'W10' in each case, see Appendix E1) would experience small absolute reductions in APSH of 6%, 5% and 6% respectively, but such reductions when expressed as a percentage of the low existing value appear disproportionately large. It should be noted that the BRE considers an absolute reduction of 4% or less will not be noticeable to the occupants. It should be noted that these rooms are each served by an additional south-east facing window that will remain unaffected by the Proposed Development, and the effect on sunlight amenity to this property is considered **not significant adverse**.

8.7.60 It should be noted that this property will not be adversely affected by the detailed application proposal (the 'Detailed Area'), with the outline massing giving rise to the transgressions (the 'Outline Area') coming forward at a later date. The effects will therefore be progressive (rather than immediate as implied by the assessment) and therefore less noticeable to the occupants as the phased development is built out over time.

Cheylesmore House

8.7.61 This property is located to the immediate south of the development; 40 flats have windows located on the north and east-facing elevations, overlooking the development site.

8.7.62 Lease plans showing detailed internal layouts were obtained for a number of flats overlooking the development and have been applied within our assessment environment. Where floorplans were not available, we have used those obtained for neighbouring flats to inform our assumptions as to the internal layouts. We state below where floorplans or assumptions have been used.

8.7.63 From these floorplans, it is understood that the vast majority of flats in Cheylesmore House are dual aspect, with habitable rooms facing out onto the development site and into the courtyard of the building. Based on the floorplans that we have seen, it appears that most units have their living rooms facing onto the site, and bedrooms facing into the courtyard, although some flats appear to be configured the other way around.

8.7.64 Section E5.2.6 of Appendix E5 provides a detailed description of the assessment data and qualitative analysis of the results on a per property basis.

8.7.65 108 windows have been assessed across 42 flats within the building. It should be borne in mind that only those windows facing the development have been included in the assessment, and 38 of these 42 flats would contain other windows (not assessed) that remain unaffected by the development.

8.7.66 Assessment results demonstrate that all tested rooms within Flats 1, 11, 25, 39, 47 and 61 would remain BRE compliant for daylight and sunlight amenity using the VSC, DD and APSH tests, and the effects on these properties would be **neutral**.

8.7.67 The main living room within Flats 18, 32 and 46 do not overlook the development and would not be affected for daylight and sunlight amenity. 1 site-facing bedroom would experience moderate VSC impacts and the other would remain BRE compliant. Bedrooms are considered to have a lesser requirement for daylight amenity by the BRE guide. The overall effects on daylight amenity to these properties would be **not significant adverse**. With full BRE compliance for APSH, the effects on sunlight amenity to these properties would be **neutral.**

8.7.68 The main living room window in Flats 7, 12, 26, 40 and 54 would remain BRE compliant for daylight using the VSC test and would experience minor adverse DD impacts; the overall effects on daylight amenity to these properties would be **not significant adverse**. With full BRE compliance for APSH, the effects on sunlight amenity to these properties would be **neutral.**

8.7.69 The main living room windows within Flats 2, 3, 13, 14, 19, 33, 55, 56 and 57 would experience minor adverse VSC impacts but would remain BRE compliant for DD; the effects on daylight amenity to these properties would be **not significant adverse.** With full BRE compliance for APSH, the effects on sunlight amenity to these properties would be **neutral.**

8.7.70 Flats 27, 28 and 42 would experience minor adverse VSC and DD effects to the main living room, and the effects on daylight amenity to these properties would be **not significant adverse.** With full BRE compliance for APSH, the effects on sunlight amenity to these properties would be **neutral.**

8.7.71 The main living rooms within Flats 41, 59, 60 would experience minor adverse VSC impacts and moderate adverse DD impacts, and the overall effects on daylight amenity to these properties would be **not significant adverse**. With the exception of Flat 59, full BRE compliance would be achieved for APSH and the effects on sunlight amenity to these properties would be **neutral.**

8.7.72 The main living room in Flat 15, 29 and 43 would experience moderate adverse VSC impacts but would remain BRE compliant for DD. The overall effects on daylight amenity to these properties would be **not significant adverse**. With full BRE compliance for APSH, the effects on sunlight amenity to these properties would be **neutral.**

8.7.73 The main living room in Flat 6 would experience major adverse VSC impacts but would remain BRE compliant for DD. The overall effects on daylight amenity to this property would be **not significant adverse**. With full BRE compliance for APSH, the effects on sunlight amenity to this property would be **neutral.**

8.7.74 The remaining flats (Flat 4, 5, 16, 17, 30, 31, 44, 45, 58 and 59) would experience moderate to major daylight and / or sunlight impacts (based on numerical data alone) that could potentially give rise to significant adverse impacts. These effects to these flats are summarised in turn below.

Flat 4

8.7.75 The main living room would experience moderate to major adverse impacts in VSC and DD. Notwithstanding that the retained VSC levels would be in line with those typically achieved in city-centre locations, the effect on daylight amenity would be considered **significant adverse**. It should be borne in mind that (based on reasonable assumptions) at least one other habitable room in this flat will remain unaffected by the development. The effect on sunlight amenity is considered **neutral**, with full BRE compliance achieved.

Flat 5

8.7.76 The main living room will experience moderate to major adverse impacts in VSC, DD and APSH. Whilst it should be borne in mind that the obstruction of the property itself (due to the placement of the window in the internal corner of the building; see para E5.2.6.2 of Appendix E5) causes limited daylight availability in the baseline conditions (and the constraints this place on the development site), the overall impact on daylight and sunlight amenity is considered **significant adverse**. However, it is important to note that the levels of daylight and sunlight achieved to at least one other habitable room in this property will remain unaffected by the development.

Flat 16

8.7.77 The main living room would experience moderate to major adverse impacts in VSC and DD. Notwithstanding that the retained VSC levels would be in line with those typically achieved in city-centre locations, the effect on daylight amenity would be considered **significant adverse**. The effect on sunlight amenity is considered **neutral**, with full BRE compliance achieved.

Flat 17

8.7.78 The main living room will experience moderate to major adverse impacts in VSC, DD and APSH. Whilst it should be borne in mind that the obstruction of the property itself causes limited daylight availability in the baseline conditions (and the constraints this place on the development site), the overall effect on daylight and sunlight amenity is considered **significant adverse**. However, it is important to note that the levels of daylight and sunlight achieved to at least one other habitable room in this property will remain unaffected by the development.

Flat 30

8.7.79 The main living room would experience moderate to major adverse impacts in VSC and DD. Notwithstanding that the retained VSC levels would be in line with those typically achieved in city-centre locations, the effect on daylight amenity would be considered **significant adverse**. The effect on sunlight amenity is considered **neutral**, with full BRE compliance achieved.

Flat 31

8.7.80 The main living room will experience moderate to major adverse impacts in VSC, DD and APSH, and the impact on daylight and sunlight amenity is therefore considered **significant adverse**. However, it should be borne in mind that

obstructions caused by the building itself considerably limit daylight and sunlight availability to the affected room, resulting in over-reliance to daylight and sunlight from over the application site. Furthermore, the levels of daylight and sunlight achieved to at least one other habitable room in this property will remain unaffected by the development.

Flat 44

8.7.81 The main living room would experience **moderate to major adverse impacts** in VSC and DD. Considering retained VSC to the main living room is is-line with values typically achieved in city-centre locations, and taking into account the good retained levels of daylight distribution within the kitchen, the effect on daylight amenity would be considered **not significant adverse**. The effect on sunlight amenity is considered **neutral**, with full BRE compliance achieved.

Flat 45

8.7.82 The main living room will experience moderate to major adverse impacts in VSC, DD and APSH. Whilst it should be borne in mind that the obstruction of the property itself causes limited daylight availability in the baseline conditions (and the constraints this places on the development site), the overall effect on daylight and sunlight amenity is **considered significant adverse**. However, the levels of daylight and sunlight achieved to at least one other habitable room in this property will remain unaffected by the development.

Flat 58

8.7.83 The main living room would experience **moderate to major adverse impacts** in VSC and DD. Considering retained VSC to the main living room is is-line with values typically achieved in city-centre locations, and taking into account the good retained levels of daylight distribution within the kitchen, the effect on daylight amenity would be considered **not significant adverse**. The effect on sunlight amenity is considered neutral, with full BRE compliance achieved.

Flat 59

8.7.84 The main living room will retain good VSC levels that are marginally below BRE recommendations, but with moderate DD impacts. All other habitable rooms would remain unaffected by the Proposed Development and the effect on daylight amenity is therefore considered **not significant adverse**. The main living room would experience major adverse APSH impacts and the effect on sunlight amenity is therefore considered **significant adverse.** However, limitations caused by the building itself should be considered, along with the other habitable rooms in the property that will remain affected by the development.

Summary

8.7.85 Overall, four flats, Flat 16, Flat 30, Flat 44 and Flat 58 are identified as potentially experiencing adverse daylight impacts to all habitable rooms in the flat. However, these flats will continue to achieve annual and winter sunlight values far in excess of the BRE recommended target values. All other flats will retain the existing daylight and sunlight levels within at least 1 habitable room, which will not be affected by the development. For the vast majority of habitable rooms that are affected by the development, daylight impacts will be minor to

moderate, but sunlight will not be materially affected. Where sunlight impacts and larger daylight impacts are experienced, this is limited to the corner window in Flat 5, 18, 31, 45, and 19 that are heavily obstructed on one side by Cheylesmore House itself.

8.7.86 It should be noted that the majority of flats within this property will not be adversely affected by the detailed application proposal (the 'Detailed Area'), with the outline massing giving rise to the BRE transgressions (the 'Outline Area') when coming forward at a later date. The effects will therefore be progressive (rather than immediate as implied by the assessment) and therefore less noticeable to the occupants as the phased development is built out over time. Many flats will currently be enjoying significantly improved levels of daylight amenity following the demolition Edgson House, with the lower site conditions of the 'meanwhile use'.

Moore House, Grosvenor Estate

8.7.87 This property is located to the south of the development and contains multiple flats with windows located on the north and east-facing elevations, overlooking the development site.

8.7.88 A full set of recent floorplans were not obtainable, (with the plans uploaded with the planning application appearing to be outdated, and do not match with external observation). Our assessment of this property is therefore based on a combination of these plans (where matching external observation), lease plans (which show only outlines of the leased demises rather than detail layouts) and our reasonable assumptions from external observation.

8.7.89 Section E5.2.7 of Appendix E5 provides a detailed description of the assessment data and qualitative analysis of the results.

8.7.90 In terms of sunlight, no windows facing with 90 degrees of due south would be affected by the Proposed Development, and the effects on sunlight amenity would be **neutral.**

8.7.91 Taking into account the negligible or minor VSC impacts to living room / studio windows and bearing in mind BRE guidance on overly deep accommodation and room-use in relation to DD, the overall effect on daylight amenity to these properties is considered not significant adverse.

Solar Reflected Glare

8.7.92 The report titled 'Solar Reflected Glare Assessment' produced by Arup & Partners Ltd (dated 5 April 2020) details the existence solar glare effects of the Proposed Development. The following extract from the executive summary of the report summarises the results;

"As the extent of the reflections identified by the assessment is considered typical of contemporary residential architecture for a city where medium / high rise buildings surround transport infrastructures, it is expected that, in practical terms, the instances of reflected sunlight will be dealt with by using appropriate anti-glare visors. This is common practise when dealing with direct sunlight in any other glare instance, or, alternatively, and specific for rail, by modification of the signal gantries to provide increased contrast ad visibility."

Operational effects

8.7.93 Completion of the final phase of the Proposed Development is projected for 2028 and operational effects are not considered to differ to those identified as existence effects; the effects are therefore expected to range from neutral to significant adverse, as above. The baseline environmental conditions in this year are likely to change further if new development is planned and implemented in the area, and neighbouring properties may experience reduced levels of daylight and sunlight amenity than those detailed in the section as a result. Such new developments are not considered potential sensitive receptors for daylight and sunlight amenity themselves as they are likely to come forward during or after construction of the Proposed Development, and future occupants would therefore not experience change in the levels of daylight and sunlight.

8.7.94 The report titled 'Obtrusive Lighting Assessment' produced by Arup & Partners Ltd (dated 27 March 2020) details operational obtrusive lighting effects of the Proposed Development. The report concludes;

"The assessment considered all parameters included in the ILP GN01 Guidance Notes for the reduction of obtrusive light: 2020.

This was performed by a combination of lighting calculations and geometric analysis of the photometric data.

All parameters meet guidance and the lighting design complies with the ILP recommendations for environmental zone E3.

No further recommendations are considered necessary as all results are compliant."

8.8 Additional mitigation

8.8.1 Once the Proposed Development is complete and occupied, taking into consideration the city centre location of the Proposed Development, it is considered that the levels of daylight and sunlight amenity retained by the neighbouring properties are commensurate with those typically achieved in city-centre locations. Taking into account the embedded mitigation measures implemented at design stage, no additional mitigation measures are proposed.

8.9 Residual effects

8.9.1 As mitigation measures are not proposed, residual effects remain as reported for the existence effects.

Construction effects

8.9.2 Construction effects have been scoped out.

Existence effects

8.9.3 No mitigation has been proposed/is practicable with respect to existence effects related to daylight and sunlight. As such the effects would be as reported in Section 5.8.

Operational effects

8.9.4 Operational effects have been scoped out.

8.10 Cumulative effects

8.10.1 As the daylight and sunlight assessment is inherently cumulative, the assessment results presented in Sections 5.8 to 5.10 include consideration of the new and pending developments set out in Appendix E1. No further cumulative assessment is therefore required in relation daylight and sunlight amenity.

8.11 Assessment summary

Receptor	Impacts (numerical assessment)	Overall Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Scoped Out						
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Rising Sun PH	Reduction in availability of daylight/sunlight, based on compliance with BRE guidelines, due to proposed massing blocking a portion of the visible sky beneath existing obstruction of roof-overhang. Negligible to Minor adverse impacts to assumed main living space and moderate adverse impacts to assumed bedrooms. The impacts are long-term.	Minor Adverse effects to property overall on basis of negligible to minor adverse impacts to main living space, where daylight and sunlight is considered most important.	Not significant Adverse effects	No further mitigation proposed	Effects unchanged	Not applicable
20-42 Ebury Bridge Road	Reduction in availability of daylight/sunlight, based on compliance with BRE guidelines, due to proposed massing blocking a portion of the visible sky. Negligible VSC, DD and APSH impacts to 20 EBR Negligible to Minor impacts in VSC, DD and APSH to 22-28, 32-34 EBR Negligible, Minor to moderate VSC, DD, APSH impacts to individual rooms in 30, 36 to 42 EBR The impacts are long-term.	Negligible to minor adverse overall impacts to properties (on a per property basis) overall due to negligible to minor VSC impacts, and small absolute DD reductions to main living spaces assumed at ground floor level.	Not significant Adverse effects	No further mitigation proposed	Effects unchanged	Not Applicable
Fountain Court	Marginal reduction in availability of daylight below BRE guidelines, due to proposed massing blocking a portion of the visible sky. Negligible to minor DD impact to one living room. All other rooms BRE compliant for VSC, DD and APSH	Negligible to minor adverse	Neutral to not significant Adverse effects	No further mitigation proposed	Effects unchanged	Not Applicable

Receptor	Impacts (numerical assessment)	Overall Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
	The impact is long-term.					
Consort Rise House	Reduction in availability of daylight/sunlight, based on compliance with BRE guidelines, due to proposed massing blocking a small portion of the visible sky beneath existing obstruction of recessed balconies in front of main living area windows. Negligible to minor adverse VSC and APSH impacts, negligible DD impacts The impacts are long-term.	Negligible to minor adverse impacts	Not significant Adverse effects	No further mitigation proposed	Effects unchanged	Not Applicable
1 Ebury Bridge Road	Reduction in availability of daylight/sunlight, based on compliance with BRE guidelines, due to proposed massing blocking a portion of the visible sky. Negligible VSC, DD and APSH impacts: Flat L Negligible to moderate adverse VSC and DD impacts, resulting in overall minor daylight impacts: Flat K, J, P, N, B, A, D, C Negligible APSH impacts: Flat D, C Negligible to minor APSH (and or overshadowing) impacts: Flat J, P, N, B, A Moderate to major APSH (and or overshadowing impacts): Flat K The impacts are long-term.	Negligible to major adverse	Daylight: Neutral to Not significant Adverse effects Sunlight: Neutral to Significant Adverse effects	No further mitigation proposed	Effects unchanged	Not Applicable
Cheylesmore House	Reduction in availability of daylight/sunlight, based on compliance with BRE guidelines, due to proposed massing blocking a portion of the visible sky. Main living room not site-facing. Minor to moderate VSC or DD impacts to non-living rooms, negligible APSH impacts:	Negligible to major adverse	Daylight: Neutral to Significant Adverse effects	No further mitigation proposed	Effects unchanged	Not Applicable

Receptor	Impacts (numerical assessment)	Overall Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
	Flats 18, 32 and 46 Negligible VSC, DD and negligible APSH impacts to main living room: Flats 1, 11, 25, 39, 47 and 61 Negligible VSC and APSH impacts, minor DD impacts to main living room: Flats 7, 12, 26, 40 and 54 Minor adverse VSC impacts and negligible DD and APSH impacts to main living room: Flats 2, 3, 13, 14, 19, 33, 55, 56 Minor adverse DD and VSC impacts to main living room, negligible APSH impacts: Flats 27, 28 and 42 Minor adverse VSC impacts and moderate adverse DD impacts and negligible APSH impacts: Flats 41, 59, 60 Moderate adverse VSC impacts, negligible DD and APSH impacts: Flat 15, 29 and 43 Major VSC impacts, negligible DD and APSH impacts: Flat 6 Moderate to major adverse VSC, DD or APSH impacts: Flat 5, 17, 31, 45 and 59 Moderate to major adverse VSC and DD impacts, negligible APSH impacts, other rooms unaffected: Flat 4 Moderate to major adverse VSC and DD impacts, negligible APSH impacts, all rooms affected: Flat 16, 30, 44, and 58 The impacts are long-term.		Sunlight: Neutral to Significant Adverse effects			

Receptor	Impacts (numerical assessment)	Overall Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Grosvenor Waterside, Moore House	Reduction in availability of daylight/sunlight, based on compliance with BRE guidelines, due to proposed massing blocking a portion of the visible sky. Negligible to minor VSC impacts to a number of main living room windows and studio apartments. Negligible to minor DD impacts to living rooms within a number of flats. Moderate to major DD impacts to main studio apartments with deep areas of accommodation. Main living area remains BRE compliance, combined with negligible or minor VSC impacts; overall minor daylight impacts. Negligible APSH impacts for sunlight amenity. The impacts are long-term.	Negligible to minor adverse	Daylight: Neutral to Not significant Adverse effects Sunlight: Neutral	No further mitigation proposed	Effects unchanged	Not Applicable
Peabody Estate	Negligible VSC, DD and APSH impacts The impacts are long-term.	Negligible	Neutral	No further mitigation proposed	Effects unchanged	Not Applicable
Use/Operation – effects arising from the use of the development						
Scoped Out						

9 Ecology and biodiversity

9.1 Introduction

9.1.1 This section describes the likely significant effects of the Proposed Development on ecology and biodiversity. It outlines the methodology, the baseline conditions and the likely significant ecological effects associated with the construction, existence and operation of the Proposed Development. Mitigation measures that will be implemented to reduce the effects of the Proposed Development on ecology and biodiversity are also described, where relevant. The assessment then considers residual ecological effects following the implementation of mitigation and cumulative effects in conjunction with other developments.

9.2 Scope of the assessment

9.2.1 The proposed scope for the assessment of ecology and biodiversity is summarised in Table 23.

Table 23: Ecology and biodiversity assessment scope

Assessment	Construction	Existence	Operation
Habitats and species	✓	✓	✓
Statutory and non-statutory designated sites	×	×	×

9.2.2 A Scoping Opinion was received from Westminster City Council on 6th December 2019. This included one comment relating to ecology. Responses to these comments are detailed in Appendix A3. In summary, the Environment Agency commented that the development should minimise the impact on and provide net-gains for biodiversity. An ecological baseline was established and protected species (bat) surveys undertaken to support reductions in adverse effects, and ecological enhancements have been incorporated into the design to maximise biodiversity net gain.

9.3 Consultation

9.3.1 In November 2019 and April 2020, Natural England was consulted regarding the strategy for bat mitigation, specifically concerning the approach to licencing for the demolition of Wellesley, Hillersdon, Dalton, Mercer and Pimlico Houses, as well as the clearance of some scattered trees (under a Prior Approval Application (Application Ref: 19/06951/APAD)). The following provides a summary of the phone conversations and their follow up emails are included in Appendix F1.

9.3.2 There are two potential avenues for licencing: European Protected Species Mitigation (EPSM) Licence; and Low Impact Licence. Natural England was uncertain whether it would be possible to apply for a Low Impact Licence given the potential for the buildings to support hibernating bats.

9.3.3 The lack of emergence and re-entry survey data between May and July 2019 was discussed, as well as access restrictions associated with the presence of asbestos

in the loft spaces. It was recommended that as much survey work as possible (where both feasible and proportionate) should be undertaken to support a future licence application.

9.3.4 In the absence of full unrestricted survey evidence, Natural England suggested considering the employment of licensing policy 4 as part of an European Protected Species Mitigation (EPSM) Licence application. Licensing policy 4 permits a lower than standard survey effort where 'the costs or delays associated with carrying out standard survey requirements would be disproportionate to the additional certainty that it would bring; the ecological impacts of development can be predicted with sufficient certainty; and mitigation or compensation will ensure that the licensed activity does not detrimentally affect the conservation status of the local population of any EPS.'

9.3.5 It was concluded that a pre-demolition emergence/re-entry survey could be undertaken in mid to late May 2020, following submission of the licence application, to inform the mitigation strategy. This aligns with the programme for the demolition of Wellesley, Mercer, Pimlico, Dalton and Hillersdon Houses between June 2020 and January 2021.

9.4 Methodology

Overview

9.4.1 This section outlines the methodology for assessing the likely significant effects on ecology and biodiversity from the demolition, construction, existence and operation of the Proposed Development.

Baseline methodology

Desk study

9.4.2 In October 2019, an ecological data search was undertaken within a 1km radius of the approximate centre of the Proposed Development. Information on statutory and non-statutory sites and notable[46] and legally protected species records was obtained from Greenspace Information for Greater London (GiGL) in October 2019[47] and the London Bat Group in March 2020[48]. Only records of protected and notable species dated from within the last ten years were considered in the baseline review. Older records are not considered likely to be representative of the status of biodiversity in the local area, due to the changes in habitats over time and resulting changes in species distribution. Additional information on statutory designated nature conservation sites was obtained from the government's MAGIC website[49].

[46] Notable species are those species which might be locally noteworthy, such as common cow-ear within Walthamstow Forest (part of Epping Forest SAC) and now scarce in the region (London/Essex) and only found in a few coppiced woods.
[47] eCountability 'Greenspace Information for Greater London (GiGL) Ecological Data Search' Report reference 13318. Prepared: 23 October 2019
[48] London Bat Group 'Bat Records Search' Received: 15th March 2020
[49] Natural England, (2013); 'Magic'. Available at: http://magic.defra.gov.uk/.

Field surveys

9.4.3 Ecological surveys were undertaken within the site boundary (refer to Appendix F3).

9.4.4 The ecological surveys undertaken are detailed in Table 24. All surveys were undertaken by suitably experienced ecologists following standard methods as described in good practice guidelines[50]. Full details regarding the methods for the surveys in 2019 are provided in the Preliminary Ecological Appraisal (PEA) Report and Bat Species Report in Appendix F3.

9.4.5 Bat emergence surveys were conducted on 21st and 28th May 2020 on Wainwright, Wellesley, Mercer, Dalton, Pimlico and Hillersdon Houses employing the same methodology as the bat emergence surveys carried out in August and September 2019.

Table 24: Ecological surveys carried out on site

Survey Type	Dates
Extended Phase 1 habitat survey	September 2013 (validated in June 2019)*
Bat automated survey	June and July 2019
Bat emergence/re-entry surveys	August and September 2019 and May 2020
*A site walkover was undertaken by suitably experienced ecologists in June 2019 to record any changes to the results and conclusions of the 2013 extended Phase 1 habitat survey.	

9.4.6 Internal inspections of the roof spaces of Wellesley, Mercer, Pimlico, Dalton and Hillersdon Houses were undertaken in early June 2020, to record opportunities for roosting bats and signs to indicate their presence in accordance with good practice guidelines[50]. Full details are provided in the Bat Inspection Filenote in Appendix F3.

Method for assessment

9.4.7 The assessment process follows The Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment[51]. The principal steps are:

- Scoping identifies ecological features that are both present and might be affected by the Proposed Development;
- Ecological features are valued to place their relative biodiversity and nature conservation value into geographic context;
- Impacts are actions resulting in changes to an ecological feature. Both positive and negative impacts of the Proposed Development are identified and characterised;

[50] Collins, J. (ed.)(2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust. Available at: https://cdn.bats.org.uk/pdf/Resources/Bat_Survey_Guidelines_2016_NON_PRINTABLE.pdf?mtime=20181115113931&focal=none

[51] CIEEM, 2018. *Guidelines for Ecological Impact Assessment (EcIA)*. Available at: https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/

- Effects are the outcomes to an ecological feature, resulting from an impact. The significance of potential effects on ecological features are assessed; and
- Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Therefore, cumulative impacts which may elevate effects associated with the Proposed Development are assessed.

9.4.8 Full details of method for assessment are described in Appendix F2.

9.5 Assumptions and limitations

9.5.1 The demolition of Wellesley, Hillersdon, Dalton, Mercer and Pimlico Houses, as well as the clearance of some scattered trees, has been deemed acceptable under a Prior Approval Application (Application Ref: 19/06951/APAD). This will commence prior to the submission of this planning application. However, following good practice guidance[51], the baseline survey data recorded in 2019 and 2020 will form the basis of the assessment, i.e. the baseline will include all eleven buildings and scattered trees recorded in the PEA.

9.5.2 No account can be made for the presence or absence of a species on any single survey visit, as animals regularly move between different sites used for breeding, foraging and shelter. However, professional review of past records and habitat suitability, together with the level of survey effort employed, follows the precautionary principle and allows for sufficient certainty about the use of the site by notable and protected species.

9.5.3 Detailed limitations of each survey type are included in the PEA and Bat Report in Appendix F3.

9.6 Baseline

9.6.1 This section outlines the baseline conditions on the site in the absence of proposed activities and attributes a value to the ecological features in accordance with Table F3.1 in Appendix F3. Full details regarding the results of the surveys that were used to inform this assessment are contained in the PEA and Bat Report in Appendix F3. Features of site value have not been considered further in the assessment.

Statutory and non-statutory designated sites

9.6.2 All statutory and non-statutory designated sites, which are described in the PEA, are separated from the site by existing high-rise residential developments such as Chelsea Barracks and highways such as the A3212. Given their separation from the Proposed Development, and the scale of works predicted, no impacts are anticipated on these sites, their conservation objectives or their qualifying features. Therefore, they are not considered further in the assessment.

Habitats

9.6.3 The following habitats are considered further in the assessment due to the potential for impacts from habitat loss:

- Buildings – eleven buildings are located across the site. Wainwright house is of low potential to support roosting bats. All other buildings are of moderate potential to support roosting bats. The site location adjacent to National Rail land linking to the River Thames to the south provides navigational features for commuting bats. Due to this, as well as their potential value to roosting bats, buildings are considered to be of borough/district value.
- Scattered trees – several mature scattered trees were recorded across the site. Species include Italian alder *Alnus cordata*, cherry *Prunus sp.* and birch *Betula sp.*. Scattered trees are a flagship habitat under the Westminster Local Biodiversity Action Plan (BAP)[52] and there are few in the public realm surrounding the Proposed Development. Due to this, scattered trees are considered to be of local value.

9.6.4 The amenity grassland, introduced shrub and hardstanding had very limited diversity and few native species; therefore, they are considered to have site level ecological value and are not considered further in the assessment.

Protected and notable species

Bats

9.6.5 Desk study records from the London Bat Group identified five *Pipistrellus* sp. roosts within 2km of the site (the nearest of which is approx. 900m east).

9.6.6 The existing park and scattered trees provide foraging and commuting habitat for common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* bats. There are a number of potential roosting features (PRFs) at roof level within all buildings, except Wainwright House, including lifted and missing roof tiles, gaps in lead work and hanging tiles on the side of dormers. No bats were recorded emerging from Wainwright house during the survey on 21st May and therefore this building was approved for demolition.

9.6.7 Results from the automated and emergence/re-entry surveys suggest the potential presence of day roosts for low numbers of male or non-breeding female common and soprano pipistrelle bats within Bridge, Dalton, Pimlico, Westbourne, Hillersdon and Rye houses over the summer period. No signs of bats were recorded during the internal inspections of the roof voids. The buildings also have some limited potential to support hibernating pipistrelle bats. The results of surveys do not indicate the presence of a maternity roost.

9.6.8 All bat species are fully protected under the Wildlife & Countryside Act 1981 (as amended)[53] and the Conservation of Habitats and Species Regulations 2017 (Habitats and Species Regulations)[54]. Further details regarding their protected and conservation status are provided in Appendix F3.

[52] Westminster Biodiversity Action Plan Parks and Green Spaces (2008) Available at: https://www.westminster.gov.uk/biodiversity-action-plan
[53] HMSO (1981); 'The Wildlife and Countryside Act 1981.' Available at: http://www.legislation.gov.uk/ukpga/1981/69
[54] Her Majesty's Stationary Office (HMSO), (2017); 'The Conservation of Habitats and Species Regulations 2017.'

9.6.9 The site is considered to be of borough/district value to bats, given the suitable foraging and commuting habitat, as well as the potential presence of day roosts and hibernation roosts for common and soprano pipistrelle.

Other protected and notable species

9.6.10 The background data search identified several notable or protected species records within 1km of the Proposed Development such as house sparrow *Passer domesticus* and Mediterranean gull *Ichthyaetus melanocephalus*; however, no notable or protected bird species were recorded in the PEA and no further survey effort was recommended because of a lack of suitable habitat for these species onsite. As such, these species will not be assessed further.

9.6.11 Protected and/or notable species, such as reptiles, badger *Meles meles*, otter *Lutra lutra* and water vole *Arvicola amphibious*, hedgehog *Erinaceus europaeus*, hazel dormouse *Muscardinus avellanarius* and great crested newt *Triturus cristatus* have not been recorded within the last 10 years within 1km of the site. There is also a lack of suitable habitat for these species onsite and a lack of habitat connectivity to suitable ponds, woodland and hedgerows offsite. The ornamental planting at the site is also unlikely to support an assemblage of notable invertebrates. As such, these species will not be assessed further.

9.6.12 Other wild mammals are likely present on the site, such as red fox *Vulpes vulpes*. As these species are common and widespread across similar urban environments, they will not be assessed further.

Future Baseline

9.6.13 The baseline survey data was gathered in 2013 and validated in 2019. The assessment was completed in spring and summer 2020. Enabling works, including the demolition of six buildings, under a Prior Approval Application (Application Ref: 19/06951/APAD), will commence prior to determination of the application (in spring 2020). Construction of the Detailed Area will commence in mid 2021 and the Outline Area in early 2023. Therefore, enabling works and demolition will commence prior to the submission of this planning application. No significant changes are predicted between 2019 and the commencement of demolition given the nature of habitats at the site and short period of time involved.

9.6.14 Over prolonged periods of time, fauna may change their spatial distribution at various scales. This could apply with respect to the commencement of the Detailed Area and Outline Area of the Proposed Development. Species may also return to, or colonise new areas at any future time, particularly if there is a change in the habitat structure. For example, trees currently assessed to be of negligible potential to support roosting bats, may have potential roosting features in future years as they grow and develop fissures and cracks. Similarly, it is expected that the condition of the buildings will worsen with time; additional PRF could become available to bats and the use of the buildings could change.

Summary of baseline

9.6.15 Ecological features and their value are summarised in Table 25.

Table 25: Ecological features

Ecological Feature	Geographic Level of Importance
Bats	Borough/District
Buildings	Borough/District
Scattered trees	Local

9.7 Embedded and good practice measures

Demolition Management Plan and Construction Environment Management Plan

9.7.1 The draft Construction Management Plan (CMP), which includes a Demolition Management Plan (DMP) (Ref EBR-14) has been developed in line with the Westminster Code of Construction Practice (CoCP)[55]. Appropriate measures will be adopted to protect the ecology of the area, with special attention to specified areas of ecological value. Key elements of this document are:

- Contractors are required to avoid the impacts of habitat removal on nesting birds;
- Contractors are required to avoid the impacts of construction on bats;
- Areas of existing trees to be retained must be suitably protected before any materials or machinery are brought on site;
- Contractors are required to monitor effectiveness of the management measures designed to control the impacts associated with works that may affect ecological receptors; for example, tree root protection zones;
- Prior to and during construction, there will be consultation with Natural England and planning authorities as appropriate; and
- Site lighting design, position and direction must include measures to prevent unnecessary disturbance to wildlife and ecologically sensitive areas.

9.7.2 Furthermore, there will be no night-time working during demolition and construction. Lighting will comply with good practice guidance[56] to minimise disturbance to roosting, foraging and commuting bats. Lighting will avoid lighting on the bat boxes, both within the park and integrated into the building facades, and there will be minimal lighting in these areas of the site.

Environmental embedded design measures

9.7.3 The Proposed Development has been designed to avoid and minimise ecological impacts, mitigate effects where necessary and provide ecological enhancements in line with the National Planning Policy Framework (NPPF)[57]. The Landscape

[55] City of Westminster 2016 Code of Construction Practice Available at: https://www.westminster.gov.uk/code-construction-practice
[56] Bat Conservation Trust and the Institution of Lighting Professionals, (2018); 'Bat Guidance Note 08/18 Bats and artificial lighting in the UK. Bats and the Built Environment series.'
[57] Department for Communities and Local Government. (2012). National planning policy framework. Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

Strategy has also been designed to target an Urban Greening Factor (UGF) of least 0.3 following the Intend to Publish new London Plan[58]. These measures are:

- Landscaping at ground level will provide approximately 225 scattered trees, hedge planting, rain gardens, meadow and bulb layering and planting inspired by native woodlands, as well as native and introduced shrubs;
- Planting strategies using both native and semi-native species that confer a known benefit to biodiversity. This includes plants that produce nectar throughout the year. Planting will be predominantly of a provenance which will tolerate future predicted climatic conditions;
- Roof terraces above Level 1 to provide private amenity space for residents. Planting will comprise herbaceous species and grasses with bulbs to add biodiversity, selecting species of value to local wildlife;
- Biodiverse green roof on blocks 1-4 with an average substrate depth of 150mm and rainwater harvesting measures to assist with water attenuation;
- Bird and bat boxes and natural timber features for invertebrates will be provided. Four bat boxes will be installed on retained trees within the park and six bat boxes will be integrated within the southern façades of blocks 1 to 4 and 9. Bat boxes will ideally face south, south-east and/or south-west and be located between 4m and 6m above the ground. Bird boxes will face between north and east and, where possible, be located adjacent to landscaped areas of the Proposed Development; and
- The lighting strategy will be developed in accordance with current guidance[56], avoiding lighting on the bat boxes on the trees and integrated into the building facades and minimising light levels in these areas. The lighting strategy will also be developed in consultation with an ecologist.

9.8 Assessment

Construction effects

Bats

9.8.1 As photophobic species, bats are sensitive to lighting. Therefore, additional night-time lighting associated with demolition and construction has the potential to disturb roosting bats and prevent bats from foraging and using dispersal pathways within the site.

9.8.2 The existing urban environment within and surrounding the site is characterised by active residential blocks and major roads, both of which are associated with noise and night-time lighting. Furthermore, compliance with good practice guidance[56] and avoidance of lighting on the bat boxes (refer to paragraph9.7.2) will minimise disturbance to roosting, foraging and commuting bats. As such, the potential effects of disturbance are **not significant**.

[58] GLA 2019 Intend to Publish London Plan Available at: https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/intend-publish-london-plan-2019

Existence effects

Bats and buildings

9.8.3 The Proposed Development will involve the demolition of all twelve buildings, including six buildings that potentially support common and soprano pipistrelle day roosts (Bridge, Dalton, Pimlico, Westbourne, Hillersdon and Rye houses) and six others with moderate bat roosting potential (Bridge, Bucknell, Doneraile, Mercer, Victoria and Wellesley). In the absence of mitigation, demolition therefore has the potential to result in the loss of roosting sites, harm and disturbance to bats, and the displacement of these bats to other available sites (potentially including buildings retained until construction of the Outline Area), which would lead to an offence under wildlife legislation.

9.8.4 To compensate for the loss of roosting sites associated with the demolition under the Prior Approval Application (see 9.5.1) bat boxes will be erected on retained trees within the park. Furthermore, integrated bat boxes will be provided within the building facades. However, with respect to buildings demolished as part of the Outline Area (Bridge, Westbourne and Rye), there will be a temporary loss of potential roosting sites (within buildings) between demolition and construction, between July 2022 (the start of Phase 2 demolition) and 2027 (the end of Phase 3 construction and fit-out). See Parameter Plan EBE-AST-XX-XX-DR-A-011102 for phases.

9.8.5 Vegetation clearance as a result of the Proposed Development will result in the loss of foraging and commuting habitat for bats. The majority of scattered trees and the existing park will be lost. However, the Landscape Strategy for the Proposed Development incorporates a range of habitats such as rain gardens and planting inspired by native woodland. At the first floor, between blocks 5 and 6, 6 and 7, 7 and 8, and 8 and 9, elevated podium space at Level 1 will contain areas of planting with a substrate depth suitable for grasses and small trees. Whilst these are predominantly amenity spaces for end users, these areas will provide habitat for foraging and commuting bats. Moreover, these podium spaces promote connectivity for bats between Network Rail land to the east, and ground level landscaping within the rest of the Proposed Development. These habitats will take time to mature but, in the long-term, they will incorporate a diversity of species that will attract insects and provide improved foraging habitat for bats. In addition, a green corridor running north-south, where the historical canal once stood, has been incorporated into the Proposed Development to provide foraging and commuting habitat.

9.8.6 The potential effect on bats is **permanent long-term significant adverse effect at a district/borough level**, due to the potential loss of roosting sites and risk of harm and disturbance to roosting bats.

Scattered Trees

9.8.7 The Proposed Development will result in the loss of approximately 27 individual scattered trees[59], due to the need for clearance ahead of earthworks. The majority of these have been identified as Category B (moderate quality with a possible

[59] Levitt Bernstein, 2020. *Tree removal and retention plan*. Doc reference: EBE-LBA-XX-GF-SK-L-XX

contribution of 20 years or more) and will result in the loss of flagship habitat under the Westminster Local BAP[52]. This will result in the loss of suitable habitat for birds and invertebrates. The preliminary bat roost assessment considered all surveyed trees to have negligible potential to support roosting bats.

9.8.8 Approximately 225 new trees will be planted within the site as part of the Proposed Development to compensate for the loss of scattered trees[59]. These will comprise species such as swamp Spanish oak *Quercus palustris* and silver birch *Betula pendula*. New tree planting will typically have a minimum trunk diameter of 18-20cm. Although new trees will take time to mature, this not only provides appropriate mitigation for the habitat lost, but also enhances the future quality of habitat (once established and mature), which will be of long-term benefit to biodiversity onsite.

9.8.9 There is expected to be a short-term potential adverse effect on scattered trees, however, this effect is **not significant**, considering that there will be a net gain of trees; the number of trees being planted significantly exceeds that being lost. The long-term potential effect on scattered trees is **permanent significant beneficial at a local scale**.

Operational effects

Bats

9.8.10 The existing urban environment surrounding the site is characterised by active residential blocks and major roads, both of which are associated with noise and night-time lighting. The lighting strategy for the Proposed Development will be designed in accordance with good practice guidelines. There will be no lighting on the bat boxes on trees and façade-integrated bat roosts and light levels will be minimised in these areas. As such, the potential effect on bats is **not significant**.

9.9 Additional mitigation

Bats

9.9.1 Additional survey work will be undertaken ahead of demolition within the Outline Area to provide clarity regarding the status of potential bat roosts and inform the mitigation strategy (including the scheduling of works). This will include further emergence and re-entry surveys between May and September and internal inspections of the roof voids and/or automated surveys to assess the importance of these areas to hibernating bats, access permitting.

9.9.2 A EPSM licence application was submitted to Natural England on 1st May 2020 to facilitate the demolition under the Prior Approval Application (see 9.5.1). The application is due to be determined by 30th June 2020 ahead of the demolition of the remaining buildings (Mercer, Pimlico, Dalton, Hillersdon and Wellesley). In addition to the bat boxes, which have been incorporated into the design of the Proposed Development. The mitigation strategy includes a soft strip of the roof spaces prior to the demolition of the buildings, from April to October inclusive, when bats are active. This will focus on areas of highest potential value where PRFs were/are recorded.

9.9.3 The requirements for mitigation for demolition within the Outline Area will be determined following further surveys. Further details regarding the mitigation strategy for bats are provided in Appendix F4.

9.10 Residual effects

Existence effects

9.10.1 The implementation of additional mitigation, including the completion of further surveys and provision of alternative compensatory roosts, will mitigate impacts on buildings and bats. Therefore, the residual effects are **not significant**.

9.11 Cumulative effects

9.11.1 The list of developments identified for assessing cumulative effects is presented as Appendix A5. In Table 26, cumulative effects with each of these developments are examined, and an assessment of the cumulative effects presented where appropriate.

Table 26: Ecology cumulative effects

Development	Potential for significant cumulative effects	Comments
Battersea Power Station	No	The redevelopment of Battersea Power Station into residential housing with significant retail offering has the potential to have a permanent adverse effect on bats as roosts were recorded on site. However, a Bat Management Strategy has been drawn up in consultation with Natural England to mitigate this. Extensive planting and landscaping will provide additional commuting and foraging habitat for bats. Therefore, there is no potential cumulative effect.
Chelsea Barracks	No	This residential development has potential to have adverse impacts to bats and scattered trees. However, no bat roosts were recorded at the site. Extensive planting and landscaping will compensate for tree removal and provide additional commuting and foraging habitat for bats. Therefore, there is no potential cumulative effect on bats or scattered trees.
Cringle Dock Waste Transfer Station	No	The redevelopment of the existing waste transfer station has no potential impacts or significant effects to bats, buildings, or scattered trees. Therefore, there is no potential cumulative effect.
Thames Tideway Tunnel	No	There are two Thames Tideway sites within 1km of the site: Kirtling Street; and Chelsea Embankment. These sites are on temporarily reclaimed land within the River Thames and are for the purposes of constructing the Thames Tideway Tunnel underground. Subsequently there are no impacts to buildings, bats or scattered trees; therefore, there is no potential cumulative effect.
Cundy Street Quarter	No	This residential development has potential to have adverse impacts to bats and scattered trees. However, no bat roosts were recorded at the site. Extensive planting and landscaping will compensate for tree removal and provide additional commuting and foraging habitat for bats. Living roofs have also been designed across the development to enhance biodiversity. Therefore, there is no potential cumulative effect on bats or scattered trees.

9.12 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Bats	Lighting pollution	Disturbance	Not significant	N/A	Not significant	Not significant
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Bats and buildings	Building demolition	Harm and disturbance to bats, temporary loss of roosting habitat	Permanent long-term significant adverse at a borough/district scale	Demolition under the Prior Approval Application - EPSM licence and bat soft strip. Outline Area demolition - Further bat surveys and implementation of recommended mitigation.	Not significant	Not significant
Scattered trees	Removal and planting of trees	Habitat loss and creation	Permanent short term significant beneficial at local scale	N/A	Permanent long-term significant beneficial at local scale	Not significant
Use/Operation – effects arising from the use of the development						
Bats	Lighting pollution	Disturbance	Not significant	N/A	Not significant	Not significant

10 Electromagnetic interference

10.1 Introduction

10.1.1 This section describes the likely significant effects of the Proposed Development on electromagnetic interference (EMI). It outlines the methodology, the baseline conditions and the likely significant EMI effects associated with the construction, existence and operation of the Proposed Development. Mitigation measures which would be implemented to reduce the effects of the Proposed Development on EMI are also described, where relevant.

10.2 Scope of the assessment

10.2.1 The scope of the assessment of EMI is summarised in Table 27.

Table 27: Electromagnetic Interference assessment scope

Assessment	Construction	Existence	Operation
Terrestrial television	×	✓	n/a
Satellite television	×	✓	n/a
Broadcast radio	×	×	n/a

10.2.2 A Scoping Opinion was received from Westminster City Council on 6th December 2019. This did not include any comments relating to EMI.

10.3 Consultation

10.3.1 Apart from at the scoping stage, no consultation was carried out.

10.4 Methodology

Overview

10.4.1 This section outlines the methodology for assessing the likely significant effects on terrestrial and satellite television reception from the existence of the Proposed Development.

Baseline methodology

10.4.2 Publicly accessible information has been used to identify the terrestrial and satellite television transmitters currently serving the Proposed Development site and surrounding areas.

10.4.3 The detailed methodology is described under the ‘Existence effects’ section below.

Construction effects

10.4.4 The construction effects of the Proposed Development on terrestrial and satellite television reception in the vicinity of the Proposed Development, including potential effects on receptors within the development (i.e. existing receptors in outline area during construction of Phase 1 (Detailed Area); and new occupiers of the detailed area during construction of Phases 2 and 3 (Outline Area)) have been scoped out of the assessment due to their intermittent and infrequent nature and not being significant in scale.

Existence effects

10.4.5 The assessment has been undertaken to identify the existing residential receptors in the vicinity of the Proposed Development, and any new receptors within the Detailed Area once constructed, that may potentially experience disruption to their terrestrial and satellite television reception.

10.4.6 Within the Proposed Development, the impact on television reception in the Detailed Area has been assessed by analysing the location of the Detailed Area with respect to the terrestrial and satellite television transmitters currently serving the Proposed Development and surrounding areas.

10.4.7 The existence effects of the completed Proposed Development on terrestrial and satellite television in the vicinity of the Proposed Development have been assessed using a three-dimensional model of the development.

10.4.8 The assessment is based on:

- the location of the Proposed Development in relation to the location of the terrestrial and satellite television transmitters serving the Proposed Development site and surrounding areas;
- the massing of the Proposed Development; and
- principles of electromagnetic wave propagation.

10.4.9 The quantitative assessment, which includes modelling in AutoCAD, is based on first applying geometrical optics to identify broadly the areas around the development where television reception could be affected.

10.4.10 Principles of radio signal transmission from transmitting to receiving antennas have been used to identify the impact of the major structures in the site boundary on television reception (or shadows created) in the area surrounding the Proposed Development.

10.4.11 The quantitative assessment is in accordance with OFCOM guidance on desktop assessments set out in their publication "Tall structures and their impact on broadcast and other wireless services" dated 26 August 2009[60].

10.4.12 The significance of the impacts on television reception is assessed by considering the size of any shadows created by the Proposed Development, the number of households in these shadows (using Census data from the Office for National

[60] https://www.ofcom.org.uk/__data/assets/pdf_file/0026/63494/tall_structures.pdf

Statistics[61]), the type of television services employed by households (using the most recent Ofcom Technology Tracker figure listed in paragraph 10.4.13) and the predicted effects on signal reception, namely diffraction.

10.4.13 According to the Ofcom Technology Tracker Wave 2019[62] published in April 2019, on average across the UK:

- 32% of consumers main type of television is terrestrial;
- 15% of consumers main type of television is cable;
- 34% of consumers main type of television is satellite;
- 12% of consumers main type of television is via a broadband line; and
- 4% have no television.

10.4.14 The following significance criteria are used, on the basis of the number of households where television reception may be affected:

- No impact - No households;
- Negligible - less than 30 households;
- Slight - 30-100 households;
- Moderate - 100-500 households; and
- Major - greater than 500 households

Operational effects

10.4.15 There are no specific operational effects, beyond existence of the Proposed Development, that will impact terrestrial or satellite television reception.

Cumulative effects

10.4.16 The cumulative effects assessment consisted of the following:

- examining the location of the Proposed Development with respect to the developments listed in Appendix A5 and identifying the developments which may have a potential for cumulative effects; and
- analysing the impact of the developments identified above and corresponding effect, if any.

10.4.17 The assessment is outlined in Section 10.11.

10.5 Assumptions and limitations

10.5.1 The maximum heights and massing parameters have been applied to the assessment. This provides a worst-case assessment of the likely effects during the

[61] https://www.ons.gov.uk/census/2011census/2011censusdata/bulkdata
[62] https://www.ofcom.org.uk/__data/assets/pdf_file/0026/143981/technology-tracker-2019-uk-data-tables.pdf

existence of the Proposed Development. The height information can be found on Parameter Plan EBE-AST-XX-XX-DR-A-011130.

10.5.2 The actual need resulting from the Proposed Development for restoring television services are likely to be well below the estimated number of potentially impacted households identified in Section 10.8, because the following assumptions are implicit in the estimates:

- in the impact areas, identified in Section 10.8, all receiving antennas point in the direction of the corresponding impacted transmitter and there are no receiving antennas pointing in the direction of any other transmitters;
- everyone in the impact area notices the interference effects;
- the interference effects are serious enough to warrant correction; and
- any adverse effects are traceable to the Proposed Development.

10.6 Baseline

10.6.1 Terrestrial television reception in the City of Westminster is mainly from signals received from the Crystal Palace transmitter (LR National Grid Reference TQ339712), located approximately 8.9 kilometres away at a bearing of 143 degrees to the south-east of the site boundary.

10.6.2 The quality of terrestrial television reception achieved is dependent on the equipment used at the receiving site. In many cases, a standard roof-top directional Yagi-type antenna is sufficient to obtain adequate signal reception, although in some cases, a high gain, more directional antenna, and/or masthead amplifier is employed.

10.6.3 Satellite television signals are received from the Astra 2 satellite, which from the Greater London area is located on an azimuth of approximately 146 degrees east from north, and an elevation of 26 degrees; located above the equator at 28.2 degrees east.

10.6.4 It is likely that there is already a deterioration of signals in the vicinity of the site boundary caused by a number of existing tall buildings in the Greater London area. Additionally, smaller structures may cause more localised signal disruption.

10.6.5 In practice, it is quite difficult and almost impossible to identify the existing structures that cause such deleterious effects because they may be located anywhere within a large radius from the area under consideration.

10.6.6 In the future baseline (2028) it is likely that the addition of other tall structures in the vicinity of the site, including the Cundy Street Quarter redevelopment will also affect signal quality in the vicinity of the site boundary.

10.7 Embedded and good practice measures

10.7.1 This section is not applicable to the EMI assessment.

10.8 Assessment

Construction effects

10.8.1 The construction effects of the Proposed Development (Detailed Area and Outline Area) on terrestrial and satellite television reception in the vicinity of the Proposed Development have been scoped out of the assessment.

Existence effects

Satellite television

10.8.2 Given the location and height of the Proposed Development relative to the Astra 2 satellite (used for BskyB service), a signal shadow could be created to the north-west of the Proposed Development. The 'hard' signal shadow has an approximate area of 2ha and stops 20m beyond the Ebury Bridge Road (B313).

10.8.3 As shown in Appendix G, approximately 90% of the 'hard' signal shadow would fall across the site and the Ebury Bridge Road. Hence, the resulting area that may potentially experience disruption in its signal from the Astra 2 Satellite is roughly 0.3ha.

10.8.4 Not all households in the shadowed area will currently be using satellite television. Using the most recent Ofcom Technology Tracker Wave 2019 figures, approximately 34% of households within UK use satellite television as their primary source of television.

10.8.5 Using the Census Output Areas (COA), and persons per household (Census 2011) statistics obtained from the Office for National Statistics, the number of households per hectare for each COA was calculated. Then, the COAs that were within the 'hard' signal shadow (for the Astra 2 Satellite) were identified. Based on the number of households per hectare for each COA, the 'hard' signal shadow area and also considering diffraction effects, which further reduces the impact area, the total number of households likely to be affected as a result of shadowing from the Astra 2 Satellite is 14.

10.8.6 Increasing uptake of cable, internet protocol television (IPTV) and broadband television services is also likely to further reduce the number of households affected by shadowing of satellite television caused by the Proposed Development once it is completed.

10.8.7 Taking all the above into account, effects on satellite television services in the vicinity of the Proposed Development would be **negligible**.

10.8.8 Potential mitigation measures in the areas that may be affected by the shadows caused by the Proposed Development are identified in Section 10.9.

10.8.9 Given the location of the Detailed Area, with respect to the Astra 2 Satellite, there will be no impact on satellite television services within the Detailed Area.

Terrestrial television

10.8.10 Terrestrial television transmissions from the Crystal Palace transmitter has been subject to a detailed investigation as part of the assessment.

10.8.11 The position and massing of the Proposed Development in relation to the position and height of the Crystal Palace transmitter dictates that signal shadows are created to the north-west of the Proposed Development.

10.8.12 The drawing showing the 'hard' signal shadow, where receiving antennas do not have line of sight of the transmitting antenna, can be found in Appendix G.

10.8.13 From initial analysis, the 'hard' signal shadow from the Crystal Palace transmitter continues for approximately 2.3 km north-west of the Proposed Development, stopping 600m beyond South Carriage Drive road. The shadow has an approximate area of 21ha. Approximately 30% of the shadow falls across green spaces (e.g. Hyde Park and Cadogan Place Park) and roads. Hence, the resulting area where households may potentially experience disruption in its signal from the Crystal Palace transmitter is approximately 14ha.

10.8.14 Not all households in the shadowed area will currently be using digital terrestrial television. Using the most recent Ofcom Technology Tracker Wave 2019 figure, approximately 32% of households within UK have terrestrial television as their primary source of television.

10.8.15 Using the COA, and persons per household (Census 2011) statistics obtained from the Office for National Statistics, the number of households per hectare for each COA was calculated. Then, the COAs that were within the 'hard' signal shadow (for the Crystal Palace transmitter) were identified. Based on the number of households per hectare for each COA, the 'hard' signal shadow area and also considering diffraction effects, which further reduces the impact area, the total number of households likely to be affected as a result of shadowing from the Crystal Palace transmitter is 245.

10.8.16 Increasing uptake of cable, satellite, IPTV and broadband TV services is also likely to further reduce the number of households affected by shadowing of terrestrial television caused by the Proposed Development once it is completed.

10.8.17 Taking all the above considerations into account, the Proposed Development may potentially have a **moderate impact** on terrestrial television services from Crystal Palace transmitter due to shadowing of terrestrial television signals.

10.8.18 Potential mitigation measures in the areas that may be affected by the shadows caused by the Proposed Development are identified in Section 10.9.

10.8.19 Given the location of the Detailed Area, with respect to the Crystal Palace transmitter, there will be no impact on terrestrial television services within the Detailed Area.

Operational effects

10.8.20 There are no specific operational effects, beyond existence of the Proposed Development, that will impact terrestrial or satellite television reception.

10.9 Additional mitigation

Satellite television

10.9.1 The following mitigation measures can be introduced to overcome potential adverse effects due to the signal shadowing caused by the Proposed Development:

- Relocating the satellite dish. In some circumstances, relocating the satellite dish to another point in a building may be able to improve the received signal strength sufficiently.
- In the event that the above mitigation measure is not adequate, then viewers may have to receive television services from alternative means. This could be in the following forms, with the choice of service in a particular instance being based on service availability and cost of implementation:
- a digital cable television service; or
- an IPTV or broadband television service (e.g. NOW TV, TalkTalk TV etc.)

Terrestrial television

Using existing services

10.9.2 Shadows are created by the placement of a solid object in the line of propagating waves. As such once a building or structure is in place, the shadows themselves cannot be mitigated. The only factors that can be introduced in order to minimise the effect on local reception in the shadow area are to the actual reception sites themselves.

10.9.3 The mitigation measures that can be introduced in the potentially affected area to overcome the adverse effects due to the signal shadowing caused by the Proposed Development are:

- Improving the receiving antenna. This involves the installation of a new higher gain antenna, with improved directionality. A high gain will increase the received signal strength, which will reduce the effect of shadows. Improved directionality will improve the antenna directional response, thus reducing the impact of reflected signals. The effect of shadows may be circumvented in some instances by making better use of diffracted direct signals and/or using reflected signals from other buildings.
- Installing a mast-head amplifier. In some cases, the received signal might be improved by using a mast-head amplifier. This boosts the received signal at the antenna location.
- Relocating or redirecting the receiving antenna. In some circumstances the interference is extremely localised and relocating the receiving antenna at another point in a building may be able to improve the received signal strength sufficiently. This may be because the effect of shadows is obviated by making better use of diffracted direct signals and/or using reflected signals off other buildings.

- Making use of relay transmitters. Digital television signals from an alternative transmitter may be available at the receiving antenna and they may not be affected by the Proposed Development. An improved, higher gain antenna may be needed to make use of the low power signal.

Using new services

10.9.4 With the mitigation measures mentioned above in place, there may be a small number of residences where their preferred primary source of television is still not available.

10.9.5 Viewers in this situation may have to receive television service from alternative means. This could be in one of the three following forms, with the choice of service in a particular instance being based on service availability and the cost of implementation:

- a digital cable television service;
- a digital satellite television service (BSkyB's new free-to-view service, "FreeSat from Sky); or
- an IPTV or broadband television service (NOW TV, EE TV, TalkTalk TV etc.)

Need for mitigation

10.9.6 The need for implementing mitigation measures arises only when television users, i.e. mainly residential households, notice that their reception has deteriorated, and the deterioration can be directly attributable to the Proposed Development. The mitigation investigations can be carried out whenever a problem is reported during or after construction. This will generally only occur when construction of the development is substantially complete. Additionally, a transmitter signal may be affected, but not enough to cause interruption to the service. This study identifies where a signal may be affected, which does not necessarily mean the service will be affected.

10.9.7 Service deterioration can be caused by a number of factors such as the user's antenna, the antenna to receiver cable connection, the receiver, and any buildings and structures in the vicinity of the television user's household. It is only in the event that service deterioration has occurred and the cause is due to the Proposed Development, and not due to any other likely cause, that any mitigation measures would become the responsibility of the developer.

10.10 Residual effects

Construction effects

10.10.1 Construction effects have been scoped out of this assessment.

Existence effects

10.10.2 Given the nature of the potential impacts, with the outlined mitigation measures in place, it is anticipated that all households in the area should be able to receive

an adequate television service (either by terrestrial, satellite, cable, IPTV or broadband). Hence, the residual effect would be not significant.

Operational effects

10.10.3 There are no specific operational effects, beyond existence of the Proposed Development.

10.11 Cumulative effects

10.11.1 The list of developments identified for assessing cumulative effects is presented in Appendix A5.

10.11.2 From analysis of the developments identified in Appendix A5:

- None of these are located within the Astra satellite signal shadow identified.
- Only one development, Cundy Street Quarter, is located within the Crystal Palace transmitter signal shadow identified. The EIA for Cundy Street Quarter does not include an EMI assessment and hence it is not apparent whether this development could impact terrestrial television reception from the Crystal Palace transmitter and its significance. However, given that the Proposed Development is taller than Cundy Street Quarter, and its location within the Crystal Palace transmitter signal shadow of the Proposed Development, any potential shadow created by Cundy Street Quarter would potentially fall within the Crystal Palace transmitter signal shadow identified.

10.11.3 Therefore, the assessment in Section 10.8 is still valid.

10.12 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the Proposed Development						
Scoped out						
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Satellite television reception	Potential deterioration in satellite television caused by signal shadowing to the Astra 2 Satellite.	Negligible (Long-term)	Not significant	Repositioning satellite dish. Use of alternative service	Not significant	Not significant
Terrestrial television reception	Potential deterioration in digital terrestrial television caused by signal shadowing to the Crystal Palace transmitter.	Moderate (Long-term)	Significant	Repositioning or improving receiving antenna. Use of alternative services.	Not significant	Not significant
Use/Operation – effects arising from the use of the Proposed Development						
Scoped out						

11 Environmental wind

11.1 Introduction

11.1.1 This section describes the likely significant effects of the Proposed Development on environmental wind. It outlines the methodology, the baseline conditions and the likely significant environmental wind effects associated with the existence and operation of the Proposed Development. Mitigation measures which would be implemented to reduce the effects of the Proposed Development on environmental wind are also described, where relevant.

11.2 Scope of the assessment

11.2.1 The scope for the assessment of environmental wind is summarised in Table 28.

Table 28: Environmental wind assessment scope

Assessment	Construction	Existence	Operation
Pedestrian Wind Comfort and Pedestrian Wind Safety	n/a	✓	✓

11.2.2 A Scoping Opinion was received from WCC on 6th December 2019. This included no comments relating to environmental wind.

11.3 Consultation

11.3.1 No consultation was undertaken for this assessment.

11.4 Methodology

Overview

11.4.1 This section outlines the methodology for assessing the likely significant effects on environmental wind from the existence and operation of the proposed development.

Baseline methodology

11.4.2 The baseline in this assessment describes the wind conditions experienced within the existing site and immediate surroundings, prior to any approved demolition on site. The baseline includes the effect of the current wind environment on pedestrian, cyclist and vehicular users (receptors), both within the site boundary and within the immediate vicinity of the site (i.e. surrounding streets).

11.4.3 The baseline was initially assessed using a qualitative desk-based study, created using professional wind engineering experience and judgement. A 1:300 scale model of the site and existing surroundings was then constructed and placed in a boundary layer wind tunnel for testing. The wind tunnel data were processed and interpreted by Arup. Gust and mean speeds were obtained using Irwin probes for

sixteen equal increments of wind direction. The probe locations were selected either due to wind sensitivity of the expected activity in the area (building entrances, external seating, etc.) or because the site geometry suggested the possibility of undesirable wind conditions.

11.4.4 The measured wind speed ratios were combined with the wind statistics for London to calculate seasonal and annual levels of windiness according to the 'comfort' and 'distress' limits in the Lawson Criteria. These Criteria define appropriate levels of windiness according to the type of activity being performed in the area and levels of windiness that may cause distress.

Criteria

11.4.5 The criteria used to describe windiness in this assessment are the Lawson criteria, developed for the London Docklands Development Corporation (LDDC)[63]. The Lawson criteria are used widely in the UK and around the world. These criteria are useful to describe windiness in terms of acceptability for particular activities. The Lawson criteria are intended for areas used regularly, but not so applicable to areas of 'good weather use'.

11.4.6 Acceptable comfort conditions for various activities in order of increasing windiness are described in Table 29.

Table 29: Lawson LDDC comfort criteria

Criteria	Description
'Sitting'	Reading a newspaper, eating and drinking
'Standing' or short term sitting	Appropriate for building entrances, bus stops, window shopping, and parks
'Strolling'	General areas of walking and sightseeing
'Business Walking'	Local areas around tall buildings where people are not expected to linger

11.4.7 In the following assessment the words 'Sitting', 'Standing', 'Strolling' and 'Business Walking' are used to describe comfort levels of windiness of Table 29.

11.4.8 As shown in Table 30, there are also distress criterion.

Table 30: Lawson LDDC distress criteria

Distress Criteria	Description
'General Public Access'	Members of the general public and cyclists are expected to be able to access the area safely in normal windy weather
'Able-bodied Access'	The less able and cyclists may at times find conditions physically difficult
'Restricted Access'	It may become impossible at times for an able-bodied person to remain standing

[63] TV Lawson of Bristol University, extracted from "The evaluation of the windiness of a building complex before construction", TV Lawson, London Docklands Development Corporation

11.4.9 In the following assessment the phrases 'general public', 'able-bodied' and 'restricted access' are used to describe safety levels of windiness as described in Table 30.

Construction effects

11.4.10 There is no assessment of the wind environment within or around the Proposed Development during the construction scenario. This is because wind mechanisms from developments do not fully develop until the external cladding is installed on the buildings.

Existence, operational and cumulative effects

11.4.11 The methodology for determining the existence, operational and cumulative effects has been determined with physical wind tunnel testing, supplemented with qualitative desk studies where appropriate.

11.4.12 The effects of wind microclimate take account of both the wind conditions and the activities of the users (people, cyclists, and vehicles) experiencing those wind conditions. The assessment of one is only relevant when compared to the other. Therefore, existence effects (created by the physical presence of the development) and operational effects (created through the use of the site by pedestrians, cyclists and vehicles) are considered the same.

- The assessment evaluates the likely comfort and safety of users of the external spaces within the site and in the immediate surrounding area. More detail has been given to the detailed elements in each phase;
- Baseline wind condition and initial condition for each scenario have been tested;
- Physical mitigation options were developed and tested if unsafe or uncomfortable wind conditions were recorded;
- Sixteen wind directions have been tested (22.5° each) for each run to satisfy the requirements for the LDDC Lawson criteria;
- The wind data (strength and frequencies) used in the wind tunnel are the LDDC data which have been adjusted from Holborn and then corrected to the site using the ESDU methodology[64]; and
- Irwin probes[65] have been used in the wind tunnel tests to measure wind speeds at pedestrian height (usually about 1.5m above ground). These speeds have been used to create speedup ratios[66] that will be combined with wind data to determine the wind conditions around the Proposed Development. These findings have been compared with the Lawson LDDC criteria for comfort and safety to assess their suitability.

[64] Methodology for estimating the effects of topographic roughness. Definition included in the terminology section of the appendix.
[65] Measurement device for measuring wind speeds at model scales. Definition included in the terminology section of the appendix.
[66] Ratios used to translate wind speeds taken around the model to full scale wind climates. Definition included in the terminology section of the appendix.

11.4.13 The study area has been defined as any area where the wind environment is thought to be affected by the Proposed Development.

11.5 Assumptions and limitations

11.5.1 The qualitative assessments are based on professional judgement and cannot be used for quantitative analysis.

11.5.2 Pedestrian wind comfort is based on the Lawson LDDC criteria for seasonal wind comfort (winter as the worst case and summer as the calmest case). This is based on a 5% exceedance and is widely used within the UK as it is considered a conservative approach. Annual conditions have not been assessed as this is also based on a 5% exceedance and as such provides a less conservative result.

11.5.3 The Lawson LDDC criteria for safety is based on a 0.025% exceedance over a year, or once per year. The distress limit for 'General Public Access' corresponds to an equivalent mean speed of 15 m/s and gust speed of 28 m/s. The limiting distress criterion for 'Able-bodied' corresponds to a mean speed of 20 m/s and a gust speed of 37 m/s.

11.5.4 Wind conditions in the wind tunnel can only be measured at finite locations, where the probes are installed. The conditions between probes is unknown. Experience and expert judgment are used to qualitatively assess areas where recordings have not been taken.

11.6 Baseline

11.6.1 Wind conditions on the existing site are assessed using the existing wind climate data below. Figure 7 below shows statistical, mean hourly wind speeds and wind directions represented in the London LDDC data, and adjusted to the site using the ESDU methodology. These wind roses represent the wind behaviour (direction, frequency and speed) across all times of day for each season.

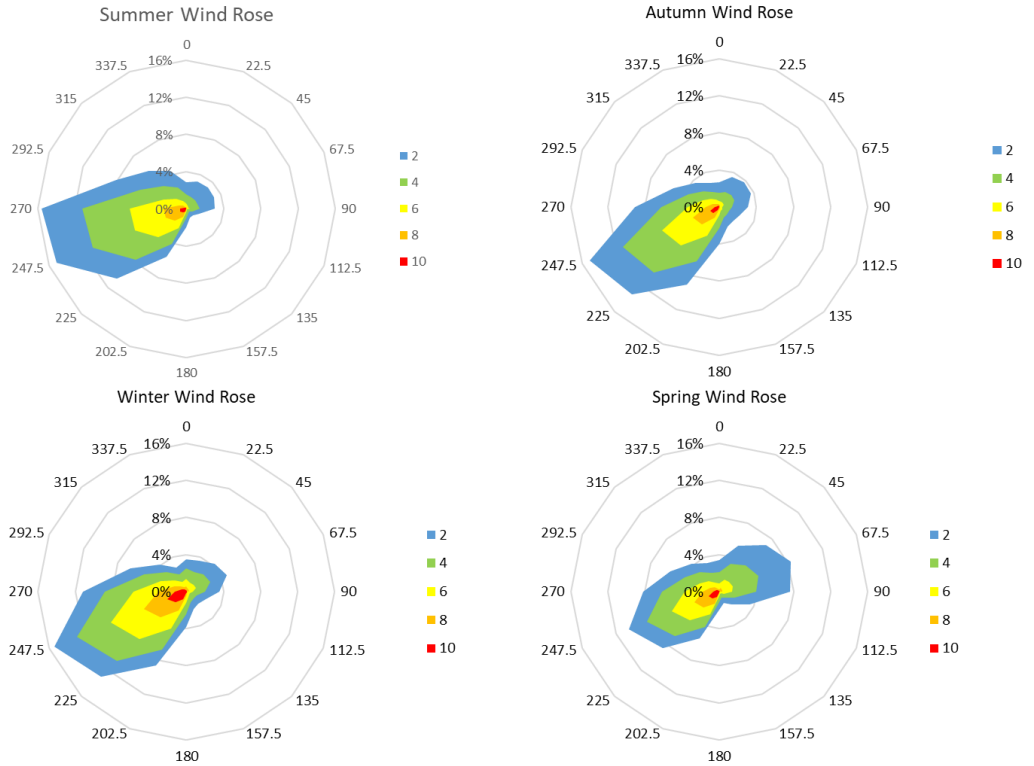

Figure 7: Assessment wind roses[67]

11.6.1 Overall, the wind climate in London is similar to the rest of the UK:

- The westerly winds are the most frequent and strongest winds in London at all times of the year. These winds are relatively warm and wet. Most cases of serious annoyance due to strong winds around buildings are caused by these winds;
- North-east winds are almost as common as the south-west winds during the spring but are weaker. They are often associated with cold dry conditions. North-east winds can be more unpleasant than suggested by their strength due to the lower than average air temperature;
- Winds from the north-west can be as strong as the south-west winds but are less frequent. They are relatively cold and can bring snow in winter; and
- South-east winds are generally warm and light and are rarely associated with uncomfortable ground level winds.

11.6.2 The results from the wind tunnel test of the existing site and surroundings are shown in Figure 8.

[67] Created using historical wind data from several London airports, including Heathrow and London City airports.

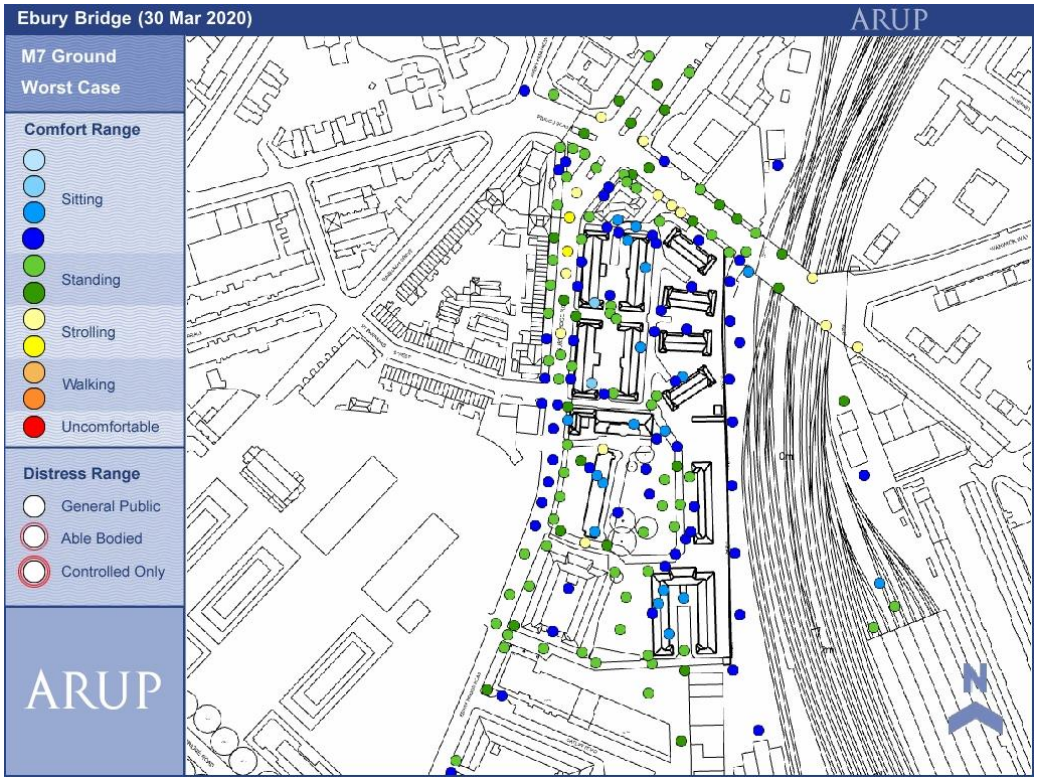

Figure 8: Plot of the worst-case wind conditions in the existing scenario recorded in the wind tunnel.

11.6.3 The existing site is generally sheltered from oncoming winds. It is slightly exposed to the prevailing south-west winds before the Chelsea Barracks development is completed and also to the south-east, across the train tracks.

11.6.4 Conditions in the existing site and surroundings are within the 'Sitting' to 'Strolling' range and there are no safety exceedances. Therefore, the effect of existing wind conditions on the existing site are considered negligible.

11.6.5 The future baseline (existing site in 2028 surroundings) was not tested in the wind tunnel. Therefore, the possible effects have been qualitatively assessed using professional judgment, with reference to the wind assessment submitted for the Cundy Street Quarter (CSQ) application (20/03307/FULL).

11.6.6 Conditions within the site are expected to be within acceptable 'Sitting' to 'Standing' ranges and some conditions outside the site, particularly in front of ENI House, along Ebury Bridge Road, are expected to be in acceptable 'Strolling' to 'Business Walking' ranges. Conditions in the future 2028 baseline are therefore expected to be **negligible**.

11.7 Embedded and good practice measures

11.7.1 Many potential adverse wind microclimate effects have been avoided or reduced through design. Factors such as massing, orientation and grouping have all been adjusted to manage wind mechanisms.

11.7.2 Objects or other structures upwind of a building can help shelter it from direct winds. This is achieved in the development by both gradually building up the

heights of structures from west to east to the maximum proposed height and by building neighbouring elements of the Proposed Development up to a similar height, to create local shelter (see Figure 9).

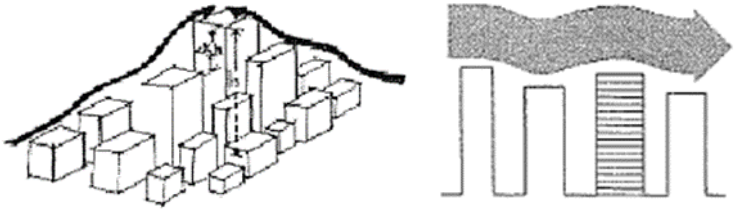

Figure 9: Example sketches of building groupings that provide cumulative and local sheltering

11.7.3 Massing configurations and orientations were discussed with the design team early in the design process to reduce the impact from wind. From these discussions, the orientation of the tower massing was informed to include a south-west to north-east orientation and podiums were included between each. This both reduces the available façade area exposed to prevailing south-west winds but also keeps accelerated winds above ground level.

11.7.4 These design decisions are instrumental in creating calm conditions within the Ebury Bridge Estate Masterplan.

11.8 Assessment

Existence and operational effects: Detailed Area

11.8.1 A 1:300 scale model of the proposed Detailed Area in existing surroundings was constructed and placed in the boundary layer wind tunnel for testing. The Detailed Area was tested with landscaping and meanwhile structures in place (see Figure 11 to Figure 13) and the existing landscaping to the north of the site (including the bus shelter) were also included. The worst case conditions were found to exist when the existing buildings were retained in the Outline Area.

11.8.2 Conditions in this scenario are shown in Figure 10 and are in the ‘Sitting’ to ‘Strolling’ range with a single point recording ‘Business Walking’ at the western corner of Block 7.

11.8.3 The ‘Business Walking’ conditions at this location are the highest wind speeds both on and off-site. There are no sensitive activities expected in the affected area (i.e. cafes or main entrances) and it is intended as a passage through the site. Therefore, ‘Business Walking’ conditions are acceptable and **not significant**.

11.8.4 Conditions across all other areas of the site and surroundings are calmer and are also acceptable for the expected uses (entrances, leisure spaces and general access). The conditions for both existence and operational effects for the Detailed Area are therefore **not significant**.

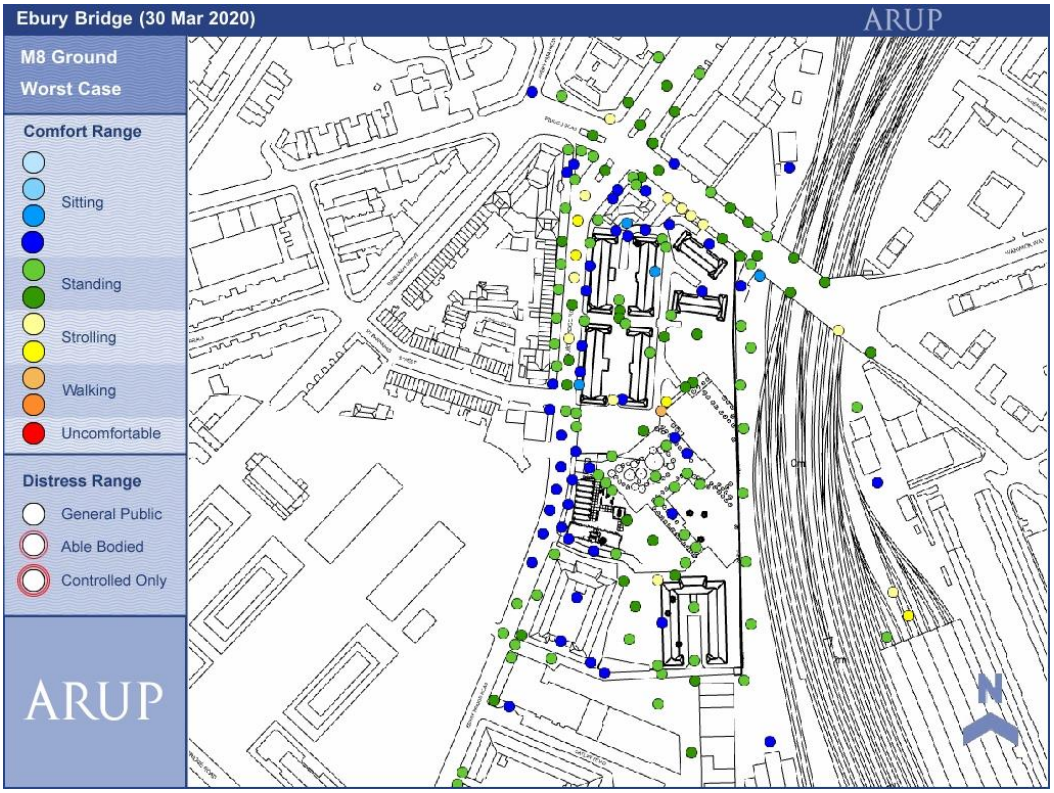

Figure 10: Plot of the worst-case wind conditions in the Detailed Area, recorded in the wind tunnel

Figure 11: Photo of the model of the Detailed Area used in the wind tunnel (view looking east)

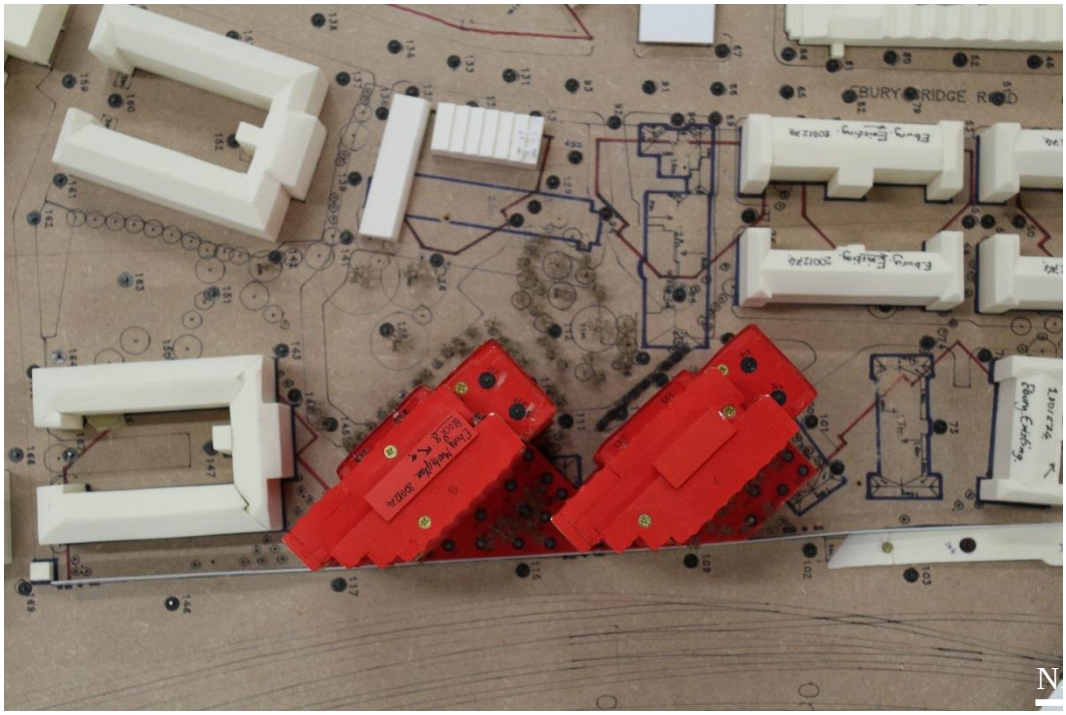

Figure 12: Photo of the landscaping and buildings modelled in the wind tunnel for the Detailed Area.

Figure 13: Photo of the existing landscaping and bus shelter along Ebury Bridge that were modelled in the wind tunnel.

Existence and operational effects: Outline Area

11.8.5 The entire masterplan was tested with the Detailed and Outline Areas in existing surroundings. Landscaping was included in the Detailed Area (podium and ground levels) and offsite to the north (as in the previous scenario). The Outline Area was tested without landscaping.

11.8.6 A photo of the model in the tunnel is shown in Figure 15 below. The results of this scenario showing the worst-case are shown in Figure 14.

11.8.7 Conditions within the site improve so all areas are in the 'Sitting' to 'Strolling' range and all areas have acceptable conditions for the intended activities. The effects are therefore **not significant**.

11.8.8 Wind speeds off-site increase towards the north of the test area, affecting Ebury Bridge Road and an existing bus stop on Ebury Bridge. This is due to prevailing south-west winds being sucked behind the northern most tower of the Outline Area and being channelled east along Ebury Bridge Road by the existing building north of the road.

11.8.9 Conditions at the bus stop are one comfort category higher than suggested in the criteria. These conditions are safe but would benefit from local off-site mitigation. Conditions at the bus stop are therefore **moderately adverse significant**.

11.8.10 Conditions in all other areas off-site are acceptable for all expected uses and are **not significant**.

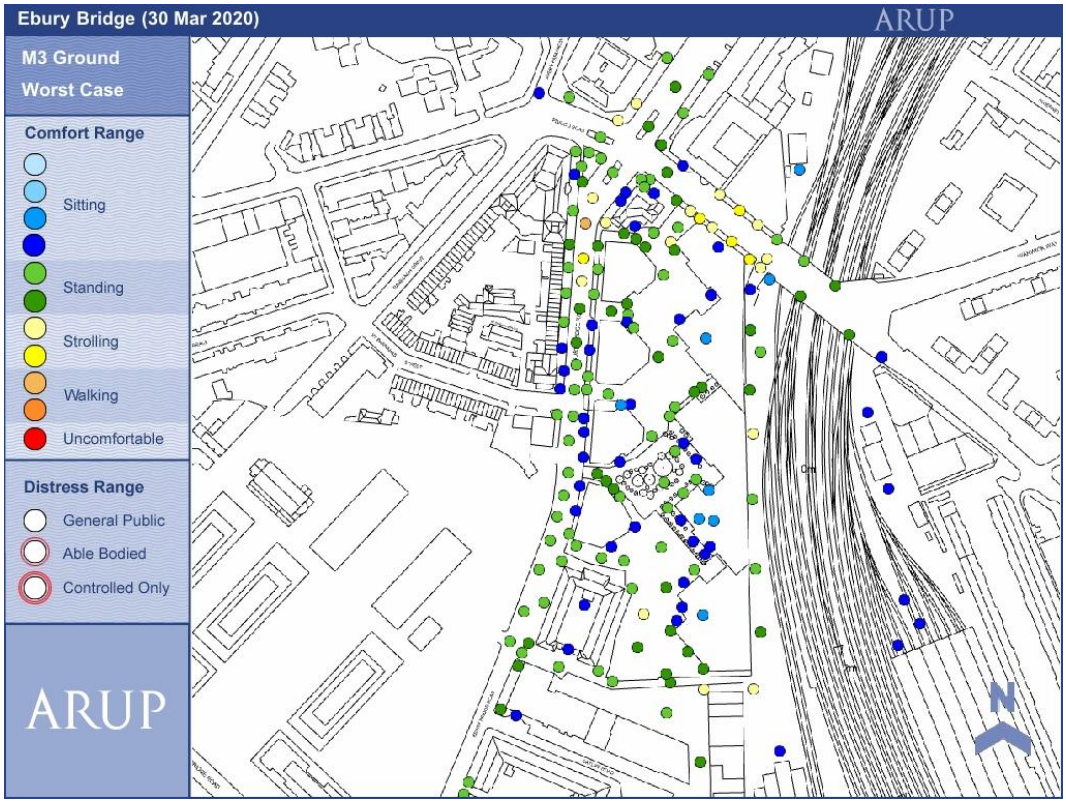

Figure 14: Plot of the worst-case wind conditions with the completed masterplan (worst case)

Figure 15: Photo of the model of the complete masterplan used in the wind tunnel (view looking east)

11.9 Residual effects

Detailed Area: existence and operational effects

11.9.1 No mitigation has been proposed with respect to existence effects related to the environmental wind in this phase. As such the effects would be as reported in Section 1.8.

Ebury Bridge Estate Masterplan: existence and operational effects

11.9.2 Conditions within the proposed masterplan are acceptable for all uses and are therefore **not significant**. Conditions off-site at the bus stop on Ebury Bridge remain **moderately adverse significant**. Conditions at the bus stop are a comfort issue, not a safety issue.

11.10 Cumulative effects

11.10.1 The list of developments identified for assessing cumulative effects is presented as Appendix A5. In Table 31 the potential for cumulative effects with each of these developments is examined, and an assessment of the cumulative effects presented where appropriate.

Table 31: Environmental wind cumulative effects

Development	Potential for significant cumulative effects	Comments
Cundy Street Quarter	Yes	Details of the development were not known at the time the wind tunnel tests were carried out. Therefore, the possible effects have been qualitatively assessed using professional judgment, with reference to the wind assessment submitted for the Cundy Street Quarter (CSQ) application (20/03307/FULL). The CFD assessment for Cundy Street Quarter shows an increase in windiness, from 'Standing' to 'Strolling' along a section of Ebury Bridge Road when the development is completed in existing surroundings (i.e. without Ebury Bridge Estate Masterplan). This is likely due to the grouping of the existing (ENI House) and proposed CSQ tower elements. The results of the Ebury Bridge Estate Masterplan show higher wind speeds in this area in the baseline but a smaller increase in wind speeds when the masterplan is in place. 'Strolling' to 'Business Walking' conditions are recorded in a similar location along Ebury Bridge Road when the Outline and Detailed elements are constructed in existing surroundings (i.e. without CSQ). The effect occurs only once the Outline Area comes forward, and will not otherwise be impacted upon by the development of the Detailed Area. It seems clear from these two studies that some increase in windiness will result when both developments come forward. However, it is unclear if the magnitude of change will result in unacceptable wind conditions. This could therefore be the subject of a pre-commencement condition specific to the Outline Area.
Thames Tideway	No	Most of the development is not above ground and therefore does not affect the pedestrian level wind climate. The two above ground

Development	Potential for significant cumulative effects	Comments
Tunnel, Tideway		sites are also too far away (over 600m) from the site to impact the local wind conditions.
Chelsea Barracks, Qatari Diar	Yes	Without onsite landscaping, moderate significant effects. With onsite landscaping (see below), no significant effects.
Battersea Power Station, Battersea Power Station Development Company	No	The development massing change is significant but far enough away from the site (over 900m) that it will not impact the wind conditions at Ebury Bridge Estate site.
Cringle Dock Waste Transfer Station, Western Riverside Waste Authority	No	The development is far enough away from the site (over 900m) that it will not impact the wind conditions at Ebury Bridge Estate site.

11.10.2 The Chelsea Barracks scheme was modelled and tested in the wind tunnel workshop. Landscaping was included in the Detailed Area (podium and ground levels) and offsite to the north (as in the previous scenario). The Outline Area was tested without landscaping. Details of the Cundy Street Quarter development were not known at the time the wind tunnel tests were carried out. Therefore, the possible effects have been qualitatively assessed using professional judgment.

11.10.3 A photo of the test model for the cumulative scenario is shown below as well as a plot of the worst-case results (Figure 16).

11.10.4 In this scenario, a **moderate to major adverse significant** effect was identified at an entrance to building B1, where ‘Strolling’ conditions were experienced. The increase is likely do to prevailing south-west winds being funnelled between Blocks B1 and B2. A 5m tall tree placed close to the entrance (see Figure 18 below) was successful in providing local shelter and improving conditions to within an acceptable ‘Standing’ range.

11.10.5 With this landscaping in place, conditions across the site are acceptable for the intended used. Both the existence and operational effects are therefore **not significant**. Conditions off-site at the bus stop off-site on Ebury Bridge are **moderately adverse significant**. After discussions with the planning authorities, no mitigation is proposed as there is not a safety issue.

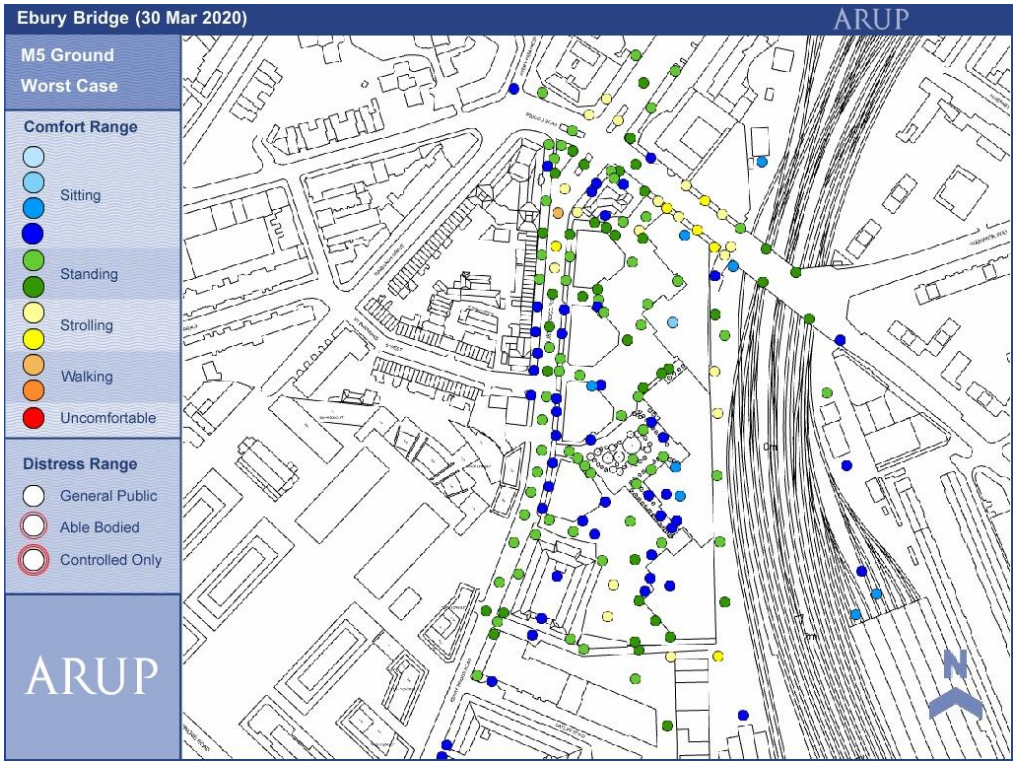

Figure 16: Plot of the wind results around the masterplan in future surroundings, with landscaping (worst case)

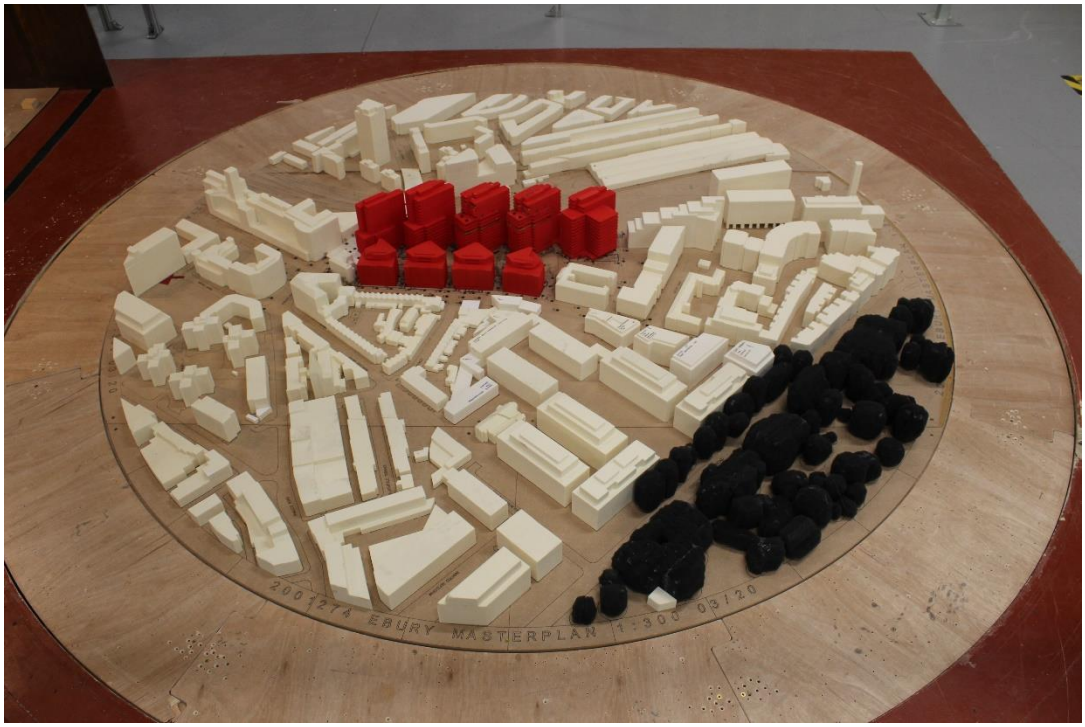

Figure 17: Photo of the masterplan model in the wind tunnel in future surroundings (view from the west)

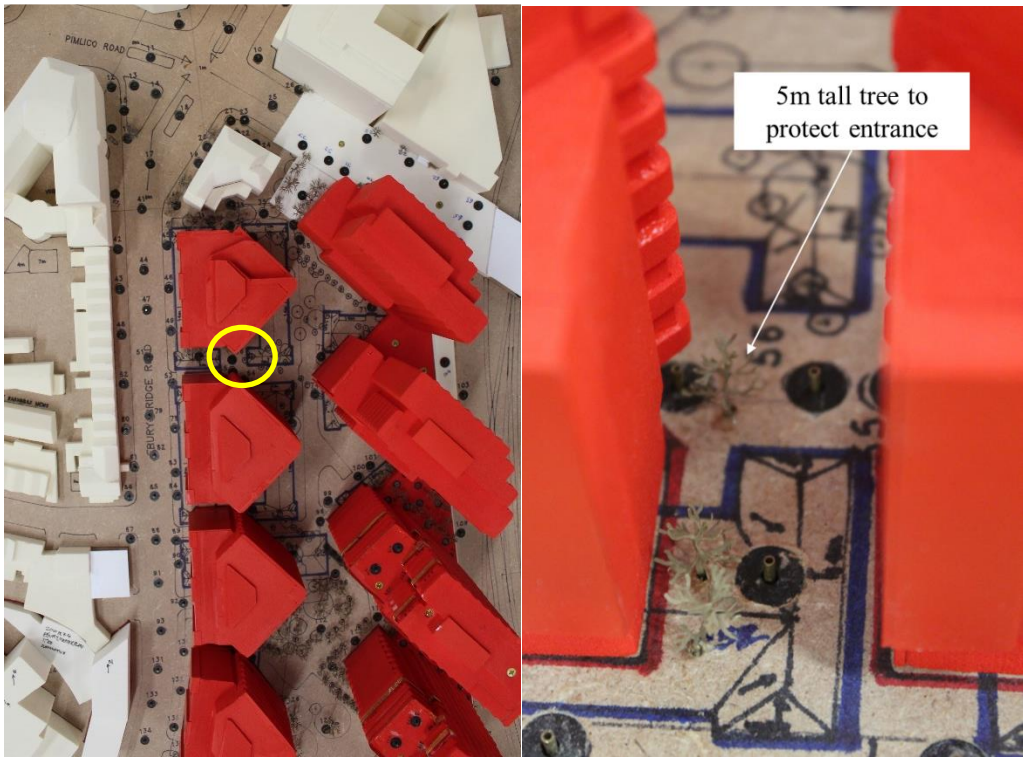

Figure 18: Location of proposed mitigation landscaping included in the tests for the Outline Area.

11.11 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Scoped out						
Existence - effects that arise due to the physical presence or existence of the proposed development & Use/Operation – effects arising from the use of the development						
Users of the Detailed Areas and the immediate surroundings (pedestrians, cyclists and vehicles)	Modified wind patterns around the proposed development, Long-term	Negligible	Not significant	None	Not Significant	Negligible
Users of the Ebury Bridge Estate Masterplan and immediate surroundings (pedestrians, cyclists and vehicles)	Modified wind patterns around the proposed development, Long-term	Increased wind speeds north of the development, along Ebury Bridge Road created by prevailing south-west winds. Safe but possibly uncomfortable conditions.	Moderate adverse significant	None	Moderate adverse significant	Increase in wind speeds close to a single entrance in Block B1, above the acceptable range. The increase is likely do to prevailing south-west winds being funnelled between Blocks B1 and B2. These winds can be reduced to acceptable conditions for 'Entrances' with the inclusion of local landscaping as discussed in Section 11.10. Possible increase in wind conditions along Ebury Bridge Road, close to ENI House, when the Cundy Street Quarter development is constructed. However, it is unclear if the magnitude of change will result in unacceptable wind conditions. Further quantitative analysis such as wind tunnel testing could be used to identify and resolve any possible issues. This could therefore be the subject of a pre-commencement condition specific to the Outline Area.

12 Health

12.1 Introduction

12.1.1 This section describes the likely significant effects of the Proposed Development on health. It outlines the methodology, the baseline conditions and the likely health effects associated with the construction, existence and operation of the Proposed Development. Mitigation measures which would be implemented to reduce the effects of the Proposed Development on health are also described, where relevant.

12.2 Scope of the assessment

12.2.1 The NHS London Healthy Urban Development Unit (HUDU) Rapid Health Impact Assessment Tool[68] and the IMPACT Urban Health Impact Assessment Methodology[69] have been used to inform the assessment and ensure that relevant health determinants have been scoped. The assessment covers the potential health effects resulting from impacts on health determinants within the construction and operational phases of the Proposed Development, including existing residents and early occupants.

12.2.2 The proposed scope for the assessment of health is summarised in Table 32. An explanation about what is covered under each health determinant is provided in Appendix I2.

Table 32: Health assessment scope

Health determinant scoped in	Construction	Existence	Operation
Housing quality and design	n/a	n/a*	✓*
Access to healthcare services and other social infrastructure	n/a	n/a*	✓
Access to open space and nature	✓	n/a	✓
Air quality, noise and neighbourhood amenity	✓	n/a	✓
Accessibility and active travel	✓	n/a	✓
Crime reduction and community safety	✓*	n/a*	✓
Access to healthy food	n/a	n/a	✓
Access to work and training	✓	n/a	✓
Social cohesion and inclusive design	n/a	n/a*	✓
Minimising the use of resources	n/a	n/a	n/a
Climate change	n/a	n/a	n/a

[68] Available from: https://www.healthyurbandevelopment.nhs.uk/wp-content/uploads/2017/05/HUDU-Rapid-HIA-Tool-3rd-edition-April-2017.pdf
[69] Dreaves H, Pennington A, Scott-Samuel A (2015) Urban Health Impact Assessment methodology (UrHIA). Liverpool: IMPACT, University of Liverpool. www.healthimpactassessment.co.uk

12.2.3 The scope of the assessment varies slightly from that agreed in the Scoping Report (changes are marked with an asterisk in Table 32). This is a structural change only and has not influenced the outcome or scope of the assessment. For example, the potential effects that were to be assessed as 'existence' effects under housing quality and design, are actually now assessed as operational effects as it was deemed that the mere existence of these factors (i.e. the existence of additional affordable housing), without their operational elements (i.e. the existence and availability of improved affordable housing being used by residents), would not result in health outcomes to people. Where necessary, such changes are highlighted throughout the assessment.

12.2.4 WCC's Scoping Opinion made no comments on the health assessment.

12.2.5 As part of the redevelopment process, existing social tenants will be rehomed, or 'decanted' from their properties to allow for the construction of the Proposed Development. The decanting process is not part of this application and therefore any potential health effects arising from this decanting process have been not been assessed in this chapter. However, Westminster has a city-wide policy on decanting[70], which aims to set a clear approach to managing proceedings in an efficient and fair manner on renewal scheme development.

12.3 Consultation and engagement

12.3.1 The health assessment has been informed by the outcomes of the community stakeholder consultation strategy led by Westminster City Council Ebury Bridge Community Engagement Team, and by technical stakeholder engagement with Westminster City Council Public Health Team, North West London Clinical Commissioning Group and NHS London Healthy Urban Development Unit.

12.3.2 Consultations took place in the form of meetings and email correspondence with Arup between October 2019 and January 2020.

12.3.3 The main outcome of the consultation was that there was a general agreement on the scope of the assessment. Some minor suggestions were made and have been included in the assessment. These include:

- the use of the HUDU checklist issued October 2019;
- consideration of Lifetime Neighbourhoods and Dementia Friendly Communities; and
- consideration of additional documents to inform the baseline and evidence review.

12.4 Methodology

Overview

12.4.1 This section outlines the methodology for assessing the likely significant effects on health from the construction and operation of the Proposed Development. Full

[70] City of Westminster, 2015. *Westminster City Council's Tennant Decant Policy for Renewal Areas.* Available from: http://transact.westminster.gov.uk/docstores/publications_store/housing/tenant_decant_policy.pdf

details of the methodology, including how relevant key legal requirements, planning policy and guidance have informed the assessment; definition of health determinants; impact magnitude; population sensitivity, and significance criteria that has been applied and any relevant assumptions and limitations, can be found in Appendix I1.

Baseline methodology

Population profile

12.4.2 A baseline population profile for the health assessment study area for the Proposed Development (see Figure 19) was compiled using publicly available data (Appendix I2). This has focused on population demographics, socio-economic status and health indicators in line with the health determinants scoped into the assessment. Vulnerable groups within the population, who may be particularly susceptible to health effects, have been identified.

Study area

12.4.3 The study area for the health assessment is based on the spatial distribution of the likely environmental and economic impacts of the Proposed Development on health determinants, and the location of sensitive receptors.

12.4.4 Baseline data has been collected for six Lower Super Output Areas (LSOAs) close to the site of the Proposed Development, and for the Churchill Ward within which the site is located.

12.4.5 Figure 19 depicts the study area for the health assessment and shows how it is comprised of the local community area (which includes the two LSOAs within which Ebury Bridge Estate is located and parts of the Churchill Ward), the wider community area (the other four LSOAs and parts of the Churchill Ward) and the borough area.

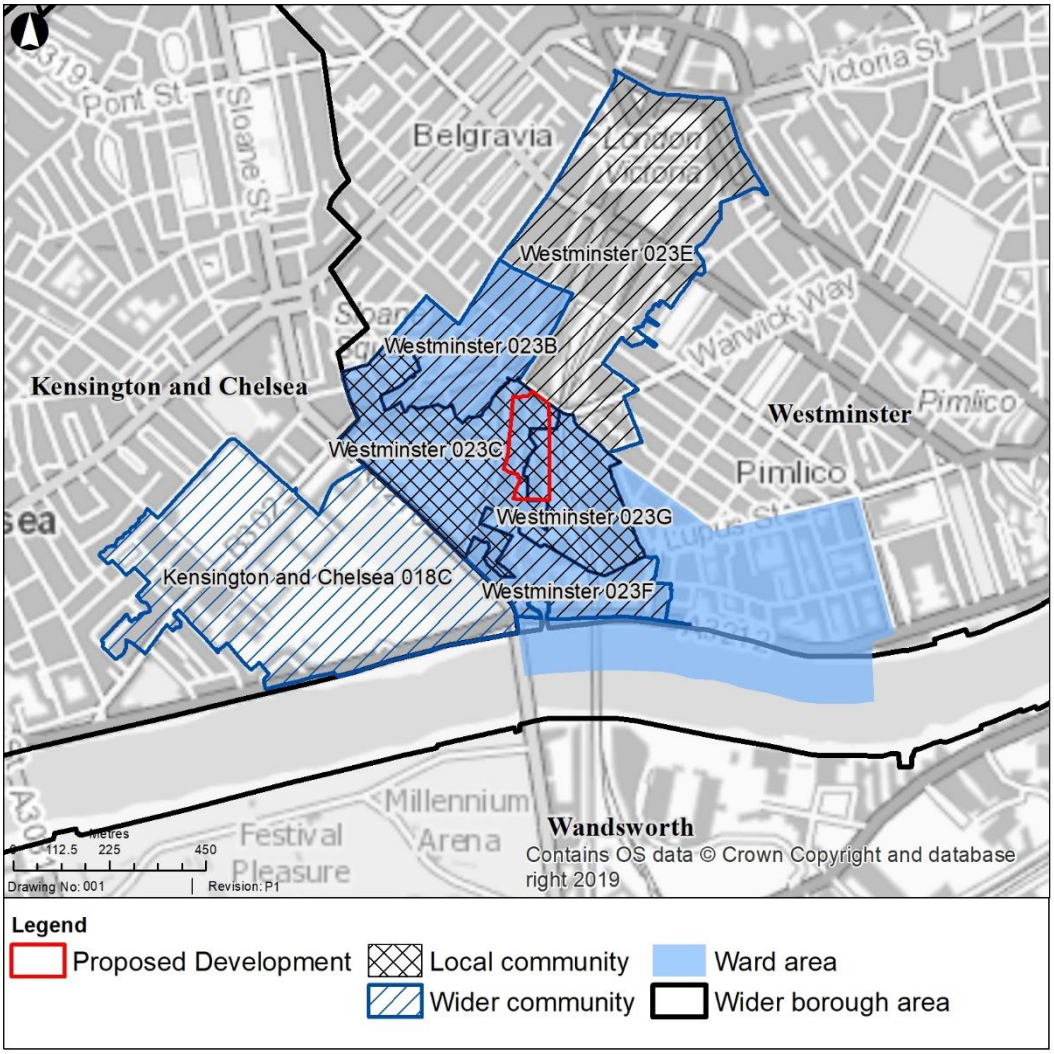

Figure 19 Study area for health assessment.

Baseline and assessment years

12.4.6 The baseline and assessment years used in this assessment are presented below with the rationale presented in Appendix I1.

- Baseline year: the baseline profile is based on the most up to date, publicly available data, published between 2011 and 2020. This baseline presents the 'historic' baseline, that is prior to any decanting or demolition. This reflects the worst-case scenario. In reality, at the start of construction (mid-2021), Phase 171 of the site will have been decanted, the meanwhile use will be in situ and demolition of the following buildings will have taken place (Wellesley, Wainwright, Hillersdon, Dalton, Mercer and Pimlico Houses). The assessment accounts for these changes to the baseline.
- Construction years: between the years of 2021 and 2027, acknowledging that there will be variation in the magnitude of effects as various blocks are built and occupied throughout this period (including occupiers of the Detailed Area and residents within the Outline Area while early phases are constructed);

[71] See Parameter Plan Ref: EBE-AST-XX-XX-DR-A-011102 for phasing

- Future baseline: This refers to the projected baseline in 2028, if no development were to take place. This includes the demolition of the six buildings under the Prior Approval (Wellesley, Wainwright, Hillersdon, Dalton, Mercer and Pimlico Houses). For the purpose of the health assessment, in terms of population at a community level, this future baseline is not expected to be materially different from the 'baseline year', however, population projections and trends from publicly available sources have been used in this assessment to account for expected changes to local demographics.
- Operational years: 2028 (expected completion date) onwards.

Assessment of health impacts, effects and significance

12.4.7 The health assessment focuses on the impacts of the Proposed Development on the health determinants set out in Table 32 and then on a qualitative assessment of the potential health effects on the population within the study area (Figure 19) informed by the population profile (see Appendix I2 Health assessment baseline).

12.4.8 Each impact on each health determinant was assessed using professional judgement, informed by available evidence (see Appendix I3 Health assessment evidence review) on how the impact affects different population groups, including vulnerable groups.

12.4.9 The approach for defining significance of health effects considers the magnitude of impacts on health determinants arising during construction and operation, and the sensitivity of the population exposed to these impacts. A summary of the approach is provided below, with the full set of criteria provided in Appendix I1.

Magnitude of impact

12.4.10 The magnitude of an impact on a health determinant is based on its severity or scale, that is the degree of change to the health determinant compared to the baseline. This is informed by impact characteristics such as whether it is direct or indirect, adverse or beneficial, short or long-term, permanent or temporary. Magnitude has been assessed on a scale of high, medium, low and very low.

Vulnerability of population

12.4.11 The vulnerability of the population exposed has also been assessed on a scale of high, medium, low and very low, dependent on key indicators in the baseline data.

12.4.12 The two factors of size of population exposed, and the vulnerability of the population, have then been combined to give an assessment of sensitivity on a scale of high, medium, low and very low. These are defined as follows:

- Sensitivity of population refers to the size of the population exposed and its vulnerability; and
- Size of the population exposed is dependent upon the size of the geographical area and/or number of people exposed. This has been assessed on a scale of high, medium, low and very low.

Assessment of significance

12.4.13 The assessments of magnitude of impact on health determinant and sensitivity of population exposed to the impact have then been combined, using the matrix illustrated in Table 33 to determine the significance of health effects.

Table 33 Significance of health effects matrix

Magnitude of impact	Population sensitivity			
	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Minor
Low	Moderate	Minor	Minor	Negligible
Very low	Minor	Minor	Negligible	Negligible

12.4.14 As a general rule, major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement has also been applied where necessary.

12.4.15 Recommendations have been made to improve the health outcomes of the Proposed Development. This includes measures to mitigate the significant adverse effects of the Proposed Development and to enhance the potential beneficial effects on health.

Cumulative effects

12.4.16 The criteria for assessing the significance of cumulative effects are the same as those for assessing the effects described above.

12.5 Assumptions and limitations

12.5.1 Assumptions for the health assessment are summarised below:

- The assessment of impacts on health determinants is informed by residual effects, that is, after mitigation measures have been taken into account, reported by other relevant EIA topics (e.g. air quality (Section 5), heritage, townscape and visual (ES Volume 2), noise and vibration (Section 14) and socio-economics (Section 15). It is assumed that the assessment conclusions from these topics are correct. It is also assumed that any mitigation outlined by these topics would be effective.

12.5.2 Limitations of the health assessment are summarised below:

- The assessment of effects is supported by a review of published research relating to each of the identified health determinants, using the most up to date and credible sources. The evidence for health effects ranges from strong, where this is well supported by research evidence, to weak, where evidence is sparse or conflicting. Consequently, professional judgement is necessary to assess the likely health effects.
- Literature and baseline data used in the health assessment is limited to readily available public and published sources.

- The health assessment can be sure about the impacts on the determinants of health, but there is less certainty regarding the resulting health effects of that impact as it is often dependent on a range of other factors i.e. the Proposed Development may improve opportunities for active travel, but the uptake of those opportunities by the population is less certain.
- Due to the qualitative nature of the health assessment, trends in baseline data are acknowledged in the future baseline.

12.6 Baseline

12.6.1 This section presents a summary of the baseline information obtained for the study area. For a detailed version see Appendix I2.

12.6.2 The study area is comprised of four geographic scales, as shown in Figure 19 and described in Appendix I2 in detail. In summary the four areas include the:

- Ward area, which refers to the Churchill Ward;
- Local community area, which refers to the two Local Super Output Area (LSOAs) (Westminster 023C and 023G) within which the Proposed Development is located;
- Wider community area, which refers to the local community area as well as the surrounding four LSOAs (Westminster 023B, 023E, 023F and Kensington and Chelsea 018C); and
- Wider borough area, which refers to the City of Westminster, the borough in which the Proposed Development is located.

12.6.3 Where relevant, necessary and available, comparison is drawn between baseline data obtained for the study area and London, England or Great Britain.

Population

12.6.4 The estimated population of the City of Westminster is 255,324[72]. The population growth rate of Westminster is projected to be slower than that of the neighbouring Royal Borough of Kensington and Chelsea and that of London.

12.6.5 The population density of the local community area is high – significantly higher than the density of the wider community area, Westminster and London[73].

12.6.6 The local community is ethnically diverse with Asian and Asian-British residents comprising the largest minority group within the local community area[74]. The proportion of white residents within the local community is similar to that of London but higher than that of Westminster.

12.6.7 In 2011, Westminster had a high proportion of children, aged between 5 and 15 years [75], when compared to the wider community area and Westminster.

[72] ONS, 2018. *Mid-year population estimate*. Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/datasets/lowersuperoutputareamidyearpopulationestimates
[73] ONS, 2011. *Census 2011: Population Density.* Available from: https://www.nomisweb.co.uk/census/2011
[74] ONS, 2011. *Census 2011: Ethnic group.* Available from: https://www.nomisweb.co.uk/census/2011
[75] ONS, 2011. *Census 2011: Age Structure.* Available from: https://www.nomisweb.co.uk/census/2011

However, it is expected that by 2036, the proportion of children and young people will have decreased[76] as Westminster's population rapidly ages[76]. Nevertheless, it should be noted that in 2011, the proportion of residents aged over 65 years was lower within the local community than the surrounding wider community.

Summary of vulnerable groups

12.6.8 The most disadvantaged and/or vulnerable groups in the area are predominantly age and income related (children and young people and the elderly and people on a low income, economically inactive or unemployed). People with physical or learning disabilities or difficulties are also considered a vulnerable group.

12.6.9 The most disadvantaged and/or vulnerable groups exhibit a number of characteristics, for example, children living in poverty.

Deprivation

12.6.10 The 2019 English Index of Multiple Deprivation[77] (IMD) measures relative levels of deprivation at the LSOA level and is made up of seven 'domains' of deprivation. Table 34 summarises the deprivation levels for each of the LSOAs within the study area[78], where '1' is the most deprived, and'10' the least.

Table 34 Index of Multiple Deprivation 2019

	Local Community Area		Wider Community Area			
	023C	023G	023B	023E	023F	018C
Overall IMD	3	3	4	5	3	6
Income Deprivation	3	2	3	3	3	7
Employment Deprivation	2	3	3	6	3	10
Education, Skills and Training	7	6	8	10	8	9
Health Deprivation and Disability	5	6	6	7	5	10
Crime	4	7	4	8	7	3
Barriers to Housing and Services	5	2	5	4	3	2
Living Environment Deprivation	1	1	2	2	1	1

12.6.11 As is commonplace in London, there is significant variation in levels of deprivation over short geographical distances. The overall levels of deprivation within the local and wider communities is relatively high.

[76] City of Westminster, 2017. *Health and Wellbeing Strategy for Westminster 2017-2022*. Available from: https://www.westminster.gov.uk/sites/www.westminster.gov.uk/files/uploads/joint-he.pdf
[77] ONS, 2019. *Indices of Deprivation 2019 and 2015*. Available from: https://dclgapps.communities.gov.uk/imd/idmap.html
[78] Where 1 indicates that the LSOA is within the 10% most deprived in the UK, and 10 within the 10% least deprived.

Housing design and affordability

12.6.12 The average number of residents per household is lower in Westminster than in London (2.0 versus 2.5), which could be explained by a higher number of apartments within the city than in London in general (Appendix L).

12.6.13 The rate of overcrowding within the ward area is 12%[79], which is considered to be relatively high. There is a high number of socially rented residences within the ward area, making up 50% of all homes[80].

12.6.14 The median property price in Churchill is £705,000 which is approximately one third lower than in Westminster[79].

12.6.15 There is a total of 336 residential units on the existing site. Two thirds of existing homes do not comply with modern space standards, 25% had dual aspect living spaces and none had any private outside space.

Health and social care services and other social infrastructure

12.6.16 Within the ward area, 93% of the population reports to be in good health[76].

12.6.17 Compared to neighbouring boroughs, Westminster has more people receiving mental health social care services[76].

12.6.18 Community health indicators for the City of Westminster are presented in Appendix I2[81]. Key indicators include:

- Life expectancy in Westminster is higher than in England for both men and women;
- Westminster has a higher proportion of physically active adults and a significantly lower proportion of adults with excess weight, when compared to England. However, the proportion of overweight children aged 10-11 years is higher;
- Westminster has a lower rate of diabetes diagnoses than does England; and
- The percentage of people killed or seriously injured in the roads of Westminster is significantly higher than the figure for England.

12.6.19 There are nine GP surgeries located within a one-mile radius of the Proposed Development, all of which are accepting patients, suggesting that there is sufficient GP capacity. These are listed in full in Appendix L.

12.6.20 Existing onsite community uses include a space of 154 sqm in Edgson House and a 23 sqm community garden building.

[79] City of Westminster, 2018. *Churchill Ward Profile*. Available from: https://www.westminster.gov.uk/sites/default/files/churchill-ward-profile.pdf
[80] ONS, 2011. *Census 2011: Tenure*. Available from: https://www.nomisweb.co.uk/census/2011/ks402ew
[81] Public Health England, 2018. *Westminster Local Authority Health Profile*. Available from: https://fingertips.phe.org.uk/profile/health-profiles/data#page/0/gid/1938132696/pat/6/par/E12000007/ati/101/are/E09000033/iid/11001/age/1/sex/4

Open space and nature

12.6.21 Westminster is able to provide more than the national average of publicly available open space[82], offering over 200 parks and open spaces across the borough, which includes large multi-functional areas, pocket parks and squares[8]. The Proposed Development does not lie within an area of open space deficiency[83].

12.6.22 Within the existing site itself, there are two large areas of open space towards the middle and south of the site. An area of open landscaping with trees and children's play space lies between Edgson House and Hillersdon House. There is also a Multi-Use Games Area (MUGA) between Doneraile House and Cheylesmore House.

12.6.23 Existing open space on site measures 13,525 sqm and is composed of the community garden, access roads and parking, and 'ad-hoc' external spaces around the building curtilages. Therefore, the majority of this open space is poorly defined, has limited levels of usability and low biodiversity value. There is no private open space.

Air quality, noise and neighbourhood amenity

12.6.24 The key source of air pollution present at the Proposed Development site is from road traffic emissions along Ebury Bridge Road. WCC declared the whole borough as an Air Quality Management Area (AQMA). These are areas where air quality objectives are not being met and therefore air pollution is high (Appendix B3).

12.6.25 The noise and vibration chapter (Section 14) identifies the site as a busy urban environment where the baseline noise climate is dominated by a mixture of road traffic from Ebury Bridge Road and Ebury Bridge.

12.6.26 The IMD shows that residents of the local and wider community areas face significant deprivation in terms of their living environment, which includes their internal (i.e. quality of housing) and external environment (i.e. levels of local pollution and traffic accidents) [84].

Accessibility and active travel

12.6.27 The Proposed Development site's inner-city location means that it is easily accessible on foot and is well connected with public transport links, as well as to

[82] City of Westminster, 2018. *Greener City Action Plan 2015-2025 (Year 3 Update October 2018).* Available from: https://www.westminster.gov.uk/sites/default/files/greener_city_action_plan_2015-2025_year_3_update_-_october_2018.pdf

[83] Defined as the percentage and count of residential households within wards, with access to at least one open space by specified type of space, and the amount/proportion of each ward that is open space with and without public access. Refer to Greenspace Information for Greater London (GiGL) for analysis. Available from: https://data.london.gov.uk/dataset/access-public-open-space-and-nature-ward

[84] IMD definitions available from: https://www.doorda.com/glossary/index-of-multiple-deprivation-england/?/seven-domains-of-deprivation

the cycling network. The key routes and facilities have been identified in the draft Travel Plan (Ref: EBR-08).

12.6.28 The draft Travel Plan (Ref: EBR-08) states that the site is located within an area that has a Public Transport Accessibility Level (PTAL) rating of 6b, which is the highest possible score on the scale and indicates an 'excellent' connectivity to the surrounding network. The site is well connected to well-lit, wide footpaths along Ebury Bridge Road and is also well connected to strategic cycling routes.

Crime and community safety

12.6.29 The IMD (Table 34) shows that the local and wider community areas experience varied levels of deprivation in terms of crime, which is not uncommon in this part of London.

12.6.30 Westminster has high levels of reports of violent crime when compared to London. The most common type of crime within the ward area is anti-social behaviour, which accounts for nearly a third of all reported crime. Violence and sexual offence rates are also high within the ward, accounting for nearly a quarter of all reported crime[85].

12.6.31 The proportion of residents within the ward area that feel that crime in their neighbourhood has impacted on their quality of life is higher than the proportion of Westminster residents who feel this way[76].

Access to healthy food

12.6.32 The existing development includes a community gardening space.

12.6.33 There is a Sainsbury's Local to the south of the site and weekly market to the north (Pimlico Road Farmer's Market).

12.6.34 Based on a desktop search, there appears to be a lack of food shops within walking distance of the site, limiting access to affordable, healthy food to residents.

Employment and training

12.6.35 Levels of access to education, skills and training are relatively good, with the local community area in the 60th and 70th percentile of the IMD index (Table 34).

12.6.36 School achievement in Westminster appears to be low, with only 28% of pupils achieving good GCSEs[76].

12.6.37 There is sufficient capacity in the wider borough area for students from early learning through to high school. The socio-economics chapter (Appendix L) describes in detail the provision of educational facilities for early learning, primary and secondary school levels.

[85] Public Health England, 2018. Westminster Mental Health and Wellbeing JSNA. Available from: https://fingertips.phe.org.uk/profile-group/mental-health/profile/MH-JSNA/data#page/1/gid/1938132922/pat/6/par/E12000007/ati/102/are/E09000033

12.6.38 The IMD shows that the local community area faces significant income and employment deprivation, ranking between the top 10% and 30% most deprived in the country (Table 34).

12.6.39 Economic activity data within Westminster is lower when compared to the proportion of economically active people in London and Great Britain[86].

12.6.40 The local community area has proportionality fewer adults in managerial positions, when compared to the wider community and Westminster.

Social cohesion and inclusive design

12.6.41 The ward area appears to have strong community cohesion with 96% of residents stating that they feel they can get along well together[79.]

12.6.42 There is a high number of community facilities within the wider community area for residents to use. These are listed in detail in Appendix L and include youth clubs, children's centres and family hubs.

12.6.43 Within the existing development site there is a playground, a community garden and a multi-use games area (MUGA). The development site is located in an identified area of Play Space Deficiency (Appendix L).

12.6.44 There is an existing and informal gardening club.

12.7 Embedded and good practice mitigation measures

12.7.1 A number of good embedded and good practice mitigation measures have been included in the design of the Proposed Development.

Embedded and good practice mitigation measures for construction effects

12.7.2 Embedded and good practice mitigation measures for construction are summarised below.

12.7.3 A draft Construction Management Plan (CMP) has been developed in in response to WCC's Code of Construction Practice (CoCP)[87] (Ref: EBR-14). The Draft CMP outlines general requirements including construction working hours, construction site layout and housekeeping, fencing and screening, lighting, worksite security, construction support sites, traffic and transport and more. The aim is to provide effective planning, management and control during construction in order to manage potential impacts to people, businesses and the natural and historic environment, thereby mitigating many construction health effects.

12.7.4 A Demolition and Environmental Management Plan (DEMP) forms part of the CMP (Ref: EBR-14) and will be implemented on site to ensure a well-managed demolition process. The DEMP will mitigate many health effects during the

[86] ONS, 2018. *Labour Market Profile for Westminster*. Available from: https://www.nomisweb.co.uk/reports/lmp/la/1946157259/report.aspx?town=westminster
[87] City of Westminster, *Code of Construction Practice* (July 2016) Available at: https://www.westminster.gov.uk/code-construction-practice [Accessed on 24 March 2020]

demolition phase. This relates to Wellesley House, Wainwright House, Dalton House, Hillersdon House, Pimlico House and Mercer House.

12.7.5 WCC has been leading an effective community consultation and engagement strategy for the Proposed Development since July 2017. An onsite community engagement team is currently based on the estate through to the end of construction to assist residents with change and manage expectations.

Embedded and good practice mitigation measures for existence and operational effects.

12.7.6 The design of the Proposed Development has been informed by best practice planning and design standards, as outlined in the Design and Access Statement (incorporating the Design Code) (Ref: EBR-05). These standards include:

- the National Planning Policy Framework (NPPF) 2019;
- the London Plan (2016) consolidated with alterations since 2011 ('current London Plan') and the Intend to Public London Plan 2019;
- the London Housing Design Guide;
- Building Regulations Part M (100 per cent of homes and all communal space will be wheelchair accessible and 90 per cent of homes will be adaptable);
- Secured by Design (silver accreditation, incorporating gold elements where possible); and
- The design will also incorporate core Lifetime Homes principles, including the principles of inclusivity, accessibility and adaptability.

12.7.7 These standards collectively work to improve:

- the accessibility and adaptability of homes and public open space;
- the adaptability of homes to suit a wide range of human needs;
- energy efficiency and human thermal comfort;
- access to services and social infrastructure; and
- overall safety through passive design measures that deter crime and active measures to minimise vehicle speed.

12.7.8 To support access to employment, the Council intends to provide the opportunity for businesses to return to the new development where this is viable and is of benefit to the local community (see EBR-03-A Estate Regeneration Statement). All longstanding businesses (business that have occupied a unit on a lease since at least July 2018) have been offered a right of first refusal for a new unit on the Proposed Development before they come on the market. To qualify, longstanding businesses will need to adhere to a set of criteria, which includes a commitment to social value. This may include the requirement to prioritise employment from the local community.

12.7.9 Wayfinding will be designed to minimise any adverse impact on people with a visual impairment. This will include prominent and central entrances and considered placement and size of signage.

Construction effects

Access to open space and nature

12.7.10 The site has considerable access to open space and nature – Westminster provides more than the national average of public open space: Battersea Park, a 200-acre public park is within walking distance and two public squares (Orange Square and Ebury Square Gardens) are located to the north of the Proposed Development. Evidence shows that access to open space and nature, including proximity and size, positively influences physical and mental health outcomes (Appendix I3). Access will not change during construction, allowing residents of the fully completed blocks B7 and B8 (the Detailed Area) access during construction of the Outline Area.

12.7.11 Although the existing community garden will be lost, it will be re-provided on site as part of the meanwhile use, which will be operational as construction of the Detailed Area begins. Council is working with the existing informal gardening club to determine how this club can evolve and to be inclusive to all residents.

12.7.12 As the overall population on site will reduce during construction, it is expected that, overall, that the quantum open space and nature available will increase on a per capita basis, particularly for those residents remaining in the Outline Area and early occupants the Detailed Area. However, it is possible that ongoing construction works will create a noisy environment that may deter the use of nearby open space or the meanwhile use community garden, though this would occur during specific periods of construction and not throughout the entire construction period.

12.7.13 This is expected to result in a very low impact on the determinant. The population sensitivity has been assessed as low based on:

- Medium population vulnerability (overall proportion of people with a disability is similar to the national average; higher proportion of children when compared to the wider community but lower proportion of elderly people); and
- Very low population exposure.

12.7.14 Therefore, this is likely to result in a **negligible and not significant** health effect.

Air quality, noise and neighbourhood amenity

12.7.15 Neighbourhood amenity refers to the quality of physical external space, both private and public. The construction of the Proposed Development will impact on neighbourhood amenity for residents within the local community area through increased noise, dust, changes in visual amenity and construction and demolition traffic.

12.7.16 Evidence shows that increased noise has the potential to cause annoyance and sleep disturbance, which in turn could impact on wellbeing (Appendix I3). The noise effect from construction and demolition activities on residential receptors in the local area has been assessed as significant adverse by the noise assessment,

(see Section 14 Noise and Vibration) although it is not expected at all times during construction. This specifically relates to:

- Cheylesmore House during site preparation and remediation;
- Occupied existing residential properties during construction of the Detailed Area;
- All receptors except Ebury Place during construction of the Outline Area.

12.7.17 Residents of these developments, particularly children and the elderly could be disproportionately affected by noise as a result of construction activities.

12.7.18 Noise effects from construction and demolition traffic have been assessed as not significant due to the limited number of additional traffic on an already busy road (Ebury Bridge Road). Nevertheless, the physical presence of additional construction and demolition traffic on Ebury Bridge Road, whilst already a busy road, may give rise to perceptions of additional road safety risks, particularly for children, older people and people with a disability in the local and wider area, those residents remaining on site in the future Outline Area and early occupants of the Detailed Area.

12.7.19 Changes in air quality can affect respiratory health (Appendix I3); however, the scale of impact is too small to give rise to any measurable effects on the health of the population. Dust emissions may arise during construction and demolition which may give rise to nuisance and irritation but will be appropriately managed through the draft CMP and DEMP. Nevertheless, it is likely that the community will be concerned about the health effects of construction and demolition emissions, particularly with regard to children's health and people with existing respiratory conditions, and this will contribute to the perception of reduced neighbourhood amenity.

12.7.20 Evidence shows that visual amenity can have an impact on mental wellbeing (Appendix I3). The visual impact of construction and demolition sites will be mitigated through the use of hoarding and through general good housekeeping measures, as set out in the draft CMP (Ref: EBR-14). Approximately 35 metres of green hoarding, hoarding with a public facing live plant wall, will be used to further minimise visual disturbance. Although measures have been taken to minimise visual disturbance, existing residents in the local community area, and for residents of the Detailed Area (blocks B7 and B8), may still feel their environment impacted by this as construction works are ongoing.

12.7.21 The combination of impacts on environmental amenity has the potential to give rise to negative feelings in relation to quality of life and the local environment, and could change behaviours, such as deterring the use of outdoor space, during the entire construction phase. Negative reactions by residents are likely to be reduced by the knowledge that the impacts are temporary and will lead to an improved environment in the longer term.

12.7.22 This is expected to result in a medium magnitude adverse impact on the determinant due to reducing mental wellbeing and quality of life over a medium-term duration, primarily as a result of the significant adverse effect related to noise (see Section 14 Noise and Vibration). The population sensitivity has been assessed as medium based on:

- Medium population vulnerability (higher proportion of children when compared to the wider community but lower proportion of elderly people); and
- Medium population exposure (local community area).

12.7.23 Therefore, this is likely to result in a **moderate adverse** health effect, which is significant.

Accessibility and active travel

12.7.24 Evidence shows that accessibility for local residents to community facilities, public services and employment has a direct positive effect on human health (refer to Appendix I3 for evidence).

12.7.25 This site is in an area with a PTAL rating of 6b, which is the highest possible and indicates an excellent public transport network. This connectivity will remain throughout construction with no expected changes to associated health outcomes across all construction phases (Phases 1, 2 and 3).

12.7.26 Accessibility for local residents to community facilities can play a significant role in promoting or discouraging physical activity and research suggests that most sustained exercise is taken during the course of everyday activities such as travelling to work or going to the shops, rather than specifically for health purposes (Appendix I3).

12.7.27 Overall, active travel trips are not expected to be significantly impacted but it is possible that a minor reduction will be observed. This would result from a potential perceived reduction of road safety by the local community resulting from an increase in HGV movements around the site area. Actual safety risks are not expected to be significant and will be managed through the draft CMP (EBR-14). Approximately ten HGV movements are expected per day, with some periods of higher frequencies, such as during piling works (46 movements per day in 2024 for a period of six months). This would be expected to disproportionately impact young children and the elderly, particularly those who will be early occupants of the Detailed Area (blocks B7 and B8).

12.7.28 Eighteen bicycle loops will be provided as part of the meanwhile use on the site, which could offer some encouragement to maintain active travel.

12.7.29 Seven disabled car parking spaces that are currently provided onsite will be lost during construction, which would reduce overall accessibility for people with a disability during construction. The nearest disabled car park will be 63 metres from the site. However, as there will be fewer residents during the construction phase, the overall demand for these car parking spaces may be reduced.

12.7.30 As part of the already consented meanwhile use of the site, the public realm will be level and fully wheelchair accessible, which will improve accessibility to the community space and gardens during construction.

12.7.31 This is expected to result in a low magnitude adverse impact on the determinant, which is not considered significant – potentially being perceived as a modest, temporary change during construction, experienced by a very small population. The population sensitivity has been assessed as low based on:

- Medium population vulnerability (overall proportion of people with a disability is similar to the national average; higher proportion of children when compared to the wider community but lower proportion of elderly people); and
- Low population exposure (the local community).

12.7.32 Therefore, this is likely to result in a **minor adverse** health effect, which is not significant.

Crime reduction and community safety

12.7.33 Evidence shows that community safety is crucial in determining direct and indirect health and wellbeing outcomes (refer to Appendix I3 for evidence).

12.7.34 Demolition and uncertainty during the planning and construction process has the potential to affect residents' sense of security and safety. This may disproportionality affect early occupants of the Detailed Area during demolition activity within the Outline Area.

12.7.35 Community safety is expected to be managed and mitigated through implementation of the DEMP and CMP. The management plans include measures for site setup and welfare and site access control and security. Site access will be monitored and logged and vehicle control barriers will be in place to protect the public.

12.7.36 Vehicular and pedestrian access to the development will be maintained at all times, as will access to the MUGA and children's playground. Hoarding and fencing will be constructed where necessary. A scaffold pedestrian walkway will be constructed to the west elevation of Wellesley House (on Ebury Bridge Road), to maintain the use of the footpath.

12.7.37 Although measures have been put in place to manage community safety, remaining residents in the future Outline Area and early occupants of the Detailed Area, may still perceive the areas surrounding the construction and demolition site as unsafe. This may be compounded by the fact that the local area already experiences high levels of anti-social behaviour.

12.7.38 This is expected to result in an adverse, low magnitude impact on the determinant – actual safety risks are expected to be manged through DEMP implementation, but perceived safety risks may remain. The effect is expected to be of medium-term duration. The population sensitivity has been assessed as low based on:

- low population vulnerability; and
- low population exposure.

12.7.39 Therefore, this is likely to result in a **minor adverse** health effect, which is not considered significant.

Access to work and training

12.7.40 Evidence shows that there is a strong positive correlation between good employment and income levels, and health – providing psychological benefits,

improving life expectancy and enabling healthier lifestyle choices (refer to Appendix I3 for evidence).

12.7.41 As a result of demolition works under the Prior Approval, there will be a loss of 39 full time equivalent (FTE) jobs from current employment-generating uses and businesses onsite, which include: A1 shop floorspace, A2 financial and professional floorspace and A3 restaurant and cafe floorspace. This would disproportionately affect people on a low income, of which the baseline indicates there are a higher proportion within the local community area.

12.7.42 Some of these lost jobs could be replaced through employment opportunities generated by the meanwhile use café, retail units and coworking space, though the exact number of potential jobs is not known. The meanwhile use will be operational throughout the construction of the Detailed Area, minimising the amount of time employment opportunities onsite are reduced.

12.7.43 This is expected to result in a low magnitude, medium-term adverse impact on the determinant – it is not likely to have an impact at the scale of the population of the local community. The population sensitivity has been assessed as low based on:

- Medium population vulnerability (high unemployment and income disadvantage); and
- Very low population exposure.

12.7.44 Therefore, this is likely to result in a **minor adverse** health effect, which is not considered significant.

Existence effects

12.7.45 Existence effects have been scoped out of this assessment (see paragraph 12.2.3).

Operational effects

Housing quality and design

12.7.46 Extensive evidence, presented in Appendix I3, shows that high quality, well designed housing and improvements to the quality and design of housing can lead to health benefits.

12.7.47 The Proposed Development has been designed to be accessible and adaptable to meet diverse needs, while increasing access to high quality, well-designed and energy efficient homes.

12.7.48 All new homes will comply with modern space standards, with the majority having private outside space and all having access to communal and public open space. Within the Detailed Area, more than 95% of new homes will have dual aspect living spaces with, 26% of the new homes being suitable for families, including 8% four and five bed properties.

12.7.49 The Proposed Development will meet Building Regulation Requirements M4(2) and M4(3), which relate to designing for accessibility. Ninety per cent of homes

will be classified as 'accessible and adaptable' dwellings, while the remaining 10 per cent will be wheelchair user friendly. Therefore, all dwellings will be considered accessible.

12.7.50 Fifty-one per cent of units will be 'affordable', which includes a mixture of social rent and intermediate rent homes, approximately matching the percentage of socially rented homes within the ward area (50 per cent). Affordable housing will be mixed throughout the development and tenure will be blind: there will be no visible external difference between affordable and private housing, promoting the principles of equality and inclusion.

12.7.51 There will be a mixture of housing types on offer – ranging from one to four-bedroom homes, with the majority of dwellings being one to two-bedroom dwellings. This is deemed to match the current housing need as the average household size in Westminster is 2.0 persons per household and only 19 per cent of dwellings have a dependent child (See Section 15 Socio-economics). Approximately 20 per cent of dwellings will be family sized, falling short of Westminster's 25% target. That said, it should be highlighted that Westminster is experiencing a negative growth trend of children, which would therefore reduce the need for large dwellings.

12.7.52 The mix of affordable housing has been designed to accommodate the needs of the social tenants and resident leaseholders that are to be reprovided with housing within the Proposed Development. This means that social tenants and resident leaseholders will be re-provided with housing that suits the size and needs of their family. This may be beneficial to social tenants, particularly when taking into consideration the relatively high levels of overcrowding in the area.

12.7.53 The proposal is that the Council builds a first phase of 226 new social, intermediate rent and ownership and market sale homes, which will offer re-housing to all secure tenants and resident leaseholders wishing to stay on the site or return if they have already opted to move temporarily off site.

12.7.54 The design of the buildings considers high performance, insulated, airtight facades, with openable windows to provide adequate natural ventilation, should outdoor acoustic and climatic conditions be appropriate. Passive strategies are incorporated to reduce the demand for active heating and cooling. Energy efficient internal lighting has been specified (Ref: EBR-09).

12.7.55 Climate change predictions suggest that London will experience a higher number of hot days, which would require appropriate design measures to be modelled and implemented to ensure ongoing summertime thermal comfort for residents. The design has been modelled against a number of extreme, high emission scenarios, as well as the most likely scenario for the coming decade[88]. Results do not show that excessive heat will be expected within dwellings. Without future climate conditions incorporated into the model, future thermal comfort remains unknown.

12.7.56 In summary, the Proposed Development will provide an increased offer of high quality, affordable and accessible housing that reflects the diverse needs of the community. High energy efficiency will reduce operational costs to residents. As

[88] Based on the CIBSE TM59 methodology, including modelling for DSY1, DSY2 and DSY3. Further details available from: https://www.cibse.org/knowledge/knowledge-items/detail?id=a0q0O00000DVrTdQAL

residents of the local community area show high levels of income and living environment deprivation, it is expected that this Proposed Development will bring positive health benefits.

12.7.57 This is expected to result in a medium magnitude beneficial impact on the determinant – having the potential to improve quality of life over the long term to a considerable amount of people within the local community area but a relatively small population in the context of the wider community area. The population sensitivity has been assessed as high based on:

- High population vulnerability (high living environment and income deprivation); and
- Medium population exposure.

12.7.58 Therefore, this is likely to result in a **major beneficial** health effect, which is considered significant.

Access to healthcare services and other social infrastructure

12.7.59 Evidence shows that that access to public services and social infrastructure such as health, education and community facilities has a direct positive effect on human health. Increased demand on healthcare services in the local and wider area could potentially lead to negative health outcomes (Appendix I3).

12.7.60 The socio-economic assessment (Section 15) assessed the likely additional demand the residents of the Proposed Development would put on local GP practices and educational facilities (including early learning, primary and secondary education) and concluded that it would not have a significant impact on existing services.

12.7.61 The design includes the provision of 158 sqm of community hall space that has been designed to allow for flexible use. In addition, there is a high number of community facilities within the wider community area for residents to use. These are listed in detail in Appendix L and include youth clubs, children's centres and family hubs. It is not anticipated that the net increase in residents would significantly impact the capacity of these community facilities.

12.7.62 There is provision for street-level retail areas, which have been zoned in a way to allow for more community inclined amenities. It is anticipated this will include a gym, nursery and affordable workspaces, though final use will be subject to detailed design.

12.7.63 These factors are expected to result in a low magnitude, long-term beneficial impact on the determinant, with increased demand for GP provision, school places and community facilities being able to be accommodated within existing service provision and provision of new community facilities on site to serve the new community. The population sensitivity has been assessed as low based on:

- Very low population vulnerability (access to services is not expected to exacerbate vulnerabilities); and
- Medium population exposure.

12.7.64 Therefore, this is likely to result in a **minor beneficial** health effect, which is not considered significant.

Access to open space and nature

Open space and nature

12.7.65 Evidence shows that access to open space and nature, including proximity and size, positively influences physical and mental health outcomes. The Proposed Development does not lie within an area of open space deficiency, so receptors are not considered to be sensitive to the effects of this determinant. Details of nearby open space is detailed in paragraph 12.6.21 and this will not change from the baseline description.

12.7.66 Existing open space onsite measures 13,525 sqm (paragraph 12.6.22), though a large portion of this is space is poorly defined and has limited levels of usability to the local community, as well as low biodiversity value.

12.7.67 The quality of open space within the Proposed Development will be improved through thoughtful landscaping and enhanced biodiversity. The space will include four connected public squares with interlinked pedestrian and cycle routes in, through, and out; landscaped entry points from Ebury Bridge Road; a community herb garden; children's play spaces, and playable landscaping distributed throughout the Proposed Development.

12.7.68 Landscaping will consider sightlines, maximise sun in the south facing courtyards and create shaded areas, which will become increasingly important as London is expected to experience more days of extreme heat in the future. All public open space will be wheelchair accessible and movement priority will be given to pedestrians and cyclists. Vehicle access will be possible around a square with access to Ebury Bridge Road but both active and passive measures will be included to ensure vehicles maintain a slow speed.

12.7.69 The Proposed Development will include 9,515 sqm of open space and 308 sqm of private open space. Although the overall quantum of open space per capita will decrease, the addition of private open space as well as the significant improvement in quality, usability and accessibility to residents and the wider community is expected to provide significant benefit.

Play space

12.7.70 The development site is located in an identified area of Play Space Deficiency. There is a higher than the national average of obese children in the Westminster. Based on these factors, receptors are considered to be highly sensitive.

12.7.71 The quality of play space will improve. Play space design has been guided by the Mayor's Supplementary Planning Guidance (SPG) 'Shaping Neighbourhoods: Play and Informal Recreation' (2012), which aims to deliver a range of play experiences to cater to the specific needs of children across a range of ages. A survey of existing play space usage was undertaken to inform the design and range of play space in the Proposed Development. Through this survey, it was recognised that the existing MUGA was underused and as such, the design of the new MUGA will allow for a more flexible use.

12.7.72 Although the quality will increase, the quantum of available play space falls below the requirement. The proposal should provide at least 4,679 sqm of play space for children aged from 0 – 17 years. The proposals provide a total of 2,854 sqm play space provision.

12.7.73 Taking into account the overall deficiency in existing formal children's play provision, the receptors are judged to be of high sensitivity. The new provision represents an increase of 1,018 sqm compared to existing and has been redistributed so there is now a greater focus on play for the younger demographic. The play spaces proposed will be fully overlooked and integrated into the development to encourage maximum use and interaction. Therefore, in design terms, they are considered to be an improvement on the existing provision. However, the proposed quantum of play space still represents a shortfall of 39% compared to the requirement for 4,679 sqm.

Assessment

12.7.74 This is expected to result in a medium magnitude, long-term adverse impact on the determinant – it is likely to be noticed as a change by the local population, particularly by children and their parents. The population sensitivity has been assessed as low based on:

- Medium population vulnerability (overall average health outcomes for the adult population and good access to nature, high obesity rates with reduced access to child friendly open space); and
- Low population exposure.

12.7.75 Therefore, this is likely to result in a **minor adverse** health effect, which is not considered significant.

Air quality, noise and neighbourhood amenity

12.7.76 Neighbourhood amenity refers to the quality of physical external space, both private and public. The operation of the Proposed Development will impact on neighbourhood amenity for residents within the local community area through changes to noise, air emissions and visual amenity.

12.7.77 Evidence shows that increased environmental noise has the potential to cause psychological disturbance (rather than physiological) which in turn could impact on wellbeing Appendix I3). The noise effect on residential receptors in the local area was modelled as part of the noise and vibration assessment (Section 14) and concluded that operational noise from the Proposed Development will be not significant for:

- Noise arising from the fixed plant;
- Noise arising from delivery vehicles; and
- Operational noise in general.

12.7.78 However, it has been identified that passive ventilation (i.e. trickle vents and open windows) would expose occupants to unacceptable levels of indoor noise, particularly at night. Consequently, to meet planning policy and comply with Building Regulations in terms of both noise and overheating limits, each

apartment will incorporate mechanical ventilation with comfort cooling. This means that to combat overheating during hotter periods, occupants will not need to rely solely on opening windows to provide cooling.

12.7.79 The negative correlation between air pollution and health outcomes is well researched (Appendix I3). The pollutants of key concern are particulate matter ($PM_{2.5}$ and PM_{10}) and nitrogen dioxide (NO_2). The air quality assessment (Section 5) concludes that there will be no exceedances of annual mean PM_{10} or $PM_{2.5}$ levels and no new exceedances of NO_2 for future residents or sensitive receptors. Some exceedances of annual mean NO_2 levels are predicted along Ebury Bridge Road. Due to conservative modelling, a significant impact is not expected. It is therefore not expected that air pollution arising from this development will negatively impact the health of residents and indeed, with the implementation of the Ultra-Low Emission Zone (ULEZ), air quality is expected to continue to improve.

12.7.80 Within the estate itself, the 'car-lite'[89] design is expected to offer improvements to noise and air quality levels.

12.7.81 The Proposed Development is likely to contribute to enhanced environmental and social amenity, improving the general quality of life for residents through improved design in public spaces that allows for better quality access to nature due to enhanced onsite biodiversity, improved accessibility for all, and reduced crime. Refer to paragraphs 12.7.65, 12.7.93 and 12.7.117.

12.7.82 The design of public open spaces will consider the needs of pedestrians with visual impairment. This will include hazard warning paving, contrast colour kerbs, textured surfaces and considered placement of street furniture and signage.

12.7.83 Climate change considerations have been made through the use of shading in the planting strategy and through the incorporation of a drinking fountain at the Community Hub Square. These factors will become increasingly important as London experiences more days of hot weather.

12.7.84 This is expected to result in a very low magnitude long-term beneficial impact on the determinant – having been assessed as not significant by relevant topics. The population sensitivity has been assessed as medium based on:

- Medium population vulnerability (an average or close to average proportion of vulnerable or disadvantaged groups); and
- Medium population exposure.

12.7.85 Therefore, this is likely to result in a **minor beneficial** health effect, which is considered not significant.

Accessibility and active travel

12.7.86 As discussed in paragraph 12.7.26, evidence shows that accessibility for local residents to community facilities, public services and employment has a direct positive effect on human health (refer to Appendix I3 for evidence).

12.7.87 This site is in an area with a PTAL rating of 6b, which is the highest possible and indicates an excellent public transport network. No change to this connectivity is

expected at the time of the future baseline (2028) and the increase in population is not expected to materially affect the service. Therefore, there are no expected changes to the determinant or associated health outcomes.

12.7.88 Accessibility for local residents to community facilities can play a significant role in promoting or discouraging physical activity and research suggests that most sustained exercise is taken during the course of everyday activities such as travelling to work or going to the shops, rather than specifically for health purposes (refer to Appendix I3 for evidence).

12.7.89 The Proposed Development will improve accessibility for people with a disability. The public realm will be level and fully wheelchair accessible. There will be 42 disabled car parking spaces, a significant net improvement on the seven onsite at present.

12.7.90 The design of the Proposed Development will also encourage active travel for pedestrians and cyclists through:

- the creation of a 'car-lite development'[89], which would decrease private vehicle need and therefore use (parking provision is for people with a disability only, one car club bay and any other access is for service and delivery vehicles only);
- the separation of pedestrians, cyclists and vehicles through the onsite pathway network; and
- the provision of secure cycle parking in line with the requirements of the Intend to Publish London Plan (2019), as well as a cycle hire docking station on the southern site boundary.

12.7.91 This is expected to result in a medium magnitude impact on the determinant – with improved accessibility and increased emphasis on active travel options such as cycling having the potential to improve health and wellbeing to the residents of the Proposed Development in the long-term. The population sensitivity has been assessed as low based on:

- Low population vulnerability (overall population health is comparable to London); and
- Medium population exposure (estate level).

12.7.92 Therefore, this is likely to result in a **minor beneficial** health effect, which is not significant.

Crime reduction and community safety

12.7.93 Evidence shows that community safety is crucial in determining direct and indirect health and wellbeing outcomes (refer to Appendix I3 for evidence).

12.7.94 There is an existing problem of crime and antisocial behaviour within the ward area. To reduce the potential for crime, the design will seek silver certification

[89] Defined as a housing development that is designed to deter reliance on cars and encourage walking, cycling and public transport use. For more detail, refer to the Mayor of London's Transport Strategy, 2018. Available from: https://www.london.gov.uk/sites/default/files/mayors-transport-strategy-2018.pdf

against the Secured by Design for Homes 2019 framework, in close liaison with the Designing Out Crime Officer at the Metropolitan Police Service.

12.7.95 Design features will aim to address the potential threats identified in the local area, including unauthorised entry into residential dwellings, violence and anti-social behaviour.

12.7.96 The following key security considerations form part of the silver certification:

- Public realm and community areas designed to maximise natural surveillance, including active street frontages, open and visible footpaths, minimal access routes to and around the area. Active surveillance features such as CCTV and access-controlled systems are included to further reduce the potential for crime;
- The use of strategic planting and graffiti-resistant materials to deter anti-social behaviour;
- Outdoor lighting that facilitates facial illumination and avoids dark corners to reduce the fear of crime; and
- clear identification of routes and segregation of vehicles and pedestrians.

12.7.97 Reducing crime and improving community safety can lead to an increased sense of safety and well-being amongst local residents. Passive design features reduce the need for technological surveillance equipment, contributing to sense of a safer local area.

12.7.98 This is expected to result in a medium magnitude long-term beneficial impact on the determinant – it is likely to have an impact at the scale of the Proposed Development, but the impact felt at the local community scale is likely to be minimal. The population sensitivity has been assessed as medium based on:

- High population vulnerability (high levels of crime); and
- Low population exposure.

12.7.99 Therefore, this is likely to result in a **moderate beneficial** health effect, which is considered significant.

Access to healthy food

12.7.100 Evidence shows that the availability of healthy eating food outlets which sell high quality, nutritious food at affordable prices is an important factor influencing food choices. Access to healthy food and a nutritious diet can prevent health effects and chronic diseases related to obesity. Poor diet and nutrition, together with smoking and alcohol accounted for many coronary heart disease and cancer deaths (refer to Appendix I3 for evidence).

12.7.101 Residents will have access to fresh and healthy food that is within walking distance, though access is limited.

12.7.102 There is an existing Sainsbury's Local store located just outside of the site boundary. Pimlico Farmer's Market is within walking distance to the Proposed Development, offering fresh food on Saturday mornings. No fast food retailers are included in plans for the Proposed Development.

12.7.103 An existing pop-up fresh food retailer on Ebury Bridge Road will be relocated to a retail area in Block 1, contributing to access to healthy food.

12.7.104 During consultation, the community raised concerns that the current Sainsbury's Local store has insufficient capacity. With a net increase in residents, this may result in reduced accessibility to fresh and healthy food items.

12.7.105 A community herb garden will be provided on the first-floor podium terraces. However, given its limitation as a small herb garden, is not expected to change access to healthy food.

12.7.106 This is expected to result in a low magnitude, long-term adverse impact on the determinant – access to healthy food may be slightly decreased due to the net increase in population on the estate. The population sensitivity has been assessed as low based on:

- Low population vulnerability (better than average health outcomes in adults but higher proportion of overweight children); and
- Medium population exposure.

12.7.107 Therefore, this is likely to result in a **minor adverse** health effect, which is not considered significant.

Access to work and training

12.7.108 Evidence shows that there is a strong positive correlation between good employment and income levels, and health – providing psychological benefits, improving life expectancy and enabling healthier lifestyle choices (refer to Appendix I3 for evidence).

12.7.109 The Proposed Development is likely to support 96-108 net FTE jobs, of which 32-36 would be indirect or induced (refer to Appendix L).

12.7.110 Based on the current floorspace schedule, it is likely that jobs within the Proposed Development will relate to food and drink (class A3), drinking establishments (class A4), business space (class B1), leisure (class D2) and non-residential institutions (class D1 - for example, a nursery). Refer to Appendix L for detail.

12.7.111 The council is anticipating that a gym, privately run nursery, and affordable business space, that is suitable for small businesses, will be included within the floorspace, though final use will be subject to detailed design.

12.7.112 Depending on the actual nature of the work, increased access to employment opportunities can result in health and well-being benefits associated with secure employment and increased income levels, particularly beneficial for the residents of the ward area, many of whom are currently employed by the retail sector. Although the Proposed Development results in a significant net increase in FTE jobs relative to the baseline, this increase is not expected to have a noticeable effect at a population level.

12.7.113 Longstanding businesses on Ebury Bridge Road will be offered the right to first refusal and as part of this may be required to prioritise local employment by way of acceptance criteria (as described in paragraph 12.7.8). Businesses will be

required to temporarily move away for the construction period, before retail units are reinstated in 2025.

12.7.114 No training provision is anticipated on site at this stage, though this is not considered to be an area of concern as residents within the local community have good access to training facilities across London.

12.7.115 This is expected to result in a low magnitude, long-term beneficial impact on the determinant – it is not likely to have an impact at the scale of the population of the local community. The population sensitivity has been assessed as low based on:

- Medium population vulnerability (high unemployment and income disadvantage but good access to training); and
- Very low population exposure.

12.7.116 Therefore, this is likely to result in a **minor beneficial** effect, which is not considered significant.

Social cohesion and inclusive design

12.7.117 Social cohesion is defined as the quality of social relationships and existence of trust, mutual obligations and respect in communities or the wider society and is linked to levels of inequality or exclusion within a given community. Evidence shows that the physical environment can directly influence social cohesion (refer to Appendix I3 for evidence). Within this Proposed Development social cohesion and inclusive design are facilitated by the considered design of homes, public realm and governance structures, as described below.

Homes

12.7.118 Homes and the public realm within the Proposed Development are designed to encourage and promote social cohesion, accessibility and inclusive design within the Proposed Development itself and within the wider local community area. These measures are outlined below and are particularly important to continue to support the diverse local community area.

12.7.119 The Proposed Development has been designed to incorporate high-quality buildings and public realm that respond sensitively to the existing surrounding local community area. The form, massing, height, layout and external appearance of the buildings are intended to complement the local character. This will assist with general integration into the local community area.

12.7.120 The new homes within the Proposed Development will adopt the Lifetime Homes principles of inclusivity and accessibility to create homes that can be used by everyone regardless of age, gender or disability.

12.7.121 As described in paragraph 12.7.50, affordable housing will be mixed throughout the development and tenure will be blind: there will be no visible external difference between affordable and private housing, promoting the principles of equality and inclusion. This will allow all residents in the building to have access to the same services and standard of living, both at home and in the public realm.

Public realm

12.7.122 The public realm has been designed to encourage social interaction and is designed to be 100 per cent wheelchair accessible. Footpaths are open to the public and various lighting and wayfinding techniques have been incorporated into the design to ensure that the public realm feels safe and accessible. There are no physical barriers that would discourage entry. The design has considered sight lines to ensure visibility throughout the development.

12.7.123 The design includes the provision of 158 sqm of community hall space that has been designed to allow for flexible use. This goes beyond recognised best practice measures, which states that one community centre should be provided for every 7,000 – 10,000 people, as it is expected that this Proposed Development would generate 1,784 residents. If used as intended, it will allow for social bonds and cohesion to be strengthened across the diverse residents of the Proposed Development. While it is expected this will have an impact on the residents of the Proposed Development, given the extensive community facilities already present in the wider community area (see paragraph 12.6.41 and Appendix L), it is not expected that this will impact the population outside of this.

Governance

12.7.124 A Community Futures Group has been established to work with the Council to enter into meaningful dialogue about the overall goals of the project, including the use of the community hall space. The Group has and will have representatives of all current, future and decanted tenants, leaseholders and onsite businesses, which allows for fair, inclusive and democratic decision-making at the Proposed Development. Terms of Reference have been established to govern this group.

12.7.125 These factors are expected to result in a medium magnitude, long-term beneficial impact on the determinant – it is likely to be perceived as a modest change by a small population. The population sensitivity has been assessed as medium based on:

- Medium population vulnerability (high levels of diversity compared to the national average); and
- Medium population exposure (exposure relates predominantly to future residents of the Proposed Development, and some effects felt by members of the local community area).

12.7.126 Therefore, this is likely to result in a **moderate beneficial** health effect, which is considered significant.

12.8 Mitigation and recommendations

12.8.1 The health assessment takes into account mitigation measures considered within other assessments including air quality (Section 5), noise and vibration (Section 14) and socio-economics (Section 15). One significant adverse effect has been identified as part of this assessment with respect to the 'air quality, noise and neighbourhood amenity' health determinant. The significance is caused by a significant effect identified as part of the noise and vibration assessment (Section

14). Therefore, the relevant mitigation measures in the noise and vibration assessment should be referred to.

12.8.2 The following recommendations are proposed to improve health outcomes during construction and operation phases of the Proposed Development. Although these may not have arisen as a result of an effect assessed as significant adverse, the implementation of these recommendations may contribute to an improvement in health outcomes:

- Additional shade and shelter should be designed along pedestrian/accessible wheelchair/cycling routes and near disabled car parking spaces, secure cycle parking, and cycle hire docking station where practical. This will provide comfort and resilience to pedestrians, cyclists and people with disabilities to extreme weather events and climate change impacts.
- Community areas, including associated street furniture and signage, should consider the needs of people with dementia, based on the principles of Dementia Friendly Communities. This includes the consideration of a range of factors such as ensuring that signs are at eye-level and well lit, glass doors clearly marked and appropriate lighting provided.
- Commit to the additional practical measures to promote active travel proposed as part of the draft Travel Plan (Ref: EBR-08).
- A formal employment training and skills strategy should be developed in collaboration with the Community Futures Group to ensure that residents within the local community area and wider community area have good chances of securing operation related employment at Proposed Development, particularly as food services and retail sectors are key employment sectors for Westminster residents (Refer to Appendix L for details).

12.9 Residual effects

Construction effects

12.9.1 One significant adverse effect was identified for the construction phase and this will be mitigated as part of the noise and vibration assessment (Section 14).

Existence effects

12.9.2 No significant adverse effects were identified for the existence phase and therefore no further mitigation is required.

Operational effects

12.9.3 No significant adverse effects were identified for the operational phase and therefore no further mitigation is required.

12.10 Cumulative effects

12.10.1 The list of developments identified for assessing cumulative effects is presented as Appendix A5. In Table 35 the potential for cumulative effects with each of these developments is examined. Two **significant beneficial cumulative effects**

have been identified under the health determinant of 'Housing quality and design' during operation.

Table 35: Health cumulative effects

Development	Potential for significant cumulative effects	Comments
Battersea Power Station, Kirtling Street	No	Battersea Power station site is sufficiently far away from the Proposed Development, and in a different London Borough, limiting the potential for significant cumulative effects.
Chelsea Barracks, Chelsea Bridge Road	Yes, potentially, but no significant cumulative health effects identified.	Chelsea Barracks site is sufficiently close to the Proposed Development, and in the same London Borough, meaning that there is potential for cumulative health effects. However, there as there is no health assessment within the Chelsea Barracks ES or as a standalone assessment, assessing the potential for significant health effects is not straightforward. The noise and vibration assessment for the Proposed Development identifies the potential for concurrent construction works to cumulatively affect the receptors between the Proposed Development and Chelsea Barracks, with any effects being temporary in nature. This could result in a significant cumulative effect as part of the 'air quality, noise and neighbourhood amenity' determinant, which is already considered significant. Therefore, this would not change the conclusion. In isolation (i.e. no other significant cumulative effects have been identified by other topics during construction), this does not represent a significant cumulative health effect. The socio-economic assessment (Section 15) for the Proposed Development identifies potential for a significant cumulative beneficial effect on housing arising from Chelsea Barracks and the Proposed Development due to the overall quantum of housing to be delivered across the two sites. The ES for Chelsea Barracks states that the development would bring forward a total of between 374 and 448 residential units of which 63 units (in both scenarios) would be affordable tenures (of which 35 for social rent and 28 for intermediate rent). A further 60 units (in both scenarios) would be extra care units specifically for use by older members of the community (of which 52 for social rent and 8 for intermediate rent). This is likely to result in **a significant beneficial cumulative health effect** relating to the health determinant of 'Housing quality and design' for the population in the local, wider and borough areas. This would be particularly beneficial for members of vulnerable groups, including social rented tenants and older people.
Cringle Dock Waste Transfer Station, Cringle Street	No	Cringle Dock Waste Transfer Station site is sufficiently far away from the Proposed Development, and in a different London Borough, limiting the potential for cumulative health effects.
Thames Tideway Tunnel (TTT),	No	The above ground site at Chelsea Embankment Foreshore is the closest TTT site to the Proposed Development and in the same London Borough. The above ground site at Kirtling Street is

Development	Potential for significant cumulative effects	Comments
one above ground site at Chelsea Embankment Foreshore one above ground site at Kirtling Street.		across the river from the Proposed Development and in a different London Borough. Both TTT sites are sufficiently far away from the Proposed Development, limiting the potential for cumulative health effects.

12.11 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Residents (early occupants)	Low magnitude beneficial impact on access to open space and nature with increase on per capita basis.	Negligible health effects.	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
Residents (early occupants) Local residents	Adverse, medium-term impacts on air quality, noise and neighbourhood amenity as a result of construction activities and traffic.	Moderate adverse health effect arising from temporary reduction of quality of life and associated potential mental health effects.	Significant adverse	Significant adverse impact is mitigated through mitigation proposed as part of the noise assessment. See Section 15 of this ES.	Effect unchanged	Not significant
Residents (early occupants) Local residents	Adverse short-term impact on accessibility and active travel from temporary loss of disabled parking spaces.	Minor adverse health effect arising from a potential perceived reduction in road safety and the removal of parking spaces affecting accessibility.	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
Residents (early occupants)	Low magnitude, medium-term adverse impacts on crime and community safety resulting from presence of construction site.	Minor adverse effects on mental health arising from potential perceived reduction of community safety.	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
On-site employees	Adverse, medium-term impact resulting from loss of 39 FTE jobs from current onsite employment-generating uses and businesses.	Minor adverse health effect arising from potential loss of employment.	Not significant	No significant adverse effects, therefore	Effect unchanged	Not significant

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
				mitigation not required.		
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Existence effects have been scoped out of this assessment.						
Use/operation – effects arising from the use / operation of the development						
Residents (new and relocated)	Beneficial long-term impact on housing quality and design. -more accessible -housing mix to meet need -high energy performance	Major beneficial health effect arising from the improvement to housing quality and its potential to improve quality of life.	Significant beneficial	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Significant
Residents (new and relocated)	Beneficial long-term impact on access to healthcare services and other social infrastructure arising from new on-site community facilities.	Minor beneficial health effect arising from new facilities	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
Residents (new and relocated)	Adverse long-term impact on access to open space and nature arising from decrease in quantum of available onsite public space, particularly play space for children.	Minor adverse effect on mental and physical health	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
Residents (new and relocated)	Beneficial long-term impact on air quality, noise and neighbourhood amenity arising from car-lite development and improved design of public spaces.	Minor beneficial health effect arising from enhanced neighbourhood amenity, potentially contributing to an improved quality of life.	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
Residents (new and relocated)	Beneficial long-term impact on accessibility and active travel arising from improved site accessibility for people with a disability and increased	Minor beneficial health effect arising from improved site accessibility and active transport opportunities.	Not significant	No significant adverse effects, therefore	Effect unchanged	Not significant

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
	emphasis on active travel in design of Proposed Development.			mitigation not required.		
Residents (new and relocated) Local community	Beneficial long-term impact on crime and community safety arising from improved design of Proposed Development, which incorporates passive design features to improve safety.	Moderate beneficial health effect arising from improved crime and community safety measures.	Significant beneficial	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Significant
Residents (new and relocated)	Low magnitude adverse long-term impact on access to healthy food arising from net increase in number of residents without additional provision / expansion of local grocery store.	Minor adverse health effect arising from increased pressure on existing fresh food facilities.	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
Residents (new and relocated) On-site employees	Beneficial long-term impact on access to work and training arising from net increase of 96-108 FTE jobs.	Minor beneficial health effect arising from net increase in available local jobs.	Not significant	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Not significant
Residents (new and relocated)	Beneficial long-term impact on social cohesion and inclusive design arising from improved community facilities, as well as improved design of homes and public spaces to cater for a diverse range of needs.	Moderate beneficial health effect arising from improved private and public realm.	Significant beneficial	No significant adverse effects, therefore mitigation not required.	Effect unchanged	Significant

13 Land quality

13.1 Introduction

13.1.1 This section describes the likely significant effects of the Proposed Development on land quality. The potential significant effects upon the Proposed Development related to ground contamination at the site are also assessed. It describes the methodology, the baseline conditions and the likely effects associated with the construction, existence and operation of the Proposed Development. Mitigation measures which would be implemented to reduce the effects of the Proposed Development on land quality are also described, where relevant.

13.2 Scope of the assessment

13.2.1 The scope of the assessment of land quality is summarised in Table 36.

Table 36: Land quality assessment scope

Assessment	Construction	Existence	Operation
Human health	✓	×	✓
Controlled waters (surface water and groundwater)	✓	n/a	✓
Building materials and services	✓	✓	×
Sensitive ecological receptors	×	✓	×

13.2.2 A Scoping Opinion was received from Westminster City Council on 6 December 2019. This included one comment relating to land quality. The response to this comment is detailed in Appendix A3. In summary, the scoping opinion did not change the scope of the assessment.

13.2.3 Adverse environmental effects on geological resources arising from the Proposed Development encompass loss of mineral resources or agricultural soils or damage to geological features of significance. However, there are no such geological resources or agricultural soils on or near the site, so these are not assessed.

13.2.4 Potential adverse environmental effects associated with ground contamination principally concern:

- pollution of groundwater;
- pollution of surface waters;
- human health and safety onsite and offsite;
- ground conditions aggressive to construction material; and
- harm to designated ecological habitat (from contamination) and plant growth restriction.

13.3 Consultation

13.3.1 A request for environmental information, pertinent to the developmental history and potential for ground contamination at the site, was made to Westminster City Council (WCC) and the Environmental Agency. Information from WCC Council is presented in their letter report (ref. 19/19221/EE1CL), dated May 2019 (Appendix J2), comprising historical maps of the site. Additional information was received from the Environment Agency in January 2020 (Appendix J3), comprising records of pollution incidents, historical landfills and permits within the vicinity of the site. All information received is considered in the baseline assessment.

13.4 Methodology

Overview

13.4.1 This section outlines the methodology for assessing the likely significant effects related to ground conditions and land contamination during the construction, existence and operation stages of the Proposed Development.

13.4.2 The assessment assumes the Proposed Development will comply with legislative requirements including: The Construction (Design and Management) Regulations, 2015 (the 'CDM Regulations'); The Control of Asbestos Regulations (CAR) 2012[90] and CAR-SOIL[91] where asbestos is encountered; and Waste management regulations[92,93].

13.4.3 The assessment has been undertaken in accordance with various national guidance and standards including latest land contamination: risk management[94] guidance from the Environment Agency. This provides the technical framework for applying a risk management process when dealing with land affected by contamination.

13.4.4 The assessment has considered the extent, method, and programme of the proposed groundworks, foundations and infrastructure that will be required.

13.4.5 The assessment of likely significant effects has used a seven-level scale of significance as detailed in Appendix J1 Table J1.1. These consider water resources and the human, ecological and property receptors. The significance criteria take account of both the magnitude of the effect (Appendix J1 Table J1.2), which is a function of its severity and likelihood (Appendix J1 Table J1.3), and the sensitivity of the receptors (Appendix J1 Table J1.4).

13.4.6 Receptors sensitive to changes in ground conditions and contamination have been grouped based on their key characteristics. The sensitivity of the receptor is based

[90] Control of Asbestos Regulations 2020 (SI 2012/632).
[91] CAR-SOIL (CL:AIRE & JIWG) (2016), Control of Asbestos Regulations 2010, Interpretation for managing and working with asbestos in soil and construction and demolition materials, industry guidance.
[92] Waste (England and Wales) Regulations SI 2011/988
[93] Environment Agency (2018) Technical Guidance WM3: Guidance on the classification and assessment of waste
[94] gov.uk/guidance/land-contamination-how-to-manage-the-risks

on the relative importance of the receptor using the scale set out in (Appendix J1 Table J1.4)

Baseline methodology

13.4.7 Arup has prepared a ground contamination desk study and preliminary risk assessment (PRA) report for the site, included in Appendix J2, hereafter referred to as the PRA.

13.4.8 The PRA summarises known contamination conditions at the site, describes the likely site investigation scheme (SIS) and includes information on verification reporting following any remediation or development works.

13.4.9 The baseline assessment comprises a desk study of existing ground conditions information based on historical land uses and available ground investigation. The assessment completed is risk-based and considers potential sources, sensitive receptors and potential plausible contaminant linkages in accordance with government guidance and the UK framework for the assessments of risks arising from contaminated land.

13.4.10 The baseline assessment considers the following information sources that are also summarised in detail in the Arup (2019) PRA:

- a site reconnaissance survey;
- a Groundsure commercial environmental data search report;
- an environmental search report provided by WCC;
- online resources such as the BGS and MAGIC websites;
- limited previous investigation and assessment on a small part of the site undertaken by White Young Green (WYG): WYG (2018) Edgson House Demolition, Geo-Environmental Assessment Report (Ref. A0111383); and,
- various other internet sources described in the PRA.

Construction effects

13.4.11 Construction effects have been assessed based upon the known or potential ground conditions revealed by the baseline information and the proposed extent and anticipated method of ground works and construction. These criteria have been derived by taking account of the guidance provided in the Construction Industry Research and Information Association (CIRIA) report regarding good risk assessment practice (C552)[95].

Existence effects

13.4.12 The assessment of existence effects considers how the development would alter ground conditions and properties through its presence on the site including long-term risks to groundwater, surface water and building materials.

[95] CIRIA C552 (2001) Contaminated Land Risk Assessment, A guide to good practice

Operational effects

13.4.13 Operational effects consider the effects on future site users (humans) and how they interact with the Proposed Development.

Cumulative effects

13.4.14 It has been assumed that all the identified developments for the cumulative assessment would require assessment and remediation to ensure minimal or no risk to receptors from ground conditions and contamination during construction and operation. This would be assured by the national planning policy, planning conditions, building regulations, safety and environmental permitting regulations.

13.4.15 Appropriate good practice measures undertaken during the demolition and construction phases such as dust control and pollution prevention controls would also ensure that the developments would not result in additional contamination of the ground or groundwater, or additional human health effects. Therefore, there would be no significant cumulative effects with other developments with respect to ground and groundwater contamination and conditions.

13.5 Baseline

13.5.1 The baseline information is presented in the ground contamination PRA (Appendix J2). A summary of the baseline information is provided below to inform the contamination status of the site and subsequent assessment of likely significant effects.

Current land use

13.5.2 The site is currently occupied by residential buildings built between 1929 and 1955 that vary between five and nine storeys. Two buildings in the west of the site (Rye House and Bucknill) each have a single storey basement, the remaining buildings have no basement. The buildings are either occupied by residents or have been vacated. The former Edgson House (in the south-west of the site) was demolished in 2019 and is currently subject to development for a meanwhile use.

13.5.3 An environmental reconnaissance survey of the site was carried out in April 2019. There is a small commercial dry-cleaning business occupying one unit on the ground and basement floor in Bucknill House. Two electricity substations are in the east of the site. Small plant rooms are external to Victoria House and Westbourne House. No tanks, chemical or fuel storage were observed. A plan of the site configuration is shown in the PRA (Appendix J2) In addition to the buildings, the site comprises access roads, parking spaces, lock-up style garages, soft landscaping, recreational grounds and a park.

13.5.4 The surrounding area comprises a combination of residential and commercial uses to the north, west and south. The site is bounded in the east by Network Rail land. A large electricity substation is located approximately 20m to the north of the site. A former fuel filling station is located approximately 15m to the west of the site, operational between 1955 and 2003, which is now used as a car wash. Based on observations it is likely that the underground tanks and infrastructure remain *in situ*.

Site history

13.5.5 The site has varied historical uses, predominantly commercial and industrial from the 1820s up until the 1920s. The Grosvenor Canal was in the east of the site (partially backfilled in 1929) with factories and mills in the west. Wolseley motor works occupied the southern part of the site from 1916 to 1949 and a corporation yard from 1949 to 1957. The Ebury Bridge Estate (residential use) was built in three stages from 1929 to 1955.

13.5.6 A review of historical maps is presented in the PRA. Potentially contaminative land uses within 250m of the site comprise a filling station (1957 to 2003), railway lines/sidings (from 1879), a sheet metal engineering works (1949 to 1991) replaced by an electrical substation (1991 to current) and Chelsea Barracks (1866 to 2008) and associated fuel storage.

Geological setting

13.5.7 The ground conditions are anticipated to comprise a variable thickness of Made Ground, from historical development and demolition, over superficial deposits. Deeper Made Ground is anticipated with the backfill of the former Grosvenor Canal, the thickness and composition of the fill is currently unknown.

13.5.8 The site is expected to be underlain by Alluvium over River Terrace Deposits (RTD). The superficial deposits are expected to be in the order of 10m thick in the area and are underlain by the London Clay which is greater than 35m thick in the area, the Lambeth Group, the Thanet Formation and the White Chalk in sequence.

Hydrogeological and hydrological setting

13.5.9 The RTD is classified by the Environment Agency as a secondary A aquifer (upper aquifer). The RTD is underlain by a substantial thickness of London Clay (unproductive strata). The Lambeth Group and Thanet Formations are classified as secondary A aquifers and the underlying Chalk forms a principal aquifer. The granular strata of the lower Lambeth Group and Thanet Formations are in hydraulic connectivity with the Chalk and together is referred to as the basal sands and Chalk (lower aquifer). The upper and lower aquifers are hydraulically separated by the London Clay aquiclude.

13.5.10 Groundwater in the upper aquifer is expected to flow in a southerly direction towards the River Thames (approximately 300m south of the site). The nearest surface water to the site is the Grosvenor Canal, approximately 100m south. The site is not located within a groundwater source protection zone (SPZ).

Soil and groundwater quality

13.5.11 Previous site investigation was limited to Edgson House. Levels of chemical determinands in the shallow soils were generally low, although lead was detected at concentrations above risk-based criteria considering residential use. Asbestos was also detected at low concentrations in some samples.

Conceptual site model (CSM)

13.5.12 Potential sources of contamination have been identified based on current and historical uses of the site and surrounding area. These are detailed in Table 37.

Table 37 Potential sources of contamination

Source	Potential contaminants of Concern	Significance
Onsite		
Saw mills, tanks and coal, paint and timber stores (1872-1916)	Metals and metalloids, various types of hydrocarbons and volatile organic compounds (VOC), asbestos.	**Moderate:** Potential for leaks and spills from fuel/oil storage. Asbestos may be present in the Made Ground from historical uncontrolled demolition of structures.
Grosvenor Canal infill (1929)	Metals and metalloids, sulphates, total petroleum hydrocarbons (TPH) and polyaromatic hydrocarbons (PAH), asbestos. Ground gases and vapours.	**Moderate:** The canal was filled around 1929 with unknown material (Made Ground), which could include wastes from contemporary local industries and demolition wastes from historical surrounding buildings.
Motor car works, and cooperation depot (mapped 1916-1958)	Metals and metalloids, hydrocarbons, asbestos and VOC (solvents and degreasers).	**Moderate:** The area may have been used for servicing vehicles, including fuel and oil storage. Asbestos may be present in Made Ground from uncontrolled demolition of structures and from brake pads.
Existing dry cleaner's shop along Ebury Bridge road	VOCs and semi-volatile organic compounds (SVOC), specifically chlorinated solvents.	**Low to moderate:** The main cause of ground contamination from dry cleaning is generally from spills and uncontrolled disposal to drains.
Electricity substations (two within site boundary)	Polychlorinated biphenyls (PCB), transformer oils and lubricating oils.	**Very low:** Due to the age of these substations, there is potential for contamination to have leaked into the ground.
Alluvium	Ground gas.	**Very low:** Alluvium soils are a potential source of methane due to naturally occurring organic matter. Gas in peat is 'historically generated' and is generally trapped so that the actual emission rate will be low. The risk from lateral migration is negligible.
Offsite		
Fuel station (15m west, closed)	Petroleum hydrocarbons, solvents, vapours.	**Moderate:** Leaks and spills of fuel from filling and tanks may have affected local groundwater quality in the upper aquifer. Hydrocarbons are a potential source of ground vapours.
Offsite historical industrial land uses including railway lines/sidings	Metals and metalloids, asbestos, hydrocarbons.	**Low:** The railway sidings and associated activities may have affected local groundwater quality in the upper aquifer.

Receptors

13.5.13 Receptors relating to the construction, existence and operation of the Proposed Development are described in full in the PRA in Appendix J2. In summary the receptors include:

- groundworkers and site visitors during construction;
- adjacent onsite residents and neighbours during construction, including occupiers of the detailed part of the development and users of the meanwhile uses whilst the remainder of the site is being built out;
- site residents, workers and visitors during operation;
- maintenance workers during operation;
- River Terrace Deposits (RTD) secondary A (upper) aquifer;
- Chalk principal (lower) aquifer;
- surface waters including Grosvenor Canal and the River Thames;
- onsite buildings, materials and services; and
- ecological receptors including new and existing soft landscaping.

Pathways

13.5.14 Human health receptors may be exposed to soil and groundwater contamination via dermal contact, ingestion and inhalation. Water receptors may be impacted by leaching and migration of soil contaminants. A list of pathways is given below:

- dermal contact, ingestion and inhalation of soil and soil derived dust onsite during construction and operation;
- migration of hazardous gases and vapours into confined spaces and subsequent inhalation;
- plant uptake from soil and subsequent human consumption of home-grown produce;
- vertical and lateral migration of free phase product (such as petroleum hydrocarbons);
- leaching of contaminants from soils;
- vertical and lateral migration of dissolved phase contamination;
- creation of preferential pathways during construction; and
- direct contact with construction materials and services.

Potential plausible contaminant linkages (PCL)

13.5.15 The PCLs linking receptors and sources are described in Table 38. Inactive pathways have been excluded. The classification of likelihood, consequence and risk are based on the method presented in CIRIA 552[96]. The classification tables used in this assessment are included in Section J1.3 of Appendix J1.

[96] CIRIA (2001), Contaminated land risk assessment - A guide to good working practice (C552).

Table 38 Plausible potential contaminant linkages

Ref	Linkage	Likelihood	Consequence	Risk estimation (without mitigation)
Risk to human health during construction				
PCL1	Exposure of ground workers and site visitors during construction to contaminated soil, vapours, gases, contaminated dust and contaminated groundwater or non-aqueous phase liquid (NAPL) via dermal contact, ingestion or inhalation.	Likely	Medium	Moderate
PCL2	Exposure of site neighbours (including occupiers of the detailed part of the development and users of the meanwhile uses) during construction to contaminated dust via inhalation.	Low likelihood	Medium	Low to moderate
Risk to human health during operation				
PCL3a	Exposure of future site users (residents, workers and site visitors) to contaminated soil, contaminated dust and contaminated groundwater or NAPL via dermal contact, ingestion or inhalation of dust.	Likely	Medium	Moderate
PCL3b	Exposure of future site users (residents, workers and site visitors) to vapours and gases via migration and inhalation of ground gases or vapours.	Likely	Medium	Moderate
PCL3c	Exposure of future site users (residents, workers and site visitors) to contaminated soil, contaminated dust and contaminated groundwater or NAPL via consumption of home grown produce.	Unlikely	Medium	Low
PCL4	Exposure of maintenance workers during operation to residual contamination in shallow soils (Made Ground) via dermal contact, ingestion and inhalation of dust.	Unlikely	Medium	Low
Risk of pollution to controlled waters				
PCL5	Potential pollution of the RTD Secondary A aquifer during construction and operation via migration of free phase contamination, leaching of contaminants or migration of dissolved phase contamination.	Likely	Medium	Moderate
PCL6	Potential pollution of surface waters during operation and operation from residual contamination in the RTD aquifer via migration of free phase contamination or migration of dissolved phase contamination.	Unlikely	Mild	Very low

Ref	Linkage	Likelihood	Consequence	Risk estimation (without mitigation)
Risk to building materials and services				
PCL7	Exposure of onsite buildings, materials and services to residual contamination in the RTD aquifer via direct contact.	Likely	Mild	Moderate to low
Risk to ecological receptors				
PCL8	Exposure of new plants to residual contaminated soils via root uptake.	Unlikely	Mild	Very low

Future baseline

13.5.16 In the absence of this redevelopment project, the site is likely to remain urban and residential. Due to its central location, there is likely to be a change in baseline offsite conditions as a result of other unrelated development proposals pursued in the wider area. However, from a land quality perspective, new developments are not likely to introduce significant impacts to current baseline if these developments comply with the statutory and regulatory requirements. Since new developments will not introduce new potential contamination sources or new receptors that are not already considered in the current baseline, assessment based on current baseline is expected to be valid.

13.6 Embedded and good practice measures

13.6.1 In the assessment of the likely significant effects from ground conditions and contamination identified in the baseline there are several embedded good practice measures that are assumed and relied upon in the assessment. Such good practice measures include actions that would be undertaken to meet standard good practices.

13.6.2 Good practice measures relating to environmental management would be employed such that the works themselves would be controlled to ensure that they do not have an adverse impact on the local environment. The site would be developed in line with the WCC (2016) Code of Construction Practice (CoCP). The requirements of the CoCP are incorporated into the draft Construction Management Plan (CMP) (Ref: EBR-14). The CoCP sets out the minimum standards and procedures for managing and minimising the environmental impacts of construction projects within the City of Westminster. It is assumed that the construction works would not further contaminate the ground on the site.

Waste management

13.6.3 The CoCP and good practice sustainability principles require that spoil and waste (including wastewater) would be disposed of appropriately and according to the waste hierarchy, minimising waste. Wherever possible waste soils would be sent offsite to soil recycling and recovery facilities to minimise waste to landfill. Depending on contamination levels in soils, they may be sent directly for reuse, or they may require offsite treatment prior to reuse. Even some soils with high levels of contaminants, including low level asbestos, may be recycled at appropriate facilities.

13.6.4 The amount of wastewater discharged will be minimised in accordance with the CoCP. Dewatering and disposal measures must be agreed in advance with the Environment Agency and where required, an environmental permit obtained[97]. Discharge to canals or other waterways will not be permitted without prior agreement with the Canal & River Trust.

Asbestos in soils

13.6.5 The Control of Asbestos Regulations (CAR) 2012[98] would be followed if asbestos is encountered. All works with asbestos require a written plan of work detailing how that works is to be carried out. Exposure limits and measurement methods for asbestos must be adhered to and specialist contractors appointed.

13.6.6 The guidance set out in CAR-SOIL[99] would be followed. In some cases, the works may require notification or additionally may require licensed contractors if more significant and high risk ACM is encountered.

Piled foundations

13.6.7 Piled foundations would be designed such that they would not create preferential pathways for contaminant migration. A foundation works risk assessment (FWRA) would be completed for any piled foundations that fully penetrate the London Clay. Appropriate design of piled foundations based on this assessment would mitigate the potential effect on the lower aquifer from piling.

Ground source heat pump

13.6.8 A ground source heat pump is proposed which will include deep groundwater production and injection wells into the Chalk Principal Aquifer. The installation of deep boreholes will be undertaken using clean drilling techniques, using multiple cases and seals to eliminate the potential for any contamination to migrate to the principal aquifer.

Building materials

13.6.9 Concrete and building materials to be used in the ground would be appropriately specified based on the ground conditions and would be tailored to the site-specific soil aggressivity. This would mitigate any effect on building materials from ground conditions and contamination.

Unexploded ordnance (UXO)

13.6.10 The risk from UXO to the development is a health and safety risk that would be managed under application of the CDM Regulations. Appropriate management and response plan would be drafted in accordance with CIRIA C681[100].

[97] Environmental Permitting (England and Wales) Regulations SI 2016/1154
[98] Control of Asbestos Regulations 2020 (SI 2012/632).
[99] CAR-SOIL (CL:AIRE & JIWG) (2016), Control of Asbestos Regulations 2010, Interpretation for managing and working with asbestos in soil and construction and demolition materials, industry guidance.
[100] CIRIA (2009) C681 Unexploded ordnance (UXO) A guide for the construction industry

Ground investigation

13.6.11 A ground investigation has been scoped to investigate the identified potential plausible contaminant linkages and an outline is included in Section 6.2.1 of the PRA (Appendix J2). The purpose of the ground investigation is to establish the underlying ground conditions and characterise any contamination at the site. The ground investigation will include sampling and testing of soil, groundwater and ground gases.

13.6.12 The ground investigation commenced in March 2020 and is ongoing. The results of the ground investigation have not yet been finalised. The findings of the ground investigation will be used to inform a ground contamination risk assessment, considering human health, controlled waters and define the requirement for any remediation of the site.

13.7 Assessment

Construction effects

13.7.1 The PCLs identified in Table 38 will be mitigated to some extent by the embedded and good practice measures detailed in Section 0. The assessment of the likely magnitude of effects is described below.

Human health

13.7.2 The construction works will include excavations and handling of soil associated with the proposed basement, foundations, landscaping and utilities. Ground workers may be required to handle potentially contaminated soils or groundwater during construction. The likelihood of effects on construction workers, site neighbours and members of the public from dermal contact, ingestion and inhalation would be reduced by good practice measures including PPE for construction workers, and general dust controls, which will be described in the CMP (Ref: EBR-14).

13.7.3 The conceptual site model concluded the risk of harm to human health associated with the construction of the development (without additional mitigation) ranged from low to moderate. There is a potential for contamination of soil and groundwater, which may include volatile or mobile contaminants in soil and groundwater, and the potential for asbestos to be present in soils. This will be characterised by ground investigation to appropriately inform future works as described in paragraph 13.6.11.

13.7.4 There is the potential for human exposure to contaminated soils, contaminated dust, dust and groundwater which without additional mitigation, could result in a **significant moderate adverse effect** on human health.

Controlled waters

13.7.5 The risk of pollution to the RTD secondary A (upper) aquifer was recorded as moderate in the conceptual model. There is potential for contamination to leach from contaminated soils due to infiltration of rainwater and increased disturbance of the ground during construction works. The secondary A aquifer is a medium

sensitivity receptor and the proposed construction works could result in a **significant minor adverse effect**.

13.7.6 The effect on the deep aquifer from contamination migrating along preferential pathways during piling (which is unlikely) and boreholes for the ground source heat pump would be fully mitigated by good practice in pile design and assessment as described in paragraph 13.6.7 and would therefore be **negligible** and **not significant**.

Building materials and services

13.7.7 The conceptual model identifies a PCL where building materials and services may be in direct contact with the various contamination sources. There are embedded procedures through investigation and specification such that appropriate materials and protection will be provided. Therefore, the effect of contamination on building materials and services would be **negligible** and **not significant**.

Ecological receptors

13.7.8 There are no nationally designated ecological receptors onsite and this is scoped out of the assessment. The potential effects on new landscaping and plants is discussed in the existence effects assessment below.

Existence effects

13.7.9 Removal of potentially contaminated Made Ground and superficial deposits could occur which will be limited to the areas of basement. The existence effects of the development to the local environment would be **negligible** and **not significant**.

13.7.10 New landscaping will be formed for planting. There is a potential for phytotoxic contamination in soil which could give rise to a **minor adverse effect** to plants.

Operational effects

Human health

13.7.11 Human health receptors during the operation of the Proposed Development will be the future site users (residents, workers and site visitors) and maintenance workers.

13.7.12 The potential risk to future site users from ground contamination, through dermal contact, ingestion of soil and dust, inhalation of dust and ground gases or vapours without mitigation, was identified to be moderate. A risk to future site users through the consumption of home-grown produce grown in communal productive gardens onsite was assessed to be low. The risk to maintenance workers was identified as low as works will be infrequent, of short duration and controlled through appropriate good practices and PPE.

13.7.13 Climate change during operation may result in drying of soils, through longer hotter periods resulting in cracking of soils and cover layers, increased permeability and creation of dusts. In addition, the rise and fall of groundwater

levels could affect vapour and gas movement (if present). This could result in increased vapour and gas exposure and increased mobilisation of potentially contaminated dusts over longer periods.

13.7.14 Human health receptors are a medium to high sensitivity receptor. The significance of the effects associated with human health receptors during operation effects could be **moderate adverse significant effects**, prior to mitigation.

Controlled waters

13.7.15 With appropriate control of infiltration and drainage design, the potential effect on controlled waters during operation is **negligible**.

13.8 Additional mitigation

General

13.8.1 To address the identified potential significant adverse effects to human health and controlled waters (during construction and operation), it will be necessary to complete the proposed ground investigations across the site. The objectives and scope of the proposed investigations is described in the PRA (Appendix J2). The results of the ground investigation will be assessed in a ground contamination risk assessment for human health, controlled waters and environmental receptors. The outcomes of the risk assessment will inform the requirements for remediation. The scope of remediation (if required) will be defined in a remediation strategy, which will include a verification plan.

13.8.2 The risk assessment and remediation strategy will be agreed with the local authority. The approach will include a watching brief and protocol if unexpected contamination is encountered during construction.

13.8.3 A programme of ground gas and vapour monitoring will be undertaken to assess the requirements for protection of new buildings in accordance with best practice guidance.

13.8.4 The investigation will assess the suitability of existing landscaping soils to be reused onsite. Areas of new landscaping and public open space will be provided with certified soil which will be free from contamination and specified to an appropriate thickness for planting. The requirements will be agreed with the local authority as part of a remediation strategy.

13.8.5 Verification of any remediation will be required to include any gas protection for new buildings and provision of landscaping. Good practice on the testing and verification of protection systems for buildings against hazardous ground gases is set out in CIRIA C735. The outcome of any remediation will be presented in a verification report on completion.

Enhanced health and safety

13.8.6 If significant asbestos contamination is encountered during the ground investigation, earthworks or construction, including significant amounts of free fibres or disaggregated asbestos containing materials (ACM) then significantly

enhanced control measures will be required to address the identified potential significant adverse effects to human health during construction (groundworks). Examples include:

- Specialist contractors will be used, with the works planned and defined in advance;
- Enhanced PPE for construction workers;
- Proactive damping down to reduce dust (and fibre) exposure to as low as reasonably practicable; and
- Asbestos fibre monitoring for key receptors, either in the breathing zone of workers or at site boundaries.

13.8.7 The guidance set out in CAR-SOIL will be followed. In some cases, the works may require notification or additionally may require licensed contractors if more significant and high risk ACM is encountered.

13.8.8 If non-aqueous phase liquids (NAPL) and vapours are identified enhanced health and safety measures will be required, such as specific chemical resistant PPE and respiratory protective equipment (RPE).

13.9 Residual effects

13.9.1 The residual effects considered likely, once the mitigation measures described above have been adopted and implemented, are presented below.

Construction effects

13.9.2 The initial assessment indicated the potential for significant moderate adverse effects to human health and controlled waters. These effects can be mitigated through compliance with the various mitigation measures described in Section 13.8. The mitigation will be set out in an appropriate remediation strategy, which will be based on the ground investigation and contamination risk assessment, to be agreed with the local authority.

13.9.3 The residual construction effects on both human health and controlled waters are **negligible** and **not significant**.

Existence effects

13.9.4 No additional mitigation has been proposed with respect to existence effects related to ground conditions and contamination as the effects are no significant. As such the effects would be as reported in Section 5.8.

Operational effects

13.9.5 The initial assessment indicated the potential for significant moderate adverse effects to human health. These effects can be mitigated through compliance with the various mitigation measures described in Section 13.8. The mitigation will be set out in an appropriate remediation strategy to be agreed with the local authority.

13.9.6 The residual construction effects on both human health and controlled waters are **negligible and not significant**.

13.10 Cumulative effects

13.10.1 Under existing regulatory and planning requirements, all of the identified developments in Appendix A5 would be required to have appropriate measures in place during the demolition and construction phases (such as remediation and dust control) and during operation to minimise potential risks to human health and the environment. As such, the development of these sites would not result in cumulative effects related to ground conditions.

13.11 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Human Health	Construction works, particularly excavations for basements, piling, utilities and landscaping would disturb the existing ground	Exposure to contaminated soil, vapours, gases, contaminated dust and contaminated groundwater via dermal contact, ingestion or inhalation. The sensitivity of the receptor is medium to low. Effects range from moderate to minor.	Moderate adverse	Completed ground investigation, risk assessment and agreed remediation strategy and verification. Enhanced health and safety, construction practices and appropriate material management strategy.	Negligible	Not applicable
Controlled waters	Key works include piling and basement excavation.	Mobilisation and migration of contamination during construction, through new preferential pathways introduced by piling. The sensitivity of the receptor is medium. Effects are minor. FWRA for any piled foundations that fully penetrate the London Clay.	Minor adverse	Completed ground investigation, risk assessment and agreed remediation strategy and verification.	Negligible	Not applicable
Building materials and services	Building materials in direct contact with contamination	Materials in direct contact may degrade, reducing their capacity. The sensitivity of the receptor is low. Materials will be specified as resistant to ground conditions and the effect is negligible.	Negligible	No additional mitigation required.	Negligible	Not applicable

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Controlled waters and environment	Geological strata and shallow groundwater in direct contact with Made Ground	Removal of potentially contaminated Made Ground and superficial deposits from beneath the site. The sensitivity of receptor is medium, and the effect is minor.	Negligible	No additional mitigation required.	Minor beneficial	Not applicable
Flora and fauna	No designated ecological receptors. Plants may be affected by residual contamination.	The sensitivity of the receptor is low, the effect is minor adverse.	Minor adverse	Completed ground investigation, risk assessment and agreed remediation strategy and verification. Landscaping soil to be appropriately specified (quality and thickness).	Negligible	Not applicable
Use/Operation – effects arising from the use of the development						
Human health	Residual contamination with a potential ground gas or vapour source. Potential for soil and dust exposure.	The sensitivity of the receptor is medium to high. Effects range from moderate to minor.	Moderate adverse	Completed ground investigation, risk assessment and agreed remediation strategy and verification. Gas and vapour protection in new buildings (if required). Landscaping cover layers..	Negligible	Not applicable
Controlled waters	Long term infiltration and leaching of contaminants	Control of infiltration and drainage design. The sensitivity of the receptor is medium, the effect is negligible.	Negligible	No additional mitigation required.	Negligible	Not applicable

14 Noise and vibration

14.1 Introduction

14.1.1 This section describes the likely significant effects of the Proposed Development on noise and vibration. It outlines the methodology, the baseline conditions and the likely effects associated with the construction and operation of the Proposed Development. Mitigation measures which would be implemented to reduce the effects of the Proposed Development on noise and vibration are also described, where relevant.

14.2 Scope of the assessment

14.2.1 The scope of the assessment of noise and vibration is summarised in Table 39.

Table 39: Noise and vibration assessment scope

Assessment	Construction	Existence	Operation
Construction site works	✓	n/a	n/a
Traffic noise	✓	n/a	×
Noise from fixed plant and occupation noise	n/a	n/a	✓

14.2.2 A Scoping Opinion was received from Westminster City Council (WCC) on 6th December 2019. This included five comments relating to noise and vibration. Responses to these comments are detailed in Appendix A3.

14.2.3 In summary, the assessment would additionally consider the following areas of impact: noise and vibration during the different phases of construction; service and delivery trips; and, in a separate appendix, noise and vibration of existing environmental sources on the future occupiers of the Proposed Development.

14.3 Consultation

14.3.1 It was agreed through consultation with the Environmental Health Officer (EHO) at Westminster City Council that the noise survey locations were appropriate for assessing the impact of environmental noise produced by the Proposed Development.

14.4 Methodology

Overview

14.4.1 This section outlines the methodology for assessing the likely significant effects on noise and vibration from the demolition, construction, and operation of the Proposed Development. Full details of the methodology can be found in Appendix K1.

14.4.2 In all cases significance criteria have been developed to take account of Planning Practice Guidance for noise (PPG-N). PPG-N draws on the principles of the Noise Policy Statement for England (NPSE), in particular the concepts of No Observed Effect Level (NOEL), Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL). These concepts are described in detail in Appendix K1.

Baseline

14.4.3 A detailed noise and vibration survey was carried out by Arup acousticians, over the period 12th – 26th January 2018. The survey consisted of both short-term attended and long-term unattended measurements. The measurement locations (as shown in Figure 20) were selected to represent the existing noise levels at the nearest sensitive receptors, and at the proposed residential facades. The results are summarised in Table 44 and Table 45, with full details in Appendix K2

14.4.4 Between 2018 and the future baseline year (2028), the dominating noise sources in the locality are not expected to change substantially, i.e. there is a small change in traffic flows, and no major development affecting noise climate. Therefore, the future baseline noise levels are assumed to be represented by the existing noise levels for the construction activity and operational effects.

14.4.5 Since the baseline noise and vibration surveys were completed, Edgson House, has been demolished. These changes are not expected to alter the baseline conditions at the nearest noise and vibration sensitive receptors.

Demolition and construction effects

Demolition and construction noise

14.4.6 For the assessment of demolition and construction noise and vibration effects, the assessment has been focused on the closest sensitive receptors, where any potential impacts would be greatest.

14.4.7 Noise from construction activities has been calculated using the approach presented in BS5228-1[101]. This uses the schedule of construction plant and processes that are likely to be required for the Proposed Development and the construction programme provide contained in Appendix K3.

14.4.8 The assessment assumes that works would be undertaken using best practicable means (BPM) as required by Section 72 of the Control of Pollution Act and described in BS5228-1.

Significance criteria for residential receptors

14.4.9 The thresholds for determining potentially significant construction noise effects have been determined using the ABC method described in Annex E of BS5228-1 and the measured noise levels (given in Table 44 and Table 45).

[101] British Standard BS5228:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 1 Noise

14.4.10 Measured free-field ambient noise levels have been converted to façade levels by adding 3dB, as specified in BS5228-1.

Table 40: Demolition and construction noise LOAEL (façade levels)

Receptor	Weekday daytime (0700 - 1900) $dBL_{Aeq,12hr}$	Saturday morning (0700 – 1300) $dBL_{Aeq,6hr}$
No. 1 Ebury Bridge	70	65
Ebury Place	75	70
Cheylesmore House	70	70
20 – 42 Ebury Bridge Road	75	75
On-site receptors	75	75

14.4.11 The assessment of EIA significance is determined by evaluating the construction noise thresholds along with other factors, such as the number of receptors and their sensitivity.

14.4.12 The above potential significance criteria are adopted as the LOAEL. Where these are exceeded, an adverse effect is indicated.

14.4.13 The Category C values defined in BS5228-1 have been adopted as the SOAEL. Where these are exceeded, a significant observed adverse effect level is indicated, in government policy terms. These are shown below.

Table 41: Demolition and construction noise SOAEL (façade levels)

Period	Noise level $dBL_{Aeq,T}$
Day (07:00 – 19:00), T=12hr	75
Saturday (07:00 – 13:00), T=6hr	75

Demolition and construction traffic noise

14.4.14 The assessment area for demolition and construction road traffic noise effects has been determined from gathered traffic information. Routes which could result in greater than negligible noise change have been evaluated in the assessment.

14.4.15 The noise exposure arising from changes in traffic flows and heavy goods vehicle (HGV) composition has been calculated using the Calculation of Road Traffic Noise (CRTN)[102], to derive the Basic Noise Level (BNL) at locations 10m perpendicular from the kerb. This enables an assessment of the change in noise level due to construction traffic on specific sections of road.

14.4.16 The criteria used to determine the magnitude of construction traffic noise impacts has been evaluated by reference to Table 3.54 of Design Manual for Roads and Bridges (DMRB), LA 111[103]. Significance criteria for traffic noise effects are detailed in Appendix K1.3.

[102] Department of Transport Welsh Office HSMO, 1988. *Calculation of Road Traffic Noise (CRTN)*
[103] Highways England, Transport Scotland, Welsh Assembly, Department for Infrastructure, Northern Ireland (2019), Design Manual for Roads and Bridges LA 111, Noise and Vibration, Revision 1, TSO

Demolition and construction vibration

14.4.17 Vibration from construction sources has been predicted using the procedures described in BS5228-2[104] and data provided by TRL Report LR 429[105].

14.4.18 The risk of vibration causing damage to buildings is assessed in terms of the peak particle velocity (PPV) at the base of the building. The building damage risk criteria given in the table below have been applied to all buildings, below which there is no risk of building damage.

Table 42: Assessment criteria for risk of building damage from vibration

Category of building	Peak particle velocity (PPV) at building foundation	
	Transient[1] vibration	Continuous[2] vibration
Potentially vulnerable buildings[3]	≥6 mm/s	≥3 mm/s
Structurally sound buildings	≥12 mm/s	≥6 mm/s

[1]Transient vibration relative to building response such as impulsive vibration from percussive piling.
[2]Continuous vibration relative to building response such as vibrating rollers.
[3]BS7385-2 highlights that the criteria for aged buildings may need to be lower if the buildings are structurally unsound. The standard also notes that criteria should not be set lower simply because a building is important or historic (listed).

14.4.19 These criteria are derived from BS7385-2[106] and ensures there is no risk of the lowest damage category ('cosmetic') being exceeded, as defined in *BS ISO 4866:2010*[107]

14.4.20 The magnitude of the impacts on human exposure in buildings has been evaluated by reference to guidance in BS5228-2. The adopted LOAEL and SOAEL for these effects are below.

Table 43: Human exposure to vibration in buildings, LOAEL and SOAEL

Effect level	Vibration level	Effect
LOAEL	0.3 mm/s	Vibration might be just perceptible in residential environments
SOAEL	1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents

14.4.21 As for noise, the vibration assessment assumes the use of BPM.

[104] British Standard BS5228:2009+A1:2014. Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 2 Vibration
[105] Hiller, DM, Crabb, GI, 2000. TRL Report 429-2000, *Groundborne Vibration caused by mechanised construction works*. Transport Research Laboratory, Berkshire.
[106] British Standard BS7385:1993 Part 2 Evaluation and measurement for vibration in buildings – Guide to damage levels from groundborne vibration
[107] British Standard BS4866:2010 Mechanical vibration and shock – Vibration of fixed structures – Guidelines for the measurement of vibrations and evaluation of their effects on structures

Operational effects

14.4.22 For the assessment of operational noise effects, the assessment has been focused on the closest sensitive receptors, where any potential impacts would be greatest.

Fixed plant noise

14.4.23 Fixed plant noise has been assessed with regards to C46AB of WCC's standard planning conditions and reasons (December 2013) and BS 4142:2014 Methods for rating and assessing industrial and commercial sound.

14.4.24 Condition C46AB states that for areas where the existing ambient noise level exceed World Health Organisation (WHO) guideline levels (as is the case for the Proposed Development):

"where noise emitted from the proposed plant and machinery will not contain tones or will not be intermittent, the 'A' weighted sound pressure level from the plant and machinery (including non-emergency auxiliary plant and generators) hereby permitted, when operating at its noisiest, shall not at any time exceed a value of 10 dB below the minimum external background noise (dBL$_{A90,15mins}$), at a point 1 metre outside any window of any residential and other noise sensitive property"

14.4.25 Where noise emissions would contain tones or be intermittent, the level at noise sensitive properties shall be at most 15 dB below the minimum external background noise level (dBL$_{A90,15mins}$).

14.4.26 For emergency plant and generators, noise has been assessed with regards to C50 of WCC's standard planning conditions and reasons. This states that noise emitted from the emergency plant and generators shall be at most 10 dB above the minimum external background noise level (dBL$_{A90,15mins}$).

Occupation noise effects

14.4.27 Occupation noise from the proposed community spaces has been assessed with regards to C47AB of WCC's standard planning conditions and reasons (December 2013).

14.4.28 This states that noise emitted from the proposed internal activity in the development shall not exceed a level of 5 dB below the minimum external background noise level at the nearest sensitive receptor, if the noise does not contain tones or is not intermittent.

14.4.29 If the noise emitted does contain tones or is intermittent, then a level of 10 dB below the minimum external background noise level shall not be exceeded, at the nearest noise sensitive receptor.

Cumulative effects

14.4.30 The assessment of cumulative effects has been undertaken using information already available from the committed developments within the study area as presented in Appendix A5.

14.5 Assumptions and limitations

14.5.1 For the assessment of operational and construction noise, it is assumed that between 2018 and the future baseline year (2028), the dominating noise sources in the locality would not change substantially. Therefore, the measured baseline noise levels from the 2018 survey, are suitable for assessing the effects of operational for the future baseline year.

14.6 Baseline

14.6.1 The site is in a busy urban environment where the baseline noise climate is dominated by a mixture of road traffic from Ebury Bridge Road and Ebury Bridge, which border the site to the west and north respectively, and the major railway lines to the east of the site.

14.6.2 Sensitive receptors have been identified based on their locality to the Proposed Development. These are No. 1 Ebury Bridge to the north, Ebury Place to the east, Cheylesmore House to the south, and the terraced properties of 20-42 Ebury Bridge Road to the west. The assessment has focused on these residential areas closest to the site where any potential impacts would be greatest.

14.6.3 Noise measurement locations and the nearest sensitive receptors are shown in Figure 20.

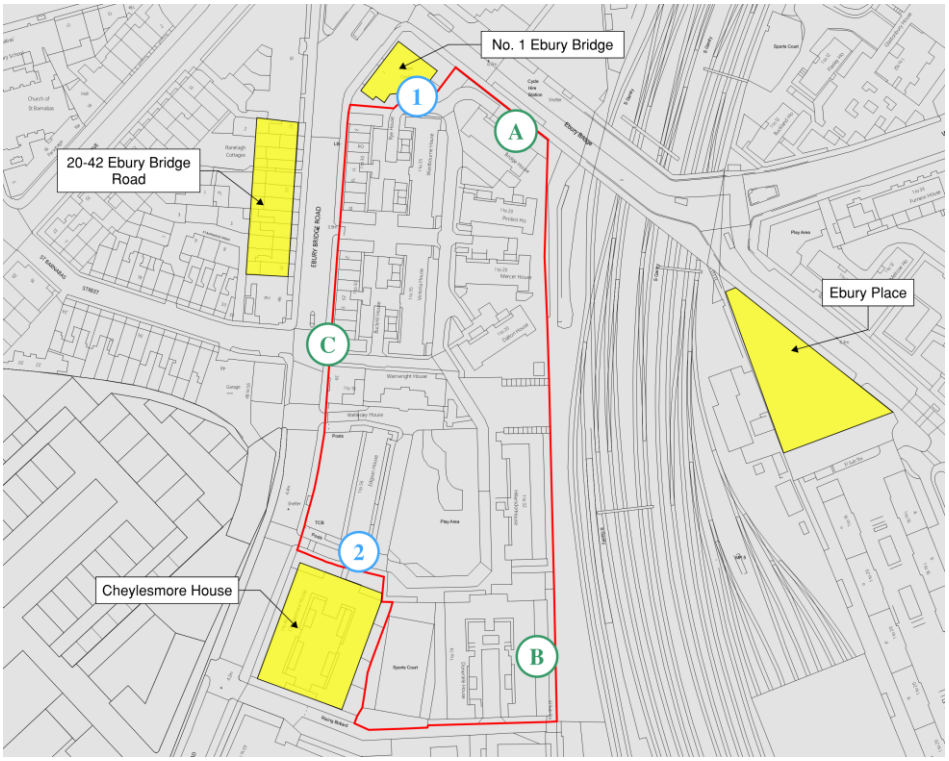

Figure 20: Noise survey locations (A-C and 1, 2) and nearest sensitive receptors (yellow)

14.6.4 Summaries of the baseline measurement results are below. Full details of the survey are in Appendix K2.

14.6.5 The $dBL_{A90,15mins}$ levels shown are the minimum measured level during the representative period at each location. The $dBL_{Aeq,T}$ levels shown are the

logarithmically averaged measured levels during the representative period at each location.

Table 44: Summary of daytime (07:00 – 23:00) measurements

Location	Attended / unattended	Measurement type	Minimum background noise level $dBL_{A90,15mins}$	Ambient noise level $dBL_{Aeq,16hr}$
A	Unattended	Facade	48	70
B	Unattended	Facade	47	68
C	Unattended	Facade	43	68
1	Attended	Free-field	52	57
2	Unattended	Façade	43	64

Table 45: Summary of night-time (23:00 – 07:00) measurements

Location	Attended / unattended	Measurement type	Minimum background noise level $dBL_{A90,15mins}$	Ambient noise level $dBL_{Aeq,8hr}$
A	Unattended	Facade	41	62
B	Unattended	Facade	43	61
C	Unattended	Facade	40	63
2	Unattended	Façade	39	56

14.7 Embedded and good practice measures

14.7.1 Construction works would be managed to control noise in accordance with the principles of best practicable means (BPM) as required by the Control of Pollution Act (CoPA). A complete list of BPM is found in the draft Construction Management Plan (CMP) (Ref: EBR-14) which complies with WCC's Code of Construction Practice (CoCP). Measures most relevant to this assessment are:

- site hoarding surrounding the construction site, with a 2.44m minimum height and a surface density of not less than 7kg/m^2;
- where practicable and required, quiet working methods should be employed, including the use of electrically powered fixed items of plant rather than diesel- or petrol-drive plant;
- equipment should be switched off when not in use;
- the siting of noisy plant or equipment should be considered to avoid noise being directed towards noise sensitive receptors; and
- demolitions should be sequenced so as to leave structures in place that may shield sensitive buildings from noise for as long as practicable.

14.8 Assessment

Construction effects

14.8.1 Assumptions on items of construction plant and their operational 'on-times' are based on information provided by the construction project manager team; details

of this are provided in Appendix K3. Construction effects are assessed for the weekday and Saturday morning period only as most of the construction work would be undertaken during these periods as outlined in WCC's CoCP. Section 61 consents would be sought from WCC for any works to be undertaken outside of these periods.

14.8.2 The construction assessment also includes demolition activities associated with the Prior Approval a Prior Approval Application in 2019 (Application Ref: 19/06951/APAD).

Construction noise

14.8.3 Noise from the following daytime activities has been assessed:

- Activity 1 – Site preparation and remediation;
- Activity 2 – Foundations and piling;
- Activity 3 – Erection of structure; and
- Activity 4 – Fitting out.

14.8.4 Construction activities have been assessed for each phase of the masterplan as described in Section 3.4 and shown in Parameter Plan EBE-AST-XX-XX-DR-A-011102.

14.8.5 To consider a worst-case scenario, a partial attenuation correction of 5 dB has been considered for the hoarding screening effect at all receptors.

14.8.6 The calculated construction noise levels presented are 'worst-case' insofar as they represent the entirety of a particular construction activity (see Section 14.8.3) being located 10m inside the nearest part of the site perimeter to the noise sensitive receptors and operating simultaneously.

14.8.7 The predicted daytime construction noise levels at receptors for each construction activity and phase are presented in Appendix K3.

14.8.8 Exceedances of the adopted significant thresholds (see Table 40) have been predicted during all phases of the development.

14.8.9 During Activity 1 of the construction of the Detailed Area, an exceedance of 1 dB above the LOAEL is predicted at Cheylesmore House. This signifies an adverse impact with the potential to cause a significant adverse effect. The action under Planning Practice Guidance would be to mitigate and reduce to a minimum.

14.8.10 During construction of the Outline Area, substantial exceedances of the significance thresholds are predicted for all receptors except Ebury Place. This signifies an adverse impact with the potential to cause a significant adverse effect. Importantly the predicted noise levels exceed the adopted SOAEL. The action under Planning Practice Guidance would usually be to avoid such effects.

14.8.11 Even when considering that the assessment represents a worst case, the construction noise effects are assessed as a **significant adverse effect** for all noise sensitive receptors closest to the works.

14.8.12 Where receptors remain on site in the Outline Area during the construction of the Detailed Area, the construction noise effects at these receptors is assessed as a **significant adverse effect.**

14.8.13 Where more distant noise sensitive receptors have un-screened line-of-sight of the Proposed Development, significant adverse effects are likely. These include the residential buildings:

- on the eastern end of St Barnabus Street;
- at the eastern side of the committed development Chelsea Barracks;
- Moore House and Wentworth House to the immediate south of the Proposed Development; and
- 203 Buckingham Palace Road to the north of the Proposed Development.

14.8.14 The construction noise effects on the non-residential development Ebury Meanwhile are assessed to exceed guideline noise levels for community uses. The construction noise effects at this receptor is therefore assessed as a **significant adverse effect.**

Construction vibration

14.8.15 Construction vibration would be expected to occur at some level during the excavation (earthworks) and piling phases. Vibration causing activities likely to be carried out during the construction of the Proposed Development include:

- vibratory compaction, and
- bored piling.

14.8.16 The full results and details of assumptions used in the prediction calculations are found in Appendix K3.

14.8.17 The maximum PPV associated with vibratory compaction activities has been predicted to be 2.6 mm/s, at No. 1 Ebury Bridge. This level is above the adopted SOAEL regarding human exposure to vibration. The action under Planning Practice Guidance would usually be to avoid such effects.

14.8.18 Levels at Cheylesmore House and the Detailed Area of the Proposed Development are also predicted to be above the adopted SOAEL.

14.8.19 These levels are predicted only when the compaction vehicle is passing the receptor at the nearest point on the site. It is therefore a temporary effect, with short duration.

14.8.20 The maximum PPV associated with piling activities of the Proposed Development has been predicted to be 0.72 mm/s, at No. 1 Ebury Bridge. Perceivable levels of vibration are also predicted at Cheylesmore House, 20 - 42 Ebury Bridge Road, and at buildings associated with the Detailed Area and the Outline Area of the Proposed Development.

14.8.21 In terms of government policy, these levels are above the adopted LOAEL, but below the SOAEL regarding human exposure to vibration. The action under Planning Practice Guidance would be to mitigate and reduce to a minimum.

14.8.22 As these levels have been calculated for the compaction and piling activities closest to the receptors, they represent a worst-case level and would only be experienced temporarily.

14.8.23 The calculated level of vibration during compaction and piling activities could be perceptible to people within their houses. However, the human disturbance effects associated with this level of vibration exposure could be tolerated by appropriate liaison with the building occupants providing prior warning to any works. Additionally, these works would be relatively short in duration.

14.8.24 The effects of construction vibration in relation to human exposure have therefore been assessed as **not significant**.

14.8.25 The risk of excessive ground borne vibration in relation to building damage is below the threshold for potential cosmetic damage and has therefore been assessed as **not significant**.

Construction traffic

14.8.26 DMRB LA 111[103] indicates a potential significant traffic noise effect associated with changes of 3 dB or more. This threshold of significance has been applied to this assessment. The full table of impact levels can be found in Appendix K1.3.

14.8.27 Traffic data has been provided by the construction and traffic and transport teams to enable a prediction of the noise levels on the site access road links, for the baseline and future baseline years. The site access road links have been provided in the draft CMP (Ref: EBR-14). These are shown in Figure 21.

14.8.28 Calculations of the noise levels have used the maximum HGV movements per day during any period of the construction, to represent the worst-case scenario. In the absence of detailed information of traffic routing, each assessed link has been attributed the maximum HGV movements per day. The full data set used for construction traffic calculations has been included in Appendix K4.

14.8.29 To assess the effects from construction traffic noise, a comparison of the 2018 baseline traffic flows has been compared against predicted traffic flows for the future baseline year (2028) including the predicted HGV flows. The predicted change in traffic noise is presented in Table 46.

Figure 21: Local road links assessed for construction road traffic noise (Proposed Development shown in red hatch)

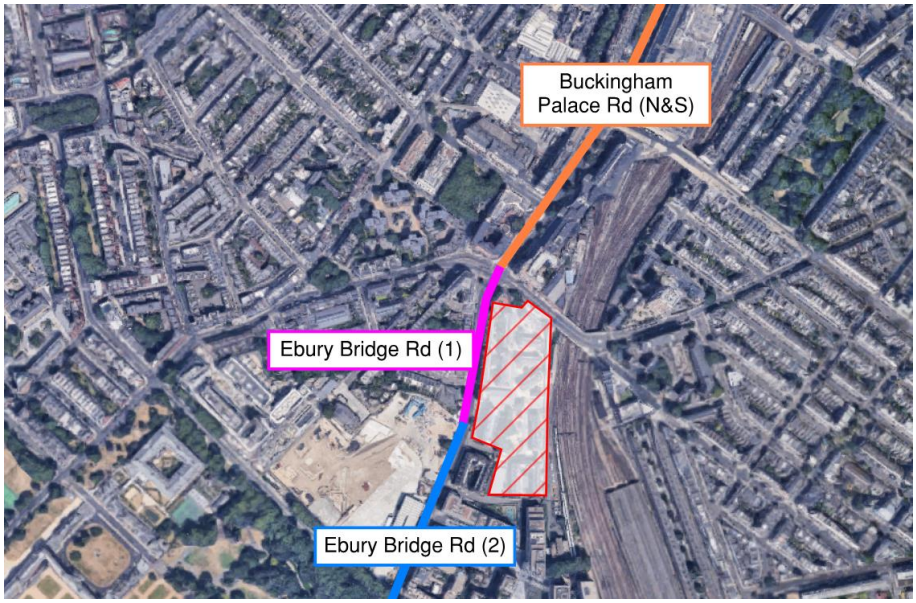

Table 46: Predicted construction traffic noise and assessed impacts

Road link	Basic noise level $dBL_{A10,18h}$		Change in noise level	Impact
	Baseline (2018)	Future baseline (2028) + Construction traffic		
Ebury Bridge Road (1)	62.9	63.1	0.2	Negligible
Ebury Bridge Road (2)	65.0	65.2	0.2	Negligible
Buckingham Palace Road (southbound)	63.4	63.4	0.1	Negligible
Buckingham Palace Road (northbound)	64.1	64.1	0.0	Negligible

14.8.30 The increase in construction traffic and HGVs are negligible. The effects of construction traffic noise are **not significant**.

Operational effects

Fixed building services plant noise

14.8.31 For this assessment, it is assumed that the fixed plant associated with the development would be selected to not produce any acoustically distinguishable tones or intermittency.

14.8.32 The significance criteria are based on condition C46AB and C50 of WCC's standard planning conditions and reasons. Limiting noise to below these thresholds would ensure that there are no significant effects at nearby residential or other sensitive receptors.

14.8.33 The criteria represent a noise level limit measured 1 metre outside any window of any residential and other noise sensitive property.

Table 47: Fixed plant noise significance criteria (façade levels)

Receptor	Measurement location (refer to Figure 20)	Significance criteria ($dBL_{Aeq,T}$)	
		Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
No. 1 Ebury Bridge	1*	42	29
Ebury Place	B	37	33
Cheylesmore House	2	33	29
20-42 Ebury Bridge Road	C	33	30
* Daytime only, other periods derived from measurements taken at other locations			

14.8.34 As the noise level produced by fixed plant would be limited to below the existing background noise level, BS 4142:2014 suggests it is an indication of the sound source having a low impact. This would be secured by a suitable planning condition.

Table 48: Emergency plant noise significance criteria (façade levels)

Receptor	Measurement location (refer to Figure 20)	Significance criteria ($dBL_{Aeq,T}$)	
		Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
No. 1 Ebury Bridge	1*	62	49
Ebury Place	B	57	53
Cheylesmore House	2	53	49
20-42 Ebury Bridge Road	C	53	50
* Daytime only, other periods derived from measurements taken at other locations			

14.8.35 BS 4142:2014 states that when comparing plant noise to the measured background noise level, "a difference of around +10 dB or more is likely to be an indication of a significant adverse impact". However, as the testing of emergency plant is only permitted to be carried out for up to one hour per calendar month, this effect would be temporary.

14.8.36 Achieving the above noise limits would therefore ensure that the effects of noise emissions from fixed plant associated with the Proposed Development are **not significant**.

Occupation noise effects

14.8.37 For the purposes of this assessment, it is assumed that any occupation noise may be intermittent or tonal.

14.8.38 It is not expected that residential uses of the Proposed Development would contribute to any occupational noise effects at nearby sensitive receptors. It is understood that the proposed retail uses would not typically produce high levels of noise i.e. they are not community uses D1/D2.

14.8.39 The below significance criteria are based on condition C476AB of WCC's standard planning conditions and reasons. Limiting noise to below these thresholds would ensure that there are no significant effects at nearby residential or other sensitive receptors.

Table 49: Occupation noise significance criteria (free-field levels, 1m from window)

Receptor	**Measurement location (refer to Figure 20)**	**Significance criteria ($dBL_{Aeq,T}$)**	
		Daytime (07:00 – 23:00)	**Night-time (23:00 – 07:00)**
No. 1 Ebury Bridge	1*	42	29
Ebury Place	B	37	33
Cheylesmore House	2	33	29
20 – 42 Ebury Bridge Road	C	33	30
* Daytime only, other periods derived from measurements taken at other locations			

14.8.40 As the noise level produced by occupation noise would be limited to below the existing background noise level, BS 4142:2014 suggests it is an indication of the sound source having a low impact.

14.8.41 Achieving the above noise limits would therefore ensure that the effects of occupation noise associated with the development are **not significant**.

Servicing and delivery trips

14.8.42 In the absence of information on the number of servicing and delivery trips associated with the Proposed Development, the assessment of their noise effects is necessarily high level.

14.8.43 It is assumed that servicing and delivery traffic would arrive via Ebury Bridge Road. As this is a busy road, the number of additional vehicle movements per day associated with servicing and delivery would be negligible in comparison (a 25% increase in traffic volume is required for even a 1 dB traffic noise increase).

14.8.44 The effects of noise from servicing and delivery trips are therefore assessed as **not significant**.

14.9 Additional mitigation

14.9.1 Additional mitigation measures would need to be provided to reduce construction noise levels at the nearest receptors during construction of the Outline Area. This might include additional physical mitigation (higher noise barriers/hoardings) in combination with real time noise monitoring and reporting. Real time noise monitoring allows for activities on site to be reviewed with the local authority, when thresholds levels are met thus reducing the significance of some of the noisiest activities.

14.9.2 Where despite use of best practical means (BPM), extended periods of elevated construction noise levels are anticipated, and/or significant night-time working becomes necessary, then it is recommended that the contractor seeks a Section 61

agreement with the local authority under the CoPA. A Section 61 is a formal agreement between the contractor and the local authority which allows the contractor and local authority to agree, for example, noise levels and hours of work.

14.10 Residual effects

Construction effects

14.10.1 The implementation of additional mitigation would reduce noise levels at the nearest receptors, but the noise effects would remain **significant** at periods throughout most of the construction activities.

Operational effects

14.10.2 No additional mitigation is required with respect to operational noise effects, as the effects are **not significant**. As such the effects would be as reported in Section 5.8.

14.11 Cumulative effects

14.11.1 The list of developments identified for assessing cumulative effects is presented in Appendix A3. In Table 50 the potential for cumulative effects with each of these developments is summarised. An assessment of the cumulative effects is presented below.

Construction noise

14.11.2 Of the identified committed developments, only Chelsea Barracks is close enough (within 300m) to the Proposed Development for the construction noise of both developments to cumulatively effect the nearest sensitive receptors.

14.11.3 The Proposed Development and Chelsea Barracks would each have controls on construction noise applied at the closest sensitive receptors. For cumulative significant effects to occur, it would be necessary for the construction works to occur concurrently and generate sufficient levels of noise at the receptor that they would increase the total site noise level significantly. It should be noted that effects from the Proposed Development have already been assessed as significant at certain stages of the work.

14.11.4 Therefore, cumulative construction noise effects are cautiously assessed as a potential significant adverse effect, however any such effects would be temporary in nature.

14.11.5 However, it should be noted that the construction noise impacts of the Proposed Development have been assessed as **significant**. Hence any cumulative effects would not alter the overall assessment conclusion.

Construction vibration

14.11.6 As stated above, only Chelsea Barracks is close enough to the Proposed Development for the possibility of construction vibration to cumulatively effect the nearest sensitive receptors.

14.11.7 Of the sensitive receptors identified, only Cheylesmore House is close enough to both development sites to be affected by vibration causing activities i.e. piling.

14.11.8 As the predicted vibration levels at Cheylesmore House due to piling on the Proposed Development have been assessed as negligible, it is not considered that construction activities on the more distant Chelsea Barracks development would lead to cumulative adverse vibration effects.

14.11.9 Therefore, the cumulative effects of construction vibration have been assessed as **not significant**.

Construction traffic

14.11.10 There is a possibility that the cumulative construction traffic from the Proposed Development and the nearby committed developments could increase the background noise levels on the wider road traffic network.

14.11.11 However, even for a worst-case scenario where each of the identified committed developments produces the same peak daily construction traffic flow as the Proposed Development, the predicted increase in noise levels would be not significant.

14.11.12 Therefore, the cumulative effects of construction traffic have been assessed as **not significant**.

Operational noise

14.11.13 During operation, noise from each committed development would be controlled to achieve the noise criteria set by WCC at the nearest noise sensitive receptor. The cumulative impact of the operation of the Proposed Development and other committed developments would therefore be **not significant**.

Table 50: Noise and vibration cumulative effects

Development	Potential for significant cumulative effects	Comments
Thames Tideway Tunnel	No	See above paragraphs for explanation
Chelsea Barracks	Yes – construction noise	Possibility of concurrent construction works to cumulatively effect the receptors between the Proposed Development and Chelsea Barracks. Any such effect would be temporary in nature.
Battersea Power Station	No	See above paragraphs for explanation
Cringle Dock Waste Transfer Station	No	See above paragraphs for explanation

14.12 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Residential receptors: No. 1 Ebury Bridge, Ebury Place, Cheylesmore House, 20 - 42 Ebury Bridge Road	Construction traffic noise. Potential rise in ambient noise levels due to increased amount of traffic on the road network during construction phases. Short to medium term impact	Significance thresholds at receptors are not exceeded.	Not significant	No significant adverse effects, therefore mitigation not required	Not significant	Not significant
Residential receptors: No. 1 Ebury Bridge, Ebury Place, Cheylesmore House, 20 - 42 Ebury Bridge Road, Existing on-site occupied residential properties. Commercial receptors: Ebury Meanwhile	Construction noise. Potential rise in ambient noise levels due to construction activities on the site. Short to medium term impact	Significance thresholds at receptors are exceeded.	Significant adverse effect	Additional physical mitigation, real-time noise monitoring	Significant adverse effect	Significant adverse effect possible
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Scoped out						
Use/Operation – effects arising from the use of the development						
Residential receptors: No. 1 Ebury Bridge, Ebury Place, Cheylesmore House, 20 - 42 Ebury Bridge Road	Operational noise. Potential rise in background noise levels at receptors, due to operational building services associated with the development. Long term impact	Significance thresholds have been set in accordance with WCC policy. Complying with these would ensure no adverse effects.	Not significant.	No significant adverse effects, therefore mitigation not required	Not significant	Not significant

Table 51: Vibration assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Residential receptors: No. 1 Ebury Bridge, Ebury Place, Cheylesmore House, 20 - 42 Ebury Bridge Road	Construction vibration. Potential increase in vibration levels due to construction activities rising above recommended values for occupant comfort or building structural damage. Short term impact	Building structural damage: Significance thresholds at receptors are not exceeded. For occupant comfort: Significance thresholds at receptors are exceeded during compaction and piling activities. Occupant discomfort may occur temporarily.	Not significant	No significant adverse effects, therefore mitigation not required	Not significant	Not significant
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Scoped out						
Use/Operation – effects arising from the use of the development						
Scoped out						

15 Socio-economics

15.1 Introduction

15.1.1 This section describes the likely significant effects of the Proposed Development on socio-economics. It outlines the methodology, the baseline conditions and assesses the significance of socio-economics effects associated with the construction, existence and operation of the Proposed Development. Mitigation measures that would be implemented to reduce the effect of the Proposed Development on socio-economics are also considered, where relevant.

15.2 Scope of the assessment

15.2.1 The proposed scope for the assessment of socio-economics is summarised in Table 52.

Table 52: Socio-economic assessment scope

Assessment	Construction	Existence	Operation
Employment	×	✓	✓
Housing	n/a	×	✓
Social Infrastructure	n/a	×	✓
Community Cohesion	×	n/a	✓

15.2.2 In summary, construction effects are fully scoped out of the socio-economics assessment. Therefore, the assessment is limited to existence and operation effects only. It should be noted that this differs from the scope of assessment originally set out in the Scoping Report which included the assessment of community cohesion at the construction phase and housing and social infrastructure at the existence phase. Justification for the change in scope is provided below.

Construction – community cohesion

15.2.3 Due to the phased nature of development, and assuming a ‘worst-case’, existing and new residents and businesses will be present at different stages during the construction. The draft Construction Management Plan (CMP) (EBR-14) has been produced to align with Westminster City Council’s (WCC) Code of Construction Practice (CoCP) which aims to ensure continued access for these receptors, as well as mitigate any likely residual significant adverse effects (including noise/vibration, air quality, and HGV movements) experienced by them. As such, further assessment of community cohesion at the construction phase is not required through the socio-economic chapter.

15.2.4 It should be noted that the assessment of **employment** at the construction phase is scoped out of the assessment based on low potential to be significant, which is consistent with the Scoping Report.

Existence – housing and social infrastructure

15.2.5 In order to assess the likely significant effects on residential receptors in terms of housing and social infrastructure provision, it is judged to be most appropriate to undertake the assessment for the operation phase.

Scoping review

The following changes to the scope of the socio-economic assessment resulted from a draft review of the EIA Scoping Report in October 2019:

- further justification was provided with regards to construction employment being scoped out;
- it was noted that the effects of the displacement of existing residents would also be considered as part of the assessment;
- it was noted that an assessment of the effects of the Proposed Development on social infrastructure and on crime would be considered as part of the chapter;
- it was agreed that school capacity data from the Department of Education would be reviewed. However, following review, it was considered that data sourced from Westminster City Council and Ofsted was the most up to date;
- it was noted that the geographies chosen for assessment of different baseline sub-topics, the key receptors and their sensitivity would be clearly justified; and
- it was agreed that engagement with school planning officers at Westminster City Council and the NHS Central London Clinical Commissioning Group (CCG) should be undertaken. Details of this engagement is provided in Section 1.3 below.

Formal Scoping Opinion

15.2.6 A formal Scoping Opinion was received from Westminster City Council on 6 December 2019. This included one comment relating to socio-economics from the Metropolitan Police (Designing Out Crime Officer). In response to this, crime prevention and community safety have been considered as part of the operational community cohesion assessment in this chapter.

15.3 Consultation

15.3.1 A meeting was held with contacts from North West London CCG and NHS London Healthy Urban Development Unit (HUDU)) on 13th January 2020 to discuss the scope of the socio-economic assessment and obtain further local context. This is considered in further detail in Appendix L1.

15.3.2 Officers at Westminster City Council were contacted to discuss school place planning. In response, WCC's Growth, Planning and Housing team shared the Westminster School Organisation and Investment Strategy 2018 (with 2019-2020 update). This document has informed the Social Infrastructure – Education – baseline which can be found in paragraph 1.6.27 onwards.

15.4 Methodology

Overview

15.4.1 This section outlines the methodology for assessing the likely significant effects on socio-economics from the existence and operation of the Proposed Development. Construction effects have been fully scoped out of the socio-economics assessment for the reasons set out in sections 15.2.3 and 15.2.4.

Baseline methodology

Receptors

15.4.2 Receptor identification is based on baseline data conditions. Receptor inclusion and appraisal of receptor sensitivity uses professional judgement and previous experience. The key receptors, together with the relevant assessments, are set out in Table 53.

15.4.3 The geographies chosen for assessment of different baseline sub-topics are flexible and reflect the characteristics of each receptor, as summarised in Table 53. Baseline data has been collected from a range of geographies to inform these assessments, including at Lower Layer Super Output Area (LSOA), ward level (Churchill Ward), borough (City of Westminster) and London level, with a full list provided in Appendix L1.

Table 53: Geographies for assessment

Sub-topic	Geography for assessment	Justification
Existence employment effects	Local community	Local community is defined here by the application site and existing surrounding residential area (refer to Figure 1). This scale is appropriate given the assumption that the retail units mainly serve the local area, rather than a wider catchment.
Operational employment effects	Local community, pan-borough (City of Westminster, Royal Borough of Kensington and Chelsea and London Borough of Wandsworth), and London	Local community is defined here by the application site and existing surrounding residential area (refer to Figure 1). This range of scales (including pan-borough and London – refer to Figures 2 and 3) is considered appropriate, assuming that uptake for future on-site employment and residential units may be localised but is also is likely to extend to residents living across the wider London catchment area.
Operational housing effects		
Operational social infrastructure and community cohesion effects	Wider community	Wider community is defined here by the application site and up to a 3-mile radius around the centre point of the site (refer to Figure 2). This scale is appropriate given the range of distances individuals are prepared to travel for social infrastructure and the networked nature of communities.

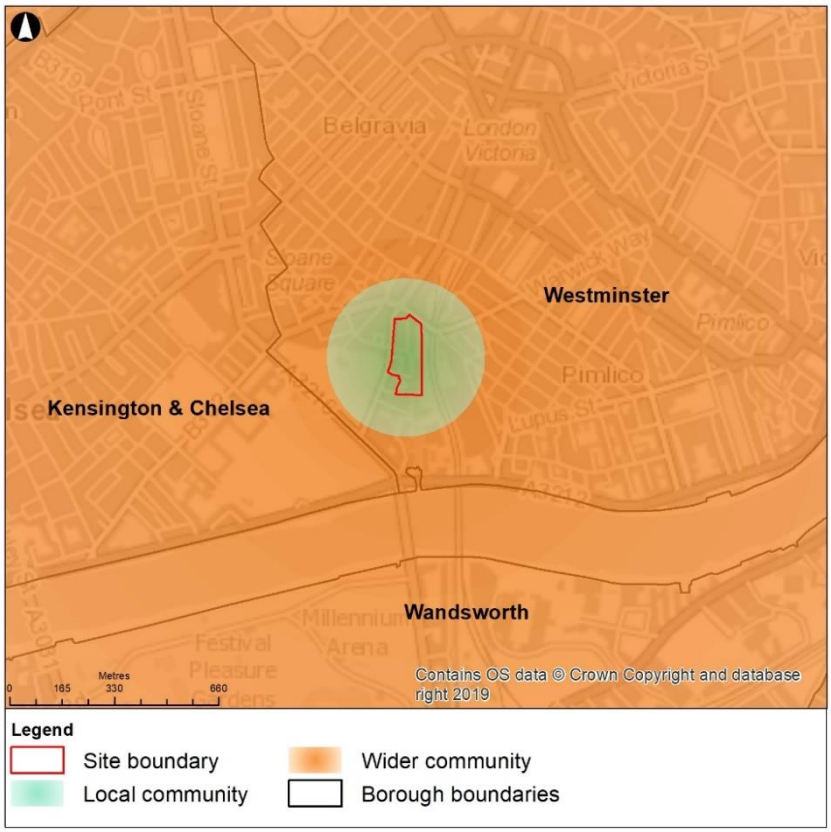

Figure 22: Assessment area: local community

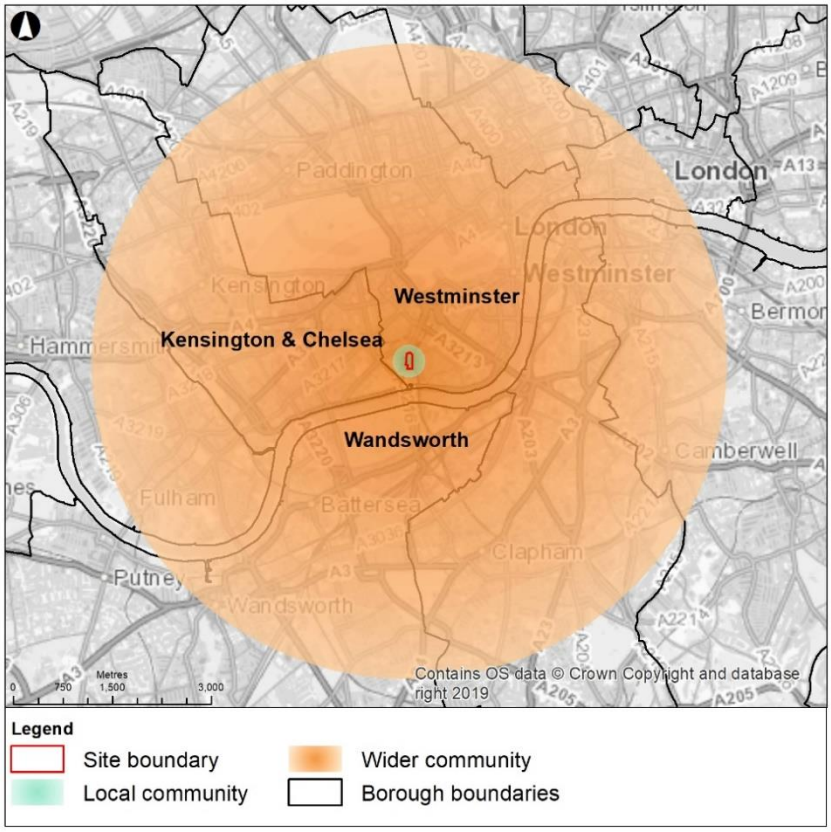

Figure 23: Assessment area: wider community

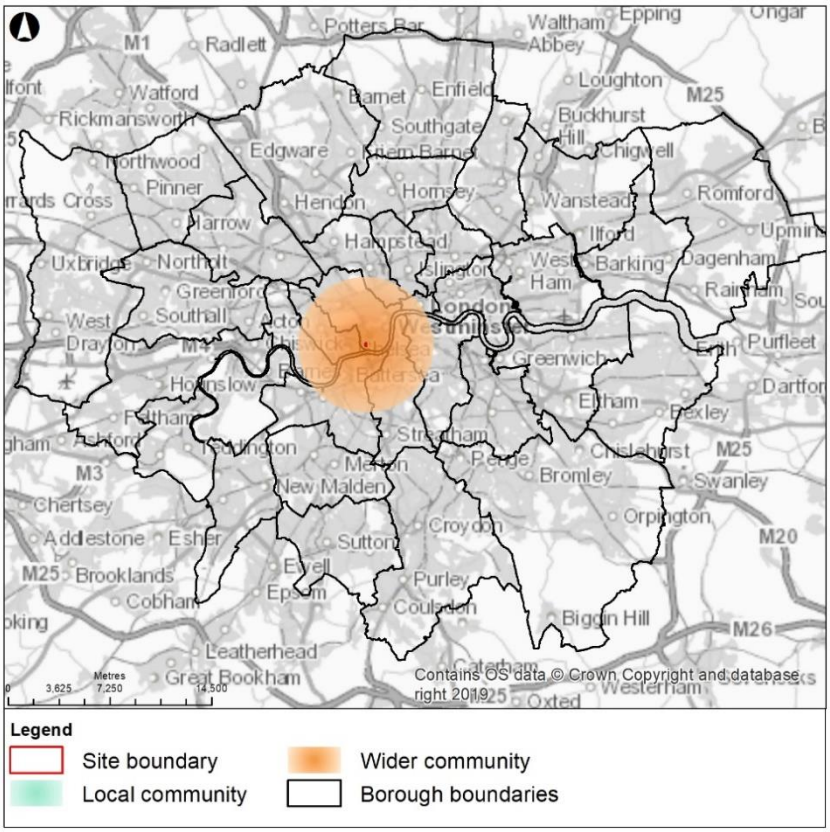

Figure 24: Assessment area: London

Existence effects

15.4.4 For existence purposes, the assessment year is 2028 (year by which the development is fully built-out).

Employment – existing businesses located within the site

15.4.5 To assess the existence effects of the Proposed Development, a qualitative assessment of the potential disruption and cost imposed on existing businesses (see Appendix L1) located on the application site is undertaken. Additionally, the qualitative and quantitative impact of the displacement of the current businesses on local character has been considered.

Operational effects

15.4.6 For operational assessment purposes, the assessment year is 2028 (when the Proposed Development is expected to be fully operational).

Employment – current and future residents living in the City of Westminster and London

15.4.7 An assessment of operational employment effects on current and future residents is based on the proposed quantum and type of employment-generating uses, occupational and skills profile of existing residents and the new residential population. The assessment takes into account baseline conditions, published best

practice and guidance on calculating employment densities and additionality, detailed in Appendix L1 and L2.

Housing –returning residents of the existing estate, current and future residents living in the City of Westminster and London

15.4.8 The assessment of effects on housing considers change in the level and type of provision and the suitability of provision to meet the needs of the existing and future community.

Social infrastructure – returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development

15.4.9 A qualitative assessment of operational effects is undertaken with regard to the adequacy of provision of education, healthcare and other community facilities, as well as play space and open space. This is based on the proposed number of residential units, baseline conditions in terms of existing social infrastructure provision, published best practice and guidance and professional judgement (detailed in Appendix L1 and L2).

Community cohesion – returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development

15.4.10 Community cohesion refers to the way in which communities, or people in a community, bind, associate or interact together, creating a shared sense of identity and promoting local resilience. Westminster's Draft City Plan 2019-2040[108] Policy 35 states that community infrastructure and facilities are integral to supporting people's everyday lives being used by residents, workers and visitors, and are a vital resource to support successful places and communities.

15.4.11 To establish changes to community cohesion which may result through operation of the Proposed Development, the presence of existing retail and community uses (see Appendix L1) within premises in the application site is established. A qualitative assessment of the loss of these facilities on existing neighbourhood residents is undertaken, taking into account the extent to which they provide specialist services and thus whether they are likely to serve a large proportion of the existing local community.

15.4.12 Baseline conditions relating to employment, social infrastructure and crime levels are then drawn upon as part of a qualitative assessment of how the Proposed Development may impact on community cohesion.

Cumulative effects

15.4.13 The list of developments identified for assessing cumulative effects is presented in Appendix A5. The potential for cumulative effects with each of these

[108] City of Westminster, 2019. *City Plan 2019-2040 – Regulation 19 Publication Draft (June 2019)*. Available at: https://www.westminster.gov.uk/sites/default/files/core_001_regulation_19_publication_draft_city_plan_2019-2040_wcc_june_2019.pdf

developments is examined, and an assessment based on professional judgement presented.

15.5 Baseline

15.5.1 The following section presents the existing socio-economic conditions, with further details regarding the methodology for deriving the baseline provided in Appendix L1.

Population

15.5.2 According to the 2017 mid-year estimate, the population of the City of Westminster was 244,813[109]. The population is projected to increase by 32,631[110] by 2042, an increase of 13.3%. This projected growth is lower than the projected growth in London as a whole (19.1%) (Appendix L2). The projected increase is an important consideration for the requirements for delivery of new housing.

Deprivation

15.5.3 The 2019 English Index of Multiple Deprivation (IMD)[111] is measured at the Lower Layer Super Output Area (LSOA) level, and is based upon seven deprivation domains: health, income, employment, education, exposure to crime, barriers to housing and services and living environment. The Health assessment (Section 12) summarises the deprivation levels for each LSOA covering the local and wider community[112]. Notably, the Health chapter reports that the local community (comprising LSOAs Westminster 023C and Westminster 023G), faces significant income and employment deprivation, ranking between the top 10% and 30% most deprived in the country.

Economic activity

15.5.4 The latest population estimate shows that the proportion of economically active residents (aged 16-64 years) in the local area (Churchill Ward) is 70.3% and in the City of Westminster is 71.8%, which is lower that the London average (78.1%).

Employment

Sectoral employment

15.5.5 The 2018 Business Register and Employment Survey data[113] indicates that the professional, scientific and technical; accommodation and food services; and

[109] ONS, 2017. *Mid-year population estimates.* Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates
[110] GLA, 2017. *Trend-based population estimates: Long-term*. Available at: https://data.london.gov.uk/dataset/trend-based-population-projections
[111] ONS, 2019. *Indices of Deprivation 2019 and 2015*. Available at: https://dclgapps.communities.gov.uk/imd/idmap.html
[112] Study areas defined in Health chapter
[113] ONS, 2019. *2018 Business Register and Employment Survey (BRES).* Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/businessregisterandemploymentsurveybresprovisionalresults/2018#business-register-and-employment-survey-data

retail[114] sectors are key employment sectors for the City of Westminster residents, with 16.9%, 13.0% and 10.6% of the Borough's population working in these areas respectively (Appendix L2).

15.5.6 At the more local level (Churchill Ward), there is a high proportion of residents working in transport and storage (17.1%); public administration and defence (14.3%); accommodation and food services (12.9%); and retail[115] sectors (11.5%)[116].

15.5.7 The proportion of City of Westminster residents working in higher skilled occupations[117] is higher than the London average (58.7%), at 74.7%.[118]

Current on-site employment-generating uses

15.5.8 An estimation has been made regarding the baseline quantum of employment supported by existing employment-generating uses across the application site. This was based on both the number/size of existing employment sites (mainly retail units) and the occupancy of those sites.

15.5.9 The application site currently accommodates a mix of employment-generating uses, including:

- Class A1 shop floorspace;
- Class A2 financial and professional services floorspace;
- Class A3 restaurant and café floorspace; and
- Vacant units.

15.5.10 It is estimated that the aforementioned onsite employment-generating uses (excluding the vacant units) support an estimated 39 direct full-time equivalent (FTE) (Appendix L2).

Housing

Housing size

15.5.11 There is an average of 2.0 persons per household in the City of Westminster, which is lower than the average for London as a whole (2.5)[119].

15.5.12 In 2011, the majority of households in the City of Westminster comprised one person households (52.7%), 41% were families (of which 42% had dependent children and 22% were lone parents), and 20% were living as a couple (married, civil partnership or cohabitating). At the Churchill Ward level, the majority of

[114] Includes motor trades, wholesale and retail
[115] Includes motor trades, wholesale and retail
[116] ONS, 2019. *2018 Business Register and Employment Survey (BRES).* Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/businessregisterandemploymentsurveybresprovisionalresults/2018#business-register-and-employment-survey-data
[117] Calculated based on percentage of employees working in the following occupation groups: managers, directors and senior officials; professional occupations; and, associate professional and technical occupations, as set out in Appendix L2
[118] ONS, 2018. *Nomis Labour Market Profile – Westminster – Employment by occupation (Oct 2018 – Sep 2019).* Available at: https://www.nomisweb.co.uk/reports/lmp/la/1946157259/report.aspx#tabempocc
[119] ONS, 2011. *Household Size*. Available at: https://www.nomisweb.co.uk/census/2011

households also comprised one person, although a slightly higher proportion (43%) were families compared to the City of Westminster as a whole (of which 50% had dependent children and 33% were lone parents), and 15% were living as a couple (married, civil partnership or cohabiting) [120].

15.5.13 In 2011, the occupancy rating in the City of Westminster suggested that overall 11% of households were overcrowded, while at the Churchill Ward level the proportion was fractionally higher at 12%[121].

Home ownership

15.5.14 Based on the 2011 census, 34,721 people whose main home is located in the City of Westminster have a second address elsewhere in the UK or abroad, this represents 16% of all residents. This is higher than the London average of 6%[122].

15.5.15 The number of households in temporary accommodation in the City of Westminster has increased steadily in recent years, from 2,372 in December 2014 to 2,521 in March 2018. As of March 2018, the City of Westminster had 20.73 households in temporary accommodation per 1,000 households, compared to 15.18 per 1,000 households across London[123].

15.5.16 The proportion of homes that are owned (both outright and with a mortgage) in the City of Westminster is 31%[124]. This is significantly lower than the average across London (48%) and England as a whole (64%)[125].

Housing targets

15.5.17 The quantum of housing need for both affordable and market dwellings at the borough and London scales and nature of housing need in terms of dwelling size by bedrooms is an important consideration for the operational impact of the Proposed Development on those in need of housing at the borough and London scales. The baseline conditions are set out in full detail in Appendix L2.

Social infrastructure

Healthcare

15.5.18 With respect to healthcare facilities, there are currently nine GP surgeries located within a one-mile radius of the Proposed Development, six of which are located within City of Westminster, two in Royal Borough of Kensington and Chelsea

[120] City of Westminster, 2018. *City of Westminster Profile 2018.* Available at: https://www.westminster.gov.uk/sites/default/files/city_profile.pdf
[121] ONS, 2011. *Occupancy Rating (bedrooms)*. Available at: https://www.nomisweb.co.uk/census/2011
[122] ONS, 2011. Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/2011censuskeystatisticsforenglandandwales/2012-12-11
[123] MHCLG, 2018. *Households in temporary accommodation, England, District.* Available at: https://opendatacommunities.org/home
[124] City of Westminster, 2015. *Westminster Profile, 2015*. Available at: http://transact.westminster.gov.uk/docstores/publications_store/wardprofiles/Westminster-Profile-2015.pdf; and *City of Westminster Profile, 2018*. Available at: https://www.westminster.gov.uk/sites/default/files/city_profile.pdf
https://www.westminster.gov.uk/sites/default/files/city_profile.pdf
[125] Westminster City Profile, 2015. Available at: http://transact.westminster.gov.uk/docstores/publications_store/wardprofiles/Westminster-Profile-2015.pdf

and one in London Borough Wandsworth. All of these are currently listed as accepting new patients[126]. These are listed in full in Appendix L2.

15.5.19 A total of 91,067 patients are registered across these surgeries, which collectively provide 50 GPs, equating to a current GP-patient ratio of 1:1,821 and indicating a modest excess of 21 patients for every GP[127]

Education

15.5.20 The Proposed Development is located within the City of Westminster but is near the boundaries with Royal Borough of Kensington and Chelsea and London Borough of Wandsworth.

Early years provision

15.5.21 Westminster City Council's School Organisation and Investment Strategy 2018 (with 2019-2020 update)[128] states that numbers of 3-4 year olds in Westminster has decreased in recent years and concludes that there is sufficient provision of early years facilities within Westminster.

15.5.22 However, it is acknowledged that the locational choices made by different families will also take into account a range of factors, including proximity to places of work and siblings' schools, for example, and will transcend borough boundaries. Early years provision comprises an array of maintained, private, voluntary and independent setting offering a range of services, both full time and sessional, to suit the needs of different families. A number of primary schools[129] and places of work (for example House of Commons)[130] also offer nursery places.

15.5.23 For the purposes of the baseline assessment, the search area is focussed on a two-mile radius of the Proposed Development. There are 79 Ofsted-registered early years facilities providing full day care within a two-mile radius of the Proposed Development[131] (Appendix L2), located within City of Westminster, London Borough of Lambeth, Royal Borough of Kensington and Chelsea, and London Borough of Wandsworth. Across these facilities there appears to be an overall surplus of 74 places compared with capacity[132].

Primary school provision

15.5.24 Westminster City Council's School Organisation and Investment Strategy 2018 (with 2019-2020 update)[128] states that there is a current and projected surplus of primary school places in Westminster. In the long term, a predicted 20% plus surplus of primary school places means that some schools may not be financially viable, and action has been taken to reduce the significant surplus of places,

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[126] As of December 2019
[127] Based on required provision of 1 GP to every 1,800 people, as set out in the Methodology.
[128] Westminster City Council, 2018. *School Organisation and Investment Strategy 2018*. Available at: https://www.westminster.gov.uk/school-organisation-place-planning; Westminster City Council School Organisation and Investment Strategy 2019-2020 Update (Appendix A). Available at: unknown.
[129] These places have not been included in the overall assessment as the Ofsted data does not disaggregate the split of pupil numbers for the nursery and primary schools.
[130] These places have not been included in the overall assessment as it assumed that only children of employees would be eligible to attend.
[131] Ofsted. *Find an inspection report.* Available at: https://reports.ofsted.gov.uk/
[132] As of December 2019.

including school closures and re-organisation/ mergers and more informal admission caps. However, the Strategy acknowledges that as the Council seeks to provide further homes, especially affordable homes, the need for school places will emerge.

15.5.25 It is acknowledged that Westminster residents may not attend primary schools within the borough and instead may travel further to attend a preferred school. Therefore, for the purposes of the baseline assessment, the search area is focussed on a two-mile radius of the Proposed Development. There are a total of 58 primary schools within this area, (Appendix L2); 13 of which are located within City of Westminster; 19 are located in London Borough of Lambeth; 11 are located in Royal Borough of Kensington and Chelsea; 11 are located in London Borough of Wandsworth; and 4 are located in London Borough of Southwark.

15.5.26 Across these schools there is currently an estimated surplus of 1,949 primary school places compared with capacity[133]. In cases where the number of pupils on roll is significantly lower than capacity, this is likely the result of new or recently expanded schools 'coming onstream' a year group at a time until they reach their designed capacities (which are assumed to be built on forecast demand). This estimated surplus is therefore likely to be an overestimation of the actual number of primary school places available.

Secondary school provision

15.5.27 Westminster City Council's School Organisation and Investment Strategy 2018 (with 2019-2020 update)[128] states that in the secondary sector, there is no spare capacity at present and that the GLA projections indicate that further capacity will be required from 2020 after taking account of the school expansion programme currently underway. Furthermore, these projections do not allow for future housing developments which are not yet approved.

15.5.28 The Strategy acknowledges that at secondary level, students are more willing to travel further in order to attend a preferred school. Furthermore, secondary schools in Westminster are very popular with non-borough residents who currently make up approximately 46% of the secondary cohort. To take account of secondary schools beyond the Westminster borough boundary and the assumption that secondary school pupils are more able to travel further distances to school than primary school pupils, the search area is focussed on a three-mile radius of the Proposed Development.

15.5.29 There are 14 secondary schools[134] within a three-mile radius of the Proposed Development, nine of which also have sixth form provision[135] (Appendix L2). Across these schools there is currently an identified surplus of 426 secondary school places compared with capacity[136]. However, this figure could be an overestimation of the actual number of secondary school places available on the basis that new or recently expanded schools may be in the process of 'coming onstream' a year group at a time until they reach their designed capacity.

[133] As of March 2020.
[134] This figure does not include independent schools or schools providing for specialist education needs.
[135] UK Government. *Find and Compare Schools in England*. Available at: https://www.gov.uk/school-performance-tables
[136] As of March 2020.

Furthermore, in the case of through schools with combined secondary and sixth form provision, the data for capacity and number of pupils on roll is generally not disaggregated, making it challenging to identify any detail on within which key stages or year groups a surplus or deficit might fall.[137]

Community facilities

15.5.30 The baseline assumes a combined total of 177 sqm community floorspace within the existing development site which includes a building dedicated to community gardening (23 sqm). The remaining 154 sqm comprises community space in the basement of Edgson House which has now been demolished; however this facility has been included for the purposes of the socio-economic assessment to ensure the full effects are properly assessed.

15.5.31 Notwithstanding this it should also be noted that a separate planning application has been approved for meanwhile uses for a period of 5 years at the former site of Edgson House. This development will comprise community space (Class D1), café (Class a A3) and workspace/retail units (Class A1 and/or Class B1) with associated landscaping and temporary structures. Construction began on site in February 2020...

15.5.32 With regards to the wider Westminster context, the Draft Infrastructure Delivery Plan (IDP) (November 2019)[138] provides a high-level analysis of existing and future provision of social infrastructure, including community centres, children's centres and family hubs, and youth clubs. Figure 2 shows youth clubs, children's centres and family hubs within the vicinity of the development site. Further work has been undertaken as part of the socio-economic assessment which illustrates that there is a range of existing community facilities within a two-mile radius of the Proposed Development, providing a host of spaces and resources for community and voluntary groups, charities, arts groups, religious groups, youth clubs and private functions (Appendix L2). In comparing the results of this detailed local search against the borough-wide map in the draft IDP, the provision of existing community facilities within the vicinity of the development site would appear typical (neither under or over the average) compared to provision across the City of Westminster. Given the range of choice, it is considered that the baseline provision of community facilities is adequate.

Play space

15.5.33 Within the existing development site there is a playground set within the community gardens and a multi-use games area (MUGA), comprising a total of 1,836 sqm. The development site is located in an identified area of Play Space Deficiency (see Figure 6 of the Draft Infrastructure Delivery Plan (IDP) (November 2019)[138]).

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[137] Given these challenges, the surplus or deficit recorded at these combined schools has assumed to be neutral (with the exception of those secondary schools falling within City of Westminster where disaggregated data has been sourced from the Westminster City Council (2018) Schools Organisation and Investment Strategy.)

[138] City of Westminster, 2019. *City Plan 2019-2040 – Draft Infrastructure Delivery Plan (November 2019 – Live document)*. Available at https://www.westminster.gov.uk/sites/default/files/ev_gen_007_draft_infrastructure_delivery_plan_wcc_november_2019.pdf

Open Space

15.5.34 Westminster has over 200 identified parks and open spaces across the city, ranging from larger multi-functional areas such as Paddington Recreation Ground to small ornamental gardens, squares and 'pocket parks'[139]. The majority of these spaces offer free access to the public, meaning Westminster is able to provide more than the national average of publicly available open space, with 2.17 hectares per 1,000 resident population[140]. Westminster's Draft City Plan 2019 – 2040[138] states that despite the number of high quality open spaces there is still an overall deficiency in the city.

15.5.35 Within the existing development site, a total of 13,500 sqm of outdoor space has been calculated that, not comprising built form, is publicly accessible. Whilst this comprises 1,836 sqm play space in addition to other areas of open amenity, the majority consists of roads, alleyways, verges, courtyards, fenced off planting and "left over space" between blocks. These spaces, whilst "open" and in some cases grassed and treed, are otherwise poorly defined and serve limited levels of usability and biodiversity value. Figure 6 of the Draft Infrastructure Delivery Plan (IDP) (November 2019) [138]) does not identify the development site as an area of open space deficiency.

Community cohesion

15.5.36 There are existing community facilities and landscaped areas within the estate which encourage social interaction and thereby contribute to community cohesion.

15.5.37 The latest statistics from the Metropolitan Police[141] reveal that between January 2018 and January 2020 there were 1,464 recorded crimes in the Churchill Safer Neighbourhood. For this period, the crime rate per 1,000 residents was on average 131 crimes. Churchill crime count is relatively low compared to surrounding Safe Neighbourhood areas which have crime counts ranging from 1,258 (Tachbrook Safer Neighbourhood area) – 6,524 (Brompton and Hans Town Safer Neighbourhood area).

15.5.38 Over the last 24 months the most prevalent type of crime in the Churchill Safer Neighbourhood has been 'Violence Against the Person' with 481 recorded crimes[142]. The second most prevalent type of crime in the area has been 'Theft' with 281 recorded crimes.[143] Over the last 24 months the number of crimes

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[139] City of Westminster, 2019. *A Partnership Approach to Open Spaces and Biodiversity in Westminster (March 2019)*. Available at: https://www.westminster.gov.uk/sites/default/files/a_partnership_approach_to_open_spaces_and_biodiversity_in_westminster_-_march_2019.pdf

[140] City of Westminster, 2018. *Greener City Action Plan 2015-2025 (Year 3 Update October 2018)*. Available at: https://www.westminster.gov.uk/sites/default/files/greener_city_action_plan_2015-2025_year_3_update_-_october_2018.pdf

[141] Metropolitan Police. *Crime data dashboard*. Available at: https://www.met.police.uk/sd/stats-and-data/met/crime-data-dashboard/

[142] This type of crime includes a range of offences from those classified as minor such as harassment and common assault, to those classified as serious offences such as murder, actual bodily harm and grievous bodily harm.

[143] This type of crime includes a range of offences including those classified as theft from a person, motor vehicle, residential or non-residential property.

committed has remained fairly stable, falling within the region of 45 – 75 recorded crimes per month.

Future baseline

15.5.39 This refers to the projected baseline in 2028, if no development were to take place. This includes the demolition of the six buildings under the Prior Approval (Wellesley, Wainwright, Hillersdon, Dalton, Mercer and Pimlico Houses).

15.5.40 The existing retail floorspace recorded at the baseline year is located in Rye House and Bucknill House. Whilst these buildings are not included in the Prior Approval application, it is likely that the level of employment floorspace may be lower at the future baseline year as business owners may choose to relocate with a reduction of residents in the estate.

15.5.41 Without the new development, the ongoing decant of residents to facilitate the demolition will result in many units becoming empty and potentially subject to anti-social behaviour, resulting in a potential increase in crime levels within the Churchill Safer Neighbourhood area. The demolition of these buildings may further affect community cohesion for those residents remaining within the estate as those existing landscaped areas which encourage social interaction would be impacted.

15.5.42 Since it is not known where the decanted residents of the six buildings would be re-housed, it is not possible to conclude whether the capacity of existing social infrastructure assessed at the baseline year would be affected.

Receptors

15.5.43 The key receptors to be considered in the assessment are set out

Table 54: Receptors relevant to the socio-economics assessment

Assessment	Receptor	Sensitivity	Justification for inclusion in the assessment	Justification for sensitivity rating
Existence: employment	Existing businesses located within the site	Medium	To identify the effects of displacement on existing businesses within the site.	The businesses on site are not considered to have particularly strong locational ties and are thus likely to be able to find suitable alternative accommodation.
Operation employment	Current and future residents living in City of Westminster and London	Medium	To identify the 'net change' in onsite employment, covering both numbers and types of jobs compared to the existing onsite employment.	The City of Westminster and London presents a range of alternative employment opportunities for current and future residents.
Operation housing	Returning residents of the existing estate, current and future residents living in City	High	To assess the adequacy of new housing units to meet the needs of returning residents and future residents living in City of Westminster and London.	Returning residents have specific housing needs which need to be accommodated in the Proposed Development. High level of identified housing need, particularly in relation to family sized

Assessment	Receptor	Sensitivity	Justification for inclusion in the assessment	Justification for sensitivity rating
	of Westminster and London			dwellings and recent under-delivery of housing in context of Local Plan housing targets.
Operation social infrastructure	Returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development	Low-High	To assess the adequacy of new social infrastructure to meet the needs of returning residents, existing neighbourhood residents, and future residents of the Proposed Development.	Variable sensitivity dependent on adequacy of existing provision.
Operation community cohesion	Returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development	Low-High	To assess the provision of new employment uses, housing and social infrastructure on community cohesion.	Variable sensitivity dependent on occupancy of completed development, nature of development, nature of employment opportunities and location and quality of associated infrastructure provision (to be confirmed through the assessment).

15.6 Embedded and good practice measures

15.6.1 The Proposed Development provides for the following upon completion:

- up to 55 % affordable housing of different sizes;
- up to 9,515 sqm of publicly accessible open space;
- at least 2,854 sqm of formal and informal play space provision; and
- up to 1,218 sqm of social infrastructure (Use Class D1 and/or D2) including a dedicated community hall space (158 sqm).

15.6.2 These elements of the Proposed Development provide key embedded mitigation, to help ensure that the impact of the Development (in terms of population increase) does not result in increased pressure on existing facilities and a worsening of the baseline conditions for existing residents.

15.7 Assessment

Existence effects

Employment – existing businesses located within the site

15.7.1 The Proposed Development will involve the phased clearance of existing employment floorspace (Appendix L2). If existing businesses decide to continue on-site operation, they will be required to relocate to other premises prior to construction, which will likely be disruptive to their functioning and incur costs.

Those occupiers are aware of the immediacy of the Proposed Development and it is noted that some existing retail units are currently vacant, suggesting the site has started to 'ramp down', allowing for reduced disruption over a reasonable timeframe.

15.7.2 The completed Ebury Estate Masterplan area will comprise 3,018 sqm of non-residential commercial floorspace. This compares to 846 sqm of non-residential commercial floorspace in the existing estate.

15.7.3 The Proposed Development will provide accommodation for Classes A1- A4, B1, D1 and D2 uses and will support employment once operational. Employment generated by the Proposed Development is covered in paragraph 15.7.7.

15.7.4 The proposed retail strategy for the Ebury Bridge renewal allows for an enhanced and diversified retail offer for residents and the surrounding Ebury Bridge community. All longstanding businesses have been offered a right of first refusal for a new unit on the renewed estate, subject to a set of criteria being satisfied. A range of supportive measures has been rolled out by the Council, with a commitment to provide opportunity for existing businesses to transition to the newly developed estate[144].

15.7.5 Where businesses are not in a position to relocate into the renewed estate, they are likely to be able to find suitable alternative accommodation. Given the nature of the existing businesses uses, they are not considered to have specific locational requirements.

15.7.6 The impact of the Proposed Development is also judged to be of medium magnitude and permanent. This is on the basis that some existing businesses will relocate into the renewed estate and some will not be in a position to do so. However, those displaced businesses are likely to be able to find alternative premises. The Proposed Development will result in an increased quantum of commercial floorspace and introduction of new uses which, overall, is considered to result in only a minor change to the site's character and functioning. Given the medium sensitivity of the existing businesses, this would produce a permanent minor adverse socio-economic effect which is **not significant**.

Operational effects

Employment - current and future residents living in City of Westminster and London

15.7.7 The Proposed Development allows for some flexibility around the potential split between the different employment generating uses (Appendix L1) which would each result in different net employment effects. For the purposes of this assessment, Appendix L1 provides details on how a maximum employment scenario (comprising a floorspace mix with the highest employment density) and a minimum employment scenario (comprising a floorspace mix with the lowest employment density) have been decided – Scenario 1 and Scenario 2 respectively.

[144] For full details refer to Ebury Bridge Renewal: Estate Regeneration Statement

Table 55: Proposed non-residential floorspace schedule

Block	Uses GIA
B1, B2, B3, B4	1,600 sq m Class A1 - A4 / D1 where: -A3 no more than 460 sq m -A4 no more than 340 sq m -D1 no more than 150 sq m
B5	350 sq m Class B1 158 sq m Class D1
B9	910 sq m Class D1 / D2 / A3 where: -A3 no more than 130 sq m

15.7.8 Based on Scenarios 1 and 2, the Proposed Development will likely support between 101 – 107 gross full-time equivalent (FTE) jobs at the London scale. The Proposed Development will support approximately 96 – 103 net additional FTE jobs at the London scale, of which some 32 – 34 are indirect and induced jobs. It is estimated 49 – 53 net additional FTE jobs will be supported at the pan-borough scale, of which around 11 – 12 are indirect and induced jobs (Appendix L2).

15.7.9 Both Scenarios 1 and 2 are therefore likely to result in new employment opportunities for existing and future residents at the local community, pan-borough (City of Westminster, Royal Borough of Kensington and Chelsea, London Borough of Wandsworth) and London levels; which could be particularly beneficial in the context of the existing significant income and employment deprivation within the vicinity of the application site (refer to paragraph 15.5.3).

15.7.10 Scenarios 1 and 2 are similar in terms of the quantum of retail and office-based employment floorspace. There are only minor differences with regards to the proportion of floorspace in Class D1 and D2 uses. Whichever scenario is carried forward, it represents a predominantly retail-led employment offer.

15.7.11 Across all sectors, retail represents one of the key sectors that residents of Churchill Ward, City of Westminster and London are employed in, as shown in Appendix L2. Given this existing employment profile, new employment opportunities are likely to be equally accessible to and beneficial for residents living in the local community (including within the Churchill Ward), City of Westminster and the wider London area.

15.7.12 The sensitivity of current and future residents living in City of Westminster and London is medium. Since the impact is small/medium and permanent, this produces a permanent minor beneficial effect which is **not significant**.

Housing - returning residents of the existing estate, current and future residents living in City of Westminster and London

15.7.13 Upon completion, the Proposed Development will deliver a total of 758 residential dwellings of varying size and tenure, which will be built to meet or exceed the minimum space standards identified in the adopted London Plan[145]

[145] Mayor of London, 2016. *The London Plan - Table 3.3.* Available at: https://www.london.gov.uk/what-we-do/planning/london-plan/current-london-plan/london-plan-2016-pdf

and emerging draft London Plan[146]. This compares to the 336 units in the existing estate, thereby representing a net uplift of 422 units.

15.7.14 An indicative delivery of 51% affordable housing units across the Masterplan area is proposed, which aligns with the Intend to Publish London Plan affordability target and exceeds the boroughwide target of 35% (Appendix L2). All existing social rent and private units will be replaced as part of the scheme; and there will be an uplift of 102 social rent and 234 private units, with the provision of an additional 86 intermediate (rent/ ownership) units. Furthermore, the scheme will deliver 20.2% family sized units across the whole masterplan. Whilst this falls below the 25% target set out in Westminster's Draft City Plan 2019 – 2040[147], it does represent a 22% uplift compared to the existing

15.7.15 Replacement social rent and private units, as well as new intermediate units will be provided at Phase 1 to meet the specific housing needs of all secure tenants and resident leaseholders wishing to return to the new estate, including those who have stayed on the site or returned if they have already opted to move temporarily off site. The phases of the development are set out in Parameter Plan Ref: EBE-AST-XX-XX-DR-A-011102.

15.7.16 Current and future residents living in Westminster and London have an identified high level of housing need as set out in the baseline, particularly in relation to family sized dwellings.

15.7.17 Overall, the sensitivity of returning residents of the existing estate, current and future residents living in City of Westminster and London is high. The baseline also indicates existing issues regarding overcrowding in existing housing stock. Therefore, all net additional housing units to be delivered in the Proposed Development will represent additional housing units available to these residents with a greater proportion of family sized units; all of which will meet the required dwelling size standards. The Proposed Development is considered to result in a permanent medium impact, resulting in a permanent moderate beneficial effect which is **significant beneficial**.

Social infrastructure - returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development

Health care

15.7.18 In order to produce a robust assessment, a 'worst case scenario' has been assumed where all residents of the new housing provision are additional. This is likely to be an over-estimate as some will be relocated, and this 'worst case' approach also takes account of the situation before the 'baseline' (site part-clearance) where the site was occupied to a greater extent than currently.

[146] Mayor of London, 2019. *The London Plan – Intend to Publish version (December 2019) – Table 3.1.* Available at: https://www.london.gov.uk/what-we-do/planning/london-plan/new-london-plan/intend-publish-london-plan-2019

[147] City of Westminster, 2019. *City Plan 2019-2040 – Regulation 19 Publication Draft (June 2019)*. Available at https://www.westminster.gov.uk/sites/default/files/core_001_regulation_19_publication_draft_city_plan_2019-2040_wcc_june_2019.pdf

15.7.19 Existing local healthcare facilities are currently operating at close to the NHS target capacity and the additional 1,781 new residents of the Proposed Development will place additional demand upon local GP surgeries. Taking a further 'worst case scenario' in which all new residents register with a local GP, the additional residents would increase the overall practice list size to 1,857 patients per GP which would exceed the provision standard of 1,800 patients per GP, marginally worsening the existing level of service compared to baseline conditions. The result of these 'worst case scenarios' would drive the need for a single additional GP. The Proposed Development does not make specific provision for healthcare floorspace to accommodate the healthcare needs generated by new residents.

15.7.20 The sensitivity of receptors, in this case returning residents, existing neighbourhood residents and future residents of the Proposed Development seeking healthcare, would be high and the impact is judged to be of small magnitude and permanent (given there would be a marginal worsening of the existing patient to GP ratio and there are no healthcare facilities proposed as part of the development). This would produce a permanent minor adverse socio-economic effect which is **not significant**.

Education

15.7.21 The increase in the number of homes resulting from the Proposed Development, specifically the number of family homes, would increase the demand for primary, secondary (including sixth form) and early years' school places. Based on the number of children per age bracket, generated from the GLA population yield calculator, it is possible to estimate the number of pupils which would be generated by the Proposed Development. It is noted that these age brackets do not neatly fit school ages grouping but are felt to still provide a reasonable comparison or proxy across school types/levels. The Proposed Development would be estimated to yield 154 primary school pupils (aged between 5-11 years) and 80 secondary school pupils (aged between 12-15 years) and 42 children aged 16-17 years. In addition, an estimated 192 children aged between 0-4 years would generate need for early years places[148].

Early years

15.7.22 The Proposed Development includes flexibility to provide for up to 1,218 sqm of Class D1 floorspace, which could be occupied by a nursery. The baseline also indicates that given the existing choice in the market, there is assumed to be sufficient capacity to meet the needs of the returning and new population, whilst continue to serve the existing neighbourhood residents.

15.7.23 The sensitivity of the receptors to changes in availability of early years places would therefore be low and the impact of the Proposed Development is also judged to be of small magnitude and permanent (given there would not be undue pressure on existing early years providers during the operational phase of the

[148] As derived from the GLA Population Yield Calculator (updated 2019). This calculation has been based on a quantum of 758 new residential units.

development). This would produce a permanent neutral socio-economic effect which is **not significant.**

Primary level schools

15.7.24 The Proposed Development does not provide any new on-site primary school facilities. However, the baseline indicates a significant surplus of primary school places, although due to limitations of the data, it is suggested that this could be an overestimation of the actual baseline conditions. In determining the sensitivity of the receptors, the more specific locational needs of primary school pupils should also be considered; notably, the preference for a choice of schools which are easily accessible.

15.7.25 The sensitivity of the receptors to changes in availability of primary school places would therefore be high, though the magnitude of impact is judged to be small and permanent (given there would be an increase in demand for primary school places during the operational phase, although given the significant surplus in primary school places, this demand is not considered to place undue pressure on existing schools during the operational phase). This would produce a permanent minor adverse socio-economic effect which is **not significant**.

Secondary level schools

15.7.26 The Proposed Development does not include any additional secondary school provision. The baseline suggests an indicative surplus of secondary school places, though not as substantial as the surplus of primary school places. Furthermore, due to limitations in the data, it is considered that this could be an overestimation of the actual baseline conditions. In determining the sensitivity of the receptors, it should be noted that secondary school pupils tend to have capacity to travel further distances to school than primary school pupils.

15.7.27 The sensitivity of the receptors to changes in availability of secondary school places would therefore be low and the magnitude of impact is judged to be small and permanent (given there will be an increase in demand for secondary school places during the operational phase, although assumed to be distributed over a wider area). This would produce a permanent neutral socio-economic effect which is **not significant**

Community facilities

15.7.28 The flexible nature of the Proposed Development allows for the provision of up to 910 sqm Class D1/D2 use floorspace, and up to 308 sqm Class D1 use floorspace, which will include a dedicated community hall space (158 sqm). The occupancy of the remaining D1/ D2 floorspace is expected to be commercially driven and it is envisaged that future tenants could include a privately-run nursery or gym, for example.

15.7.29 The baseline indicates that there are a range of existing community facilities within a two-mile radius of the Proposed Development, providing an array of spaces and resources for community and voluntary groups, charities, arts groups, religious groups, youth clubs and private functions. The proposals also include 158 sqm dedicated community hall space to replace the 154 sqm hall originally located in Edgson House.

15.7.30 With regards to the interim effects on the early occupiers of the Detailed Area (blocks 7 and 8), the approved meanwhile use application at the former site of Edgson House provides temporary community space will be available for these receptors before the 158 sqm dedicated community hall space is completed.

15.7.31 The sensitivity of the receptors to changes in capacity of existing community facilities would be low and the impact small and permanent (given the existing choice in community facilities which would remain during the operational phase and would be provided as part of the Proposed Development). This would produce a permanent neutral socio-economic effect which is **not significant**.

Open space

15.7.32 The Westminster City Plan[149] does not set a benchmark standard of public space per resident. Rather, for sites not located in an area of open space deficiency, Draft Policy 35 states that major developments are required to provide new or improved public open space with applicants encouraged to improve accessibility and open space quality.

15.7.33 With regards to the interim effects on the early occupiers of the Detailed Area (blocks 7 and 8), Phase 1 includes a new public square providing some public space.

15.7.34 Upon completion, a total of 9,515 sqm of publicly accessible open space is proposed, compared to an existing 13,500 sqm. In this respect, the qualitative increase and wider usability of this 9,515 sqm exceeds that of the existing 13,500 sqm which, as noted above, whilst all publicly accessible, comprises a substantial provision of "leftover" space.

15.7.35 The sensitivity of the receptors to changes in open space provision is medium and the magnitude of the impact is medium and permanent (given there will be some increased pressure on existing open spaces during the operational phase, although the site is not identified as being within an area of open space deficiency). This would produce a permanent minor adverse socio-economic effect which is **not significant**.

Play space

15.7.36 With regards to the interim effects on the early occupiers of the Detailed Area (blocks 7 and 8), the approved meanwhile use application at the former site of Edgson House provides for the retention of some existing planting and play equipment. Furthermore, Phase 1of the Proposed Development includes some new playspace for 5-11 years.

15.7.37 Upon completion, it has been calculated that the proposal should provide at least 4,679 sqm of play space for children aged from 0 – 17 years[150]. The proposals

[149] City of Westminster – City Plan 2019-2040 – Regulation 19 Publication Draft (June 2019), available at https://www.westminster.gov.uk/sites/default/files/core_001_regulation_19_publication_draft_city_plan_2019-2040_wcc_june_2019.pdf

[150] As derived from the GLA Population Yield Calculator (updated 2019). This calculation has been based on a quantum of 758 new residential units.

provide a total of 2,854 sqm play space provision. The split by age category is provided in Table 56.

Table 56: Play space quantum

Play Space Type	Requirement	Proposed Provision
0-4 years	1,915 sqm	1,721 sqm
5-11 years	1,539 sqm	730 sqm
12+ years	1,225 sqm	403 sqm
Total	4,679 sqm	2,854 sqm

15.7.38 Taking into account the overall deficiency in existing formal children's play provision, the receptors are judged to be of high sensitivity. The new provision represents an increase of 1,018 sqm compared to existing and has been redistributed so there is now a greater focus on play for the younger demographic (for ages 0 – 4 years). The play spaces proposed will be fully overlooked and integrated into the development to encourage maximum use and interaction. Therefore, in design terms, they are considered to be an improvement on the existing provision.

15.7.39 However, the proposed quantum of play space still represents a shortfall of 39% compared to the requirement for 4,679 sqm. The impact of the Proposed Development is medium and permanent given there would be increased pressure on existing play space provision during the operational phase and there is insufficient new provision to meet the needs of the new population. This would produce a permanent moderate adverse socio-economic effect which is **significant.**

Community cohesion - returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development

15.7.40 The housing size mix and tenure is assumed to be equally distributed across all the Proposed Development[151]. This will encourage the integration of different social groups within communal spaces, contributing to a mixed and balanced new community.

15.7.41 In addition to new retail floorspace, the Proposed Development includes up to 1,218 sqm of floorspace for social infrastructure (910 sqm Class D1/D2 use floorspace, and up to 308 sqm Class D1 use) which will provide scope for a range of uses[152]. This includes space for a dedicated community hall (158 sqm). Returning and new residents will have easy access to these spaces, and there will be potential for existing neighbourhood residents to also benefit, encouraging links to be forged with the new development.

15.7.42 As set out in paragraph 15.7.3, the Proposed Development includes the provision of new employment-generating floorspace, presenting opportunities for returning residents and new residents of the Proposed Development as well as existing

[151] To note that the Detailed Area will have a higher affordable housing provision than the Outline Area given the needs of the returning residents.
[152] It is recognised that the occupancy of some of these units is likely to be commercially driven.

neighbourhood residents. This retail-based floorspace aligns with the employment trends within Churchill Ward, City of Westminster and London.

15.7.43 Paragraph 15.7.18 onwards demonstrates that the Proposed Development would not result in any significant adverse effects in relation to education, healthcare and community facilities and open space, meaning that the access to provision for returning and new residents, as well as existing neighbourhood residents, would not be compromised.

15.7.44 The Proposed Development is seeking silver CPTED (Crime Prevention Through Environmental Design) accreditation. This will aim to provide a safe and secure environment for residents, employees and visitors through an integrated and holistic design approach. Passive design measures are set out below, all of which are considered to contribute positively towards community cohesion:

- Landscape tress selected to allow good sight lines;
- Natural surveillance from planned activity centres and commercial units;
- Year-round outdoor activities;
- Clear identification of routes; and
- Segregation of vehicles and pedestrians.

15.7.45 The receptors are judged to be of low-high sensitivity (based on existing and returning residents having an established community and new residents have greater reliance on the new development to provide this). The assessment demonstrates that the impact of the Proposed Development is judged to be of a medium magnitude and permanent (given the scope for some potential benefits related to the development and their ability to encourage community cohesion). This would produce a permanent moderate significant beneficial socio-economic effect which is **significant.**

15.8 Additional mitigation

15.8.1 In order to address the likely permanent adverse significant operational effect on receptors seeking play space, mitigation measures are likely to be agreed in the form of Section 106 contributions, initiatives or programmes through the planning process. Such steps may be required by the Local Planning Authority proportionate to the scale and type of the development.

15.9 Residual effects

Construction effects

15.9.1 Construction effects have been scoped out.

Existence effects

15.9.2 There are no significant adverse effects as a result of the existence phase of the Proposed Development. Mitigation is not required.

Operational effects

15.9.3 This assessment found that there would likely be a significant permanent adverse operational effect on receptors seeking play space. Mitigation measures may be required by the Local Planning Authority in the form of Section 106 contributions, initiatives or programmes. On this basis, the overall effect would reduce to a permanent neutral socio-economic effect which is not significant.

15.10 Cumulative effects

15.10.1 The list of developments identified for assessing cumulative effects is presented as Appendix A5. In Table 57 the potential for cumulative effects with each of these developments is examined, and an assessment of the cumulative effects presented where appropriate.

Table 57: Socio-economic cumulative effects

Development	Potential for significant cumulative effects	Comments
Thames Tideway Tunnel - New 25km "super sewer" tunnel for the transfer or storage of waste water, 24 sites.	No	It is noted that this scheme is currently under construction. Since construction effects have been scoped out of the assessment, the cumulative employment effects arising from this development and the Proposed Development are not likely to be significant. Furthermore, this scheme is assumed to result in a relatively low number of jobs during operation. On this basis, the cumulative effects arising from this development and the Proposed Development are again not likely to be significant. Due to the nature of this scheme, it is not considered likely that the proposed non-residential uses would generate any significant cumulative operational housing, social infrastructure or community cohesion effects.
Chelsea Barracks - Various Reserved Matters Application (RMA) and Variation of Conditions to outline permissions 11/12403/OUT, 16/04998/OUT and 17/07176/OUT relating to the major redevelopment of Chelsea Barracks.	Yes	The Chelsea Barracks Masterplan is to deliver a mixed-use scheme including a maximum of 448 residential units, sports centre (Class D2), retail (flexible use within Class A1/A2/A3), health centre (Class D1), non-residential institution/leisure uses (flexible use within Classes D1 and/or D2), hard and soft landscaping and open space.153 It is noted that this scheme is currently under construction. Since construction effects have been scoped out of this assessment, the cumulative employment effects arising from this development and the Proposed Development are not likely to be significant. Furthermore, this scheme is assumed to result in a relatively low number of jobs during operation due to the nature of the employment floorspace154. On this basis, the cumulative effects arising from this development and the Proposed Development are again not likely to be significant. There is potential for a significant cumulative beneficial effect on housing arising from this scheme and the Proposed Development due to the overall quantum of housing to be delivered. Through the outline permissions granted for this scheme, it is assumed that the additional social infrastructure need (education, healthcare, community facilities, open space and play space) have already been mitigated by on-site provision and development contributions towards off-site mitigation. Subsequent reserved matters applications have and will be submitted for this scheme which will need to be in accordance with the development parameters assessed in the Environmental Statement relating to the outline planning applications in order to be acceptable in planning terms.

[153] Mayor of London (2018) Development site at Chelsea Barracks. Available at: https://www.london.gov.uk/what-we-do/planning/planning-applications-and-decisions/planning-application-search/development-site-chelsea-barracks

[154] Employment floorspace comprises local convenience shops as set out: Chelsea Barracks Engagement. Available at: https://www.chelseabarrackspartnership.com/masterplan/

Development	Potential for significant cumulative effects	Comments
Battersea Power Station - Various amendments and discharges of conditions to outline permissions 009/3575, 2013/6639, 2013/6640, 2014/2835, and 2014/2837 relating to the major redevelopment of Battersea Power Station.	Yes	The Battersea Power Station masterplan is to deliver commercial floorspace to support 17,000 permanent jobs, including 150,000sq m of Grade A offices, 75,000sq m of retail and cafes/restaurants, hotels and leisure space and a major new entertainment venue, as well as more than 4,000 new homes155. It is noted that this scheme is currently under construction. Since construction effects have been scoped out of the assessment, the cumulative employment effects arising from this development and the Proposed Development are not likely to be significant. This scheme is considered to provide a significant quantum of employment floorspace, compared to the Proposed Development. However, the Proposed Development is estimated to support more modest employment levels. Together both schemes could be expected to equate to a significant cumulative beneficial effect on employment, although the Battersea Power Station development is significant in its own right There is potential for a significant cumulative beneficial effect on housing arising from this scheme and the Proposed Development due to the overall quantum of housing to be delivered. Through the outline permissions granted for this scheme, it is assumed that the additional social infrastructure need (education, healthcare, community facilities, open space and play space) have already been mitigated by on-site provision and development contributions towards off-site mitigation. Subsequent reserved matters applications have and will be submitted for this scheme which will need to be in accordance with the development parameters assessed in the Environmental Statement relating to the outline planning applications in order to be acceptable in planning terms.
Cundy Street Quarter -Application for full planning permission (20/03307/FULL) for comprehensive residential-led mixed use development- decision pending.	Yes	The Cundy Street Quarter application seeks full planning permission for: Comprehensive residential-led mixed-use redevelopment, including demolition of Kylestrome House, Lochmore House, Laxford House, Stack House, Walden House and structures attached to Coleshill Flats; tree removal and pollarding; erection of a partial sub-basement, basement and buildings varying in height from five to 11 storeys, to provide affordable homes (Class C3), market homes (Class C3), senior living accommodation (comprising Class C3 and / or Class C2), alongside a range of uses at partial sub-basement, basement and ground floor level including retail (Class A1), restaurants / cafes (Class A3), drinking establishments (Class A4); offices (Class B1), community space (Class D1), cinema (Class D2); use of the lower ground floor of the Coleshill Flats as retail and/ or workspace (Class A1 and / or B1); provision of new pedestrian routes; basement car parking; basement and ground floor circulation, servicing, refuse, ancillary plant and storage; provision of hard and soft landscaping; landscaping works and creation of new play

[155] Information on masterplan available at: https://www.london.gov.uk/sites/default/files/Battersea%20Project%20Land%20Company%20Limited%20-%20DP9%20%283230%29.pdf

Development	Potential for significant cumulative effects	Comments
		facilities at Ebury Square; rooftop PV panels; rooftop plant equipment; refurbishment and relocation of Arnrid Johnston obelisk to Five Fields Row; refurbishment and relocation of the water fountain on Avery Farm Row; repair and relocation of the telephone boxes on Orange Square; and other associated works.[156] It is noted that this application is pending decision. Therefore, the cumulative assessment has been undertaken on the basis of the application documents as submitted. Since construction effects have been scoped out of the assessment, the cumulative construction employment effects arising from this development and the Proposed Development are not likely to be significant. Furthermore, this scheme is assumed to result in a relatively low number of jobs during operation. On this basis, the cumulative effects arising from this development and the Proposed Development are again not likely to be significant. There is potential for a significant cumulative beneficial effect on housing arising from this scheme and the Proposed Development due to the overall quantum of housing to be delivered. The additional social infrastructure need arising through this scheme (education, healthcare, community facilities, open space and play space) has been assessed through the Environmental Statement submitted within this application. It is assumed that social infrastructure planning is sufficiently dealt with in the planning system, and therefore any scheme approved will be subject to scrutiny with regards to social infrastructure requirements.

[156] Information on planning application available at https://idoxpa.westminster.gov.uk/online-applications/applicationDetails.do?activeTab=details&keyVal=QB2X8DRP06A00

15.11 Assessment summary

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Construction - temporary effects that arise during the construction of the development						
Scoped out.						
Existence - effects that arise due to the physical presence or existence of the Proposed Development						
Employment Existing businesses located within the site	Clearance of existing employment floorspace. Existing businesses will be required to relocate to other premises prior to construction. Longstanding businesses have been offered a right of first refusal for a new unit on the renewed estate. The magnitude of the impact on existing business is considered to be permanent and medium.	The sensitivity of the receptor is medium. Since the impact is judged to be medium in magnitude and permanent, this would produce a permanent minor adverse effect.	Not significant adverse	No significant adverse effects, therefore mitigation not required	Effect unchanged – not significant	Not significant
Use/Operation – effects arising from the use of the development						
Employment Current and future residents living in City of Westminster and London	Up to 96 – 103 net additional FTE jobs will be supported at the London scale, of which some 32 – 34 are indirect and induced jobs. Up to 49 – 53 net additional FTE jobs will be supported at the pan-borough scale, of which around 11 – 12 are indirect and induced jobs. The magnitude of the impact on current and future residents living in City of Westminster and London is considered to be permanent and small/ medium.	The sensitivity of the receptors is medium. Since the impact is judged to be small/medium in magnitude and permanent, this would produce a permanent minor beneficial effect.	Not significant beneficial	No significant adverse effects, therefore mitigation not required	Effect unchanged – not significant	Not significant

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
Housing Returning residents of the existing estate, current and future residents living in City of Westminster and London	A total of 758 market and affordable housing units will be provided, resulting in a net uplift of 422 units. All existing social rent, intermediate and private units will be replaced as part of the scheme. The Proposed Development will provide 51% affordable housing units which will all be built to meet or exceed the minimum space standards; thereby complying with the relevant planning policies. A proportion of 20.2% family sized units will provided across the masterplan; which falls slightly below the 25% target. The magnitude of the impact on returning residents of the existing estate, current and future residents living in City of Westminster and London is considered to be permanent and medium.	The sensitivity of the receptors is high. Since the impact is judged to be medium in magnitude and permanent, this would produce a permanent moderate beneficial effect.	Significant beneficial	No significant adverse effects, therefore mitigation not required	Effect unchanged – significant beneficial	Significant beneficial
Social infrastructure: Healthcare provision Early years provision Primary school provision Secondary school provision Community facilities Open space provision Returning residents of the existing estate, existing neighbourhood residents, and future	No onsite healthcare facilities will be provided. Additional early years, primary school and secondary school facilities do not form part of the Proposed Development. A dedicated community hall will be provided (158 sqm). A total of 9,515 sqm of publicly accessible open space will be provided. The magnitude of the impacts on returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development are considered to be permanent and range from small to medium.	The sensitivity of the receptors ranges from low to high. Since the impacts are judged to range from small to medium in magnitude and permanent, this produces a combination of permanent neutral and minor adverse effects.	Not significant adverse	No significant adverse effects, therefore mitigation not required	Effect unchanged – not significant	Not significant

Receptor	Impacts	Effects	Significance	Mitigation and enhancement	Residual effects	Cumulative effects
residents of the Proposed Development						
Social infrastructure: Play space provision Returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development	A total of 2,854 sqm play space will be provided. This represents a shortfall of 39% compared to the requirement. The magnitude of the impact on returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development is considered to be permanent and medium.	The sensitivity of the receptors is high. Since the impact is judged to be medium in magnitude and permanent, this would produce a permanent moderate adverse effect.	Significant adverse	Planning contributions may be required by the Local Planning Authority through the planning process, proportionate to the scale and type of the development, in the form of Section 106 contributions, initiatives or programmes.	Permanent neutral effect.	Not significant
Community cohesion Returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development	The Proposed Development will provide new employment opportunities and a mix of uses including new community hall. The Proposed Development is also seeking silver CPTED (Crime Prevention Through Environmental Design) accreditation, in order to help provide a safe and secure environment for residents, employees and visitors. The magnitude of the impact on returning residents of the existing estate, existing neighbourhood residents, and future residents of the Proposed Development is considered to be medium and permanent.	The sensitivity of the receptors ranges from low to high. Since the impact is judged to be medium in magnitude and permanent, this would produce a permanent moderate beneficial effect.	Significant beneficial	No significant adverse effects, therefore mitigation not required	Effect unchanged – significant beneficial	Significant beneficial