Mount Pleasant

Environmental Statement

Client Name: Royal Mail Group Limited
Document Reference: EED13235_R_1.1.1
Project Number: EED13235

Quality Assurance – Approval Status

This document has been prepared and checked in accordance with
Waterman Group's IMS (BS EN ISO 9001 2008 and BS EN ISO 14001 2004)

Issue	Date	Prepared by	Checked by	Approved by
First	April 2013	Matthew Edgar	Alice Humphries	Jonathan Dosser

Comments

Comments

Our Markets

Property & Buildings

Transport & Infrastructure

Energy & Utilities

Environment

Disclaimer

This report has been prepared by Waterman Energy, Environment & Design Limited, with all reasonable skill, care and diligence within the terms of the Contract with the client, incorporation of our General Terms and Condition of Business and taking account of the resources devoted to us by agreement with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at its own risk.

MOUNT PLEASANT – ERRATA NOTE

This note has been prepared by DP9 on behalf of the Royal Mail Group Ltd. The note should be read in conjunction with all documents and plans submitted in support of the following planning applications:

- The Calthorpe Street planning and associated conservation area consent applications to the London Borough of Islington; and
- The Phoenix Place planning application to the London Borough of Camden.

The above applications were submitted simultaneously to the relevant Local Planning Authority on 1 May 2013. Following the submission of the applications the London Borough of Camden requested that the redline application boundary for the Phoenix Place application was re-drawn to mirror the administrative boundary down the centre of Phoenix Place.

As a consequence, the redline boundary for both applications has been withdrawn and amended plans submitted to the relevant Local Planning Authority, alongside this Errata Note. The redline boundary change affects the site areas as follows:

- Calthorpe Street Site – From 2.22 ha to 2.36 ha
- Phoenix Place Site – From 1.31 ha to 1.17 ha

For the avoidance of doubt, the application proposals for the Mount Pleasant Site as a whole are unaffected and the documents submitted in support of each application remain valid and robust.

The table below lists the application documents submitted for each planning application and whether, other than plans showing the respective redline boundary and resultant site areas, this change affects the documents or conclusions.

APPLICATION DOCUMENT	**EFFECT OF THE REDLINE BOUNDARY CHANGE**
Documents submitted in support of the Calthorpe Street Site application only	
Planning Application Form, Land Ownership Certificate A and Agricultural Holdings Certificates;	Unaffected
The Covering Letter	Unaffected

Design and Access Statement: Volume 2: Calthorpe Street Development	Density calculations on page 45 amended to 1,036 habitable rooms within a site area of 2.36ha to provide a density calculation of 438 habitable rooms/hectare.
Calthorpe Street Waste Management Plan	Unaffected
Calthorpe Street Framework Travel Plan	Unaffected
Calthorpe Street Operational Waste Plan	Unaffected
Calthorpe Street Sustainability Statement including Code for Sustainable Homes Pre-Assessment and BREEAM Pre-Assessment	Unaffected
Calthorpe Street Energy Strategy including Overheating Report	Unaffected
Documents submitted in support of the Phoenix Place Site application only	
Planning Application Form, Land Ownership Certificate B and Agricultural Holdings Certificates	Unaffected
The Covering Letter	Unaffected
Design and Access Statement: Volume 3: Phoenix Place Development	Density calculations on page 31 amended to 1,077 habitable rooms within a site area of 1.17 to provide a density calculation of 921 habitable rooms/hectare.
Phoenix Place Waste Management Plan	Unaffected
Phoenix Place Framework Travel Plan	Unaffected
Phoenix Place Operational Waste Plan	Unaffected
Phoenix Place Sustainability Statement including Code for Sustainable Homes Pre-Assessment and BREEAM Pre-Assessment	Unaffected

Phoenix Place Energy Strategy including Overheating Report	Unaffected
The application documents which assess the Development across the Site are set out below	
Planning Statement which includes the Economic and Regeneration Statement and draft Section 106 Heads of Terms	Density calculations for Calthorpe Street (page 37) amended to 1,036 habitable rooms within a site area of 2.36ha to provide a density calculation of 438 habitable rooms/hectare. Density calculations for Phoenix Place (page 38) amended to 1,077 habitable rooms within a site area of 1.17 to provide a density calculation of 921 habitable rooms/hectare.
Design and Access Statement: Volume 1: Mount Pleasant	Unaffected
Environmental Statement: Volume 1: Main Text	Unaffected
Environmental Statement: Volume 2: Figures	Unaffected
mental Statement: Volume 3: Townscape, Visual and Built Heritage Assessment	Unaffected
Environmental Statement Volumes 4A to 4F (Appendices)	Unaffected
Environmental Statement Non-Technical Summary	Unaffected
Public Realm and Playspace Strategy	Unaffected
Housing Statement	Unaffected
Internal Daylight and Sunlight Assessment	Unaffected
Residential Travel Plan	Unaffected
Delivery and Servicing Plan	Unaffected

Framework Construction Logistics Plan	Unaffected
Parking Management Plan	Unaffected
Health Impact Assessment	Unaffected
Community Involvement Report	Unaffected

DP9

4 June 2013

Contents

Volume 1 – Main Text

Volume 2 – Figures

Volume 4E – Appendices

Volume 4F – Appendices

Volume 4G– Appendices

List of Abbreviations

AAWT	Annual Average Weekly Traffic
ABL	Above Ground Level
ALES	Active Liquid Effluent System
ADF	Average Daylight Factor
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
APSH	Annual Probable Sunlight Hours
APIS	Air Pollution Information System
APZ	Archaeology Priority Zone
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BAP	Biodiversity Action Plan
BGL	Below Ground Level
BGS	British Geological Society
BNL	Basic Noise Level
BPM	Best Practical Means
BRE	Building Research Establishment
BS	British Standard
CCoP	Construction Code of Practice
CEMP	Construction Environment Management Plan
CFMP	Catchment Flood Management Plan
CoPA	Control of Pollution Act
CoSHH	Control of Substances Hazardous to Health
CROW	Wildlife and Countryside Act
CRTN	Calculation of Road Traffic Noise
dB	Decibels (SI unit of noise)
DBA	Desk Based Assessment
DCC	Dorset County Council
DCLG	Department for Communities and Local Government
DEFRA	Department for the Environment, Food and Rural Affairs
DGTP	Dorset Green Technology Park
DMRB	Design Manual for Roads and Bridges developed for the Department of Transport's
DoE	Department of the Environment
DTI	Department of Trade and Industry
DTLR	Department of Transport, Local Government and Regions
DWT	Dorset Wildlife Trust
EA	Environment Agency
EH	English Heritage
EHO	Environmental Health Officer
EI	Energy Institute
EIA	Environmental Impact Assessment
EMP	Environment Management Plan
EPA	Environmental Protection Act

EPSL	European Protected Species Licence
EPUK	Environmental Protection UK
ES	Environmental Statement
EU	European Union
FDS	Foul Drainage Strategy
FEH	Flood Estimation Handbook
FRA	Flood Risk Assessment
FTE	Full Time Equivalent
GEA	Gross External Area
GIA	Gross Internal Area
GP	General Practitioners
ha	Hectares
HA	Highways Agency
HAP	Habitat Action Plan
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
HSE	Health & Safety Executive
IEEM	Institute of Ecology and Environmental Management
IEMA	Institute of Environmental Management and Assessment - formerly the IEA (Institute of Environmental Assessment)
IHT	Institute of Highways and Transport
JNCC	Joint Nature Conservancy Council
km	Kilometre
kph	Kilometres per hour
LAQM	Local Air Quality Management
LBC	London Borough of Camden
LBI	London Borough of Islington
LDF	Local Development Framework
LI	Landscape Institute
LNR	Local Nature Reserve
LowCEF	Low Carbon Energy Facility
LPA	Local Planning Authority
LPAS	Local Planning Authorities
LPG	Liquid Petroleum Gas
LTP	Local Transport Plan
m	Metre
$\mu g/m^3$	micrograms per cubic meter
mg/m^3	Milligrams per cubic metre
mm/s or mms^{-1}	millimetres per second
MUGA	Multi Use Games Areas
NAL	Noise Action Level
NDA	Nuclear Decommissioning Authority
NE	Natural England
NEC	Noise Exposure Category
NERC	Natural Environment and Rural Communities Act
NGR	National Grid Reference

NHS	National Health Services
NIA	Net Internal Area
NII	Nuclear Installation Inspectorate
NMR	National Monument Record
NNL	National Nuclear Laboratories
NO_2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
NSL	No Sky Line
NSR	Noise Sensitive Receptors
NTS	Non-technical Summary
OD	Ordnance Datum
ODPM	Office of Deputy Prime Minister
ONS	Office of National Statistics
OS	Ordnance Survey
PDC	Purbeck District Council
PEM	Project Environment Manager
PERA	Preliminary Environmental Risk Assessment
PM_{10}	Particulate Matter with a mean aerodynamic diameter of 10mm
$PM_{2.5}$	Particulate Matter with a mean aerodynamic diameter of 2.5mm
POL	Petrol Oil Lubrication
ppb	parts per billion
PPE	Personal Protective Equipment
PPG	Planning Policy Guidance (note)
ppm	parts per million
PPS	Planning Policy Statement
RSRL	Research Site Restoration Limited
RTD	River Terrace Deposits
SAC	Site Assessment Criteria
SAM	Schedule Ancient Monument
SANGs	Suitable Alternative Natural Green Space
SFRA	Strategic Flood Risk Assessment
SGHWR	Steam Generating Heavy Water Reactor
SI	Site Investigation
SINC	Site of Importance for Nature Conservation
SoPI	Species of Principal Importance
SOS	Secretary of State
SPD	Supplementary Planning Document
SPZ	Source Protection Zone
SRN	Strategic Road Network
SSSI	Sites of Special Scientific Interest
SuDS	Sustainable Urban Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
TG	Technical Guidance
TP	Travel Plan
TPF	Travel Plan Framework

TPO	Tree Preservation Order
UDP	Unitary Development Plan
UK	United Kingdom
UKAEA	United Kingdom Atomic Energy Authority
UKBAP	United Kingdom Biodiversity Action Plan
VSC	Vertical Sky Component
WAC	Waste Acceptance Criteria
WCA	Wildlife and Countryside Act
WNRE	Winfrith Nuclear Research Establishment
ZEBRA	Zero Energy Breeder Reactor Assembly
ZoI	Zone of Influence
ZVI	Zone of Visual Influence

Glossary

A1 Use Class	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments (For example, A1 for shops, hairdressers, travel and ticket agencies, post offices and showrooms).
AADF/T Annual Average Daily Flow/Total	A daily total traffic flow (24 hours), expressed as a mean daily flow across all 365 days of the year.
Above Ordnance Datum (AOD)	Land levels in the UK are measured relative to the average sea level at Newlyn in Cornwall. This average level is referred to as 'Ordnance Datum'. Benchmarks, spot heights and contours on Ordnance Survey maps of the UK show heights above Ordnance Datum in metres.
Accuracy	A measure of how well a set of data fits the true value.
Accuracy	Level of agreement between true value and observed value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Alluvium	Sediment laid down by a river. Can range from sands and gravels deposited by fast flowing water and clays that settle out of suspension during overbank flooding. These may cover early archaeological deposits.
Ambient sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between 2 years, which is useful for pollutants that have higher concentrations during the winter months.
Aquifer	A below ground, water-bearing layer of soil or rock.
Archaeological Priority Area or Zone	Areas of known archaeological significance or potential designated by the local authority in consultation with EH.
Archaeological watching brief	Attendance on site of a suitably qualified or experienced archaeologist during the course of ground excavations, for the purpose of making records of archaeological evidence revealed during such excavations, usually working to a brief agreed with the local planning authority.
Archaeology	The scientific study of ancient or historic physical remains of human activity, both above and below ground.
B1 Class Use	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments, for Offices (other than financial and professional services providing for the visiting members of the public).
B2 Class Use	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments, for industrial process other than one falling within class B1 (excluding incineration purposes, chemical treatment or landfill or hazardous waste).
B8 Class Use	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments, for storage or distribution (including open air storage)
Background noise	Background noise is the term used to describe the noise measured in the absence of the noise under investigation. It is described as the average of the minimum noise levels measured on a sound level meter and is measured statistically as the A-weighted noise level exceeded for ninety percent of a sample period. This is represented as the L90 noise level (see below).

Baseline	Existing environmental conditions present on, or near a site, against which future changes may be measured or predicted.
Baseline	Existing environmental conditions present on, or near, a site against which future changes may be measured or predicted.
Baseline	Existing environmental conditions present on, or near, a site against which future changes may be measured or predicted.
Baseline	Existing environmental conditions present on, or near, a site against which future changes may be measured or predicted.
Biodiversity	A term used to describe all aspects of biological diversity.
Brown roofs	A brown roof is a roof of a building that is created to provide a brownfield-type habitat and is particularly beneficial to wildlife.
Brownfield site	Sites that comprise previously developed land.
Built heritage	Upstanding structure of historic interest.
C1 Class Use	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments, for hotels, boarding and guest houses where no significant element of care is provided (excludes hostels).
C2 Class Use	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments, for residential care homes, hospitals, nursing homes, boarding schools, residential colleges and training centres
C3 Class Use	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments, for dwelling houses (family houses or houses occupied by up to 6 residents living together as a single household).
Conceptual Exposure Model	Textual and or schematic hypothesis of the nature and sources of contamination, potential migration pathways (including description of the ground and groundwater) and potential receptors, developed on the basis of the information from the preliminary investigation and refined during subsequent phases of investigation and which is an essential part of the risk assessment process. Note 1: The conceptual exposure model is initially derived from the information obtained by the preliminary investigation. This conceptual model is used to focus subsequent investigations, where these are considered to be necessary, in order to meet the objectives of the investigations and the risk assessment. The results of the field investigation can provide additional data that can be used to further refine the conceptual model.
Conservation Area	An area designated under Planning (Listed Buildings and Conservation Areas) Act 1990 as being of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.
Conservation Area	An area designated under the Planning (Listed Buildings and Conservation Areas) Act 1990 as being of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.
Contaminated Land	As defined by section 78A(2) Part IIA of the Environmental Protection Act 1990, this refers to "any land which appears to the District Council in whose area it is situated to be in such a condition, by reason of substances in, on or b. pollution of controlled waters is being, or is likely to be caused;…" under the land, that: a. significant harm is being caused or there is a significant possibility of such harm being caused; or b. pollution of controlled waters is being, or is likely to be caused;…"
Contamination	Contamination is the addition, or the result of addition, or presence of a material or materials to, or in, another substance to such a degree as to render it unfit for its intended purpose.
Contamination	Presence of a substance which is in, on or under land, and which has the potential to cause significant harm or to cause significant pollution of controlled water. Note 1: There is no assumption in thisdefinition that harm results from the presence of the contamination. Note 2: Naturally enhanced concentrations of harmful substances can fall within this definition of contamination. Note 3: Contamination may relate to soils, groundwater or ground gas.

Controlled water	Inland freshwater (any lake, pond or watercourse above the freshwater limit), water contained in underground strata and any coastal water between the limit of highest tide or the freshwater line to the three mile limit of territorial waters. Note 1: See Section 104 of The Water Resources Act 1991.
Controlled Waters	Ditches rivers, estuaries, coastal waters, lakes and groundwaters – as distinct from sewers.
Controlled Waters	Ditches rivers, estuaries, coastal waters, lakes and groundwaters – as distinct from sewers.
Cumulative Effects	Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions.
D1 Class Use	Class of land use as set out in Town and Country Planning (Use Classes) Order 1987, and its subsequent amendments, for clinics, health centres, crèches, day nurseries, day centres, schools, art galleries (other than for sale or hire), museums, libraries, halls, places of worship, church halls, law court, non residential education and training centres
dB(a)	The unit of noise measurement (measured on a logarithmic scale), which expresses the loudness in terms of decibel (dB) scale and the frequency factor (A).
dB(A): A-weighted decibels	The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the 'A' filter. A sound level measured with this filter switched on is denoted dB(A) or as LA dB. Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
Dewatering	The removal of water/effluent.
Dust	Fine particles of solid materials ranging in size from 1 to 75 um diameter (see British Standard 3405) capable of being resuspended in air and settling only slowly under the influence of gravity where it may cause nuisance.
Ecology	The study of living organisms in relation to their surroundings.
Effluent	A fluid discharged or emitted to the external environment.
EIA Development	Development that falls under the Schedule 1 or 2 of the Town and Country Planning (EIA) 1999 as requiring an EIA.
Emission	A material that is expelled or released to the environment. Usually applied to gaseous or odorous discharges to the atmosphere.
Emission rate	The quantity of a pollutant released from a source over a given period of time.
Environmental effect	The total effect of any operation on the surrounding environment.
Environmental Impact	The total effect of any operation on the surrounding environment.
Environmental Impact Assessment	A technique for ensuring that the likely effects of new development on the environment are fully understood and taken into account before the development is allowed to go ahead. It provides a focus for public scrutiny of the project and enables the importance of the predicted effects, and the scope for modifying or mitigating them, to be properly evaluated by the decision-making authority.
Environmental Management Plan	A plan to undertake activities which provide for sound environmental management of a project so that adverse environmental impacts are minimised and mitigated.
Excavation (archaeological)	An archaeological excavation is a 'programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures, and as appropriate, retrieves artefacts, ecofacts and other remains within a specified area. The records made and objects gathered during fieldwork are studied and the results of the study published in detail appropriate to the project design'.

Exceedence	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
Fauna	Animal life.
Floodplain	The area of land available for flood waters to occupy.
Flora	The plant life of a particular geographical area.
Footprint	Perimeter of building's ground floor plan
Geology	The physical and chemical structure of the ground.
Green Roofs	A green roof is a roof of a building that is partially or completely covered with vegetation and soil, or a growing medium, planted over a waterproofing membrane. They take the form of gardens and can include recreational areas and trees.
Gross	The sum total, without deduction.
Gross External Area	The floor area contained within the building measured to the external face of the external walls
Ground Investigation	An in-depth investigation involving further sampling and analysis, such as the gathering of samples from the ground, walls, ceilings for the detection of contamination, asbestos and or archaeological remains.
Groundwater	Water associated with soil or rocks below the ground surface but is usually taken to mean water in the saturated zone.
Habitat	The living place of an organism characterised by its physical or biotic priorities.
Harm	Adverse effect on the health of living organisms, or other interference with ecological systems of which they form part, and, in the case humans, including property.
Hazard	Inherently dangerous quality of a substance, procedure or event.
Impact Significance	Opinions from a relevant planning authority at an initial stage as to what are the nature and potential scale of the environmental impacts arising from the proposed development, and assessing what further studies are required to establish their significance.
In situ	In the natural, original or appropriate position.
Indirect jobs	Jobs created in firms supplying goods and services to construction and operational workers.
Interceptors	Used to intercept rainwater or spillages contaminated with oil and to retain the liquid for subsequent separation.
Intrusive investigation	An in-depth investigation involving further sampling and analysis, such as the gathering of samples from the ground, walls, ceilings for the detection of contamination, asbestos and or archaeological remains.
Invertebrate	An animal that does not possess a backbone.
LA_{10}	The noise level exceeded for 10% of the measurement time.
LA_{90}	The A weighted noise level exceeded for 90% of the specified measurement period, which following BS4142: 1990 is typically used to define background noise level.
LA_{eq}	The Equivalent Continuous A-weighted Sound Pressure Level. The sound pressure level of a steady sound that, over the same time as the measurement period, contains the same total acoustic energy as the sound field being measured. This takes into account the level and duration of noise events and is considered the indicator of the Ambient Noise Level.
LA_{max}	The single highest noise level recorded during a measurement period.
Landmarks	Prominent features in the landscape.
Landscape Character	Exhibit distinct character and intrinsic qualities, often based on the historic built form or layout in urban areas.
Listed Building	A building included in a list produced by the Secretary of State for Culture, Media and Sport. It comprises buildings and other structures that are of special architectural or historic interest.

Locally Listed Building	While not statutory listed, buildings are of good quality design and appearance or have historical significance, or are important features in their own right and which also make a significant contribution to the character and appearance of the locality
Made Ground	Artificial deposit. Artificial deposit. An archaeologist would differentiate between modern made ground, containing identifiably modern inclusion such as concrete (but not brick or tile), and undated made ground, which may potentially contain deposits of archaeological interest.
mg/m^3 milligram per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1mg/m3 means that one cubic metre of air contains one milligram (thousandth of a gram) of pollutant.
Mitigating factor	A matter to be taken into account as a benefit to offset any perceived or demonstrable harmful impact.
Mitigation (measure)	The measures put forward to prevent, reduce and where possible, offset any adverse effects on the environment.
Model adjustment	Following model verification, the process by which modelled results are amended. This corrects for systematic error.
Multiplier	Figure used to calculate the number of induced and indirect jobs created.
National Planning Policy	National Planning Policy Guidance/Statements set out the Government's policies on different aspects of planning. Local planning authorities must take their content into account in preparing their development plans and guidance may also be material to decisions on individual planning applications and appeals.
National Sites and Monuments Records	A computerised record of information for all statutory listed buildings, known archaeological sites and stray finds, parks and gardens of special historic interest.
Net	After all deductions have been made.
Noise	Sound which a listener does not wish to hear.
Noise Exposure Category (NEC)	Noise Exposure Categories are specified to give guidance on the determination of the suitability of sites for new residential development
Non-Technical Summary (NTS)	A summary of the Environmental Statement in non-technical language providing a concise, yet comprehensive summary of the likely effects of the project on the environment.
Non-Technical Summary (NTS)	A summary of the Environmental Statement in non-technical language providing a concise, yet comprehensive summary of the likely effects of the project on the environment.
Nuisance	A minor annoyance or inconvenience.
Ordnance Datum (OD)	A vertical datum used by Ordnance Survey as the basis for deriving altitudes on maps.
Particulate matter	Discrete particles in ambient air, sizes ranging between nanometres (nm, billionths of a metre) to tens of micrometres (µm, millionths of a metre).
Pathway	Mechanism or route by which a contaminant comes into contact with, or otherwise affects, a receptor.
Permeability	The extent to which an environment allows a variety of access routes through it. A permeable environment is one where there is ease of movement and where people have a choice in the routes they may use.
Phase 1 habitat survey	Broad scale and rapid technique for identifying and mapping habitats according to standard definitions and based on vegetation.
Pile	A timber, steel or concrete post that is driven, jacked or cast (bored) into the ground to carry vertical or horizontal loads.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
Precision	Level of agreement within a series of measurements of a parameter.
Receptor	Persons, living organisms, ecological systems, controlled water, atmosphere, structures and utilities that could be adversely affected by the contaminant(s).
Remediation	Cleanup or other methods used to remove or contain a toxic spill or hazardous materials.

Residual impacts	Those impacts of the development that cannot be mitigated following implementation of mitigation proposals.
Risk	Probability of the occurrence, magnitude and consequences of an unwanted adverse effect on a receptor.
Risk assessment	Process of establishing, to the extent possible, the existence, nature and significance of risk.
Road link	A length of road which is considered to have the same flow of traffic along it. Usually, a link is the road from one junction to the next.
Sampling	Methods and techniques used to obtain a representative sample of the material under investigation.
Scheduled Monument	An archaeological monument that is included in the Schedule required to be maintained by the Secretary of State under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979. Such monuments are protected by law.
Scoping	An initial stage in determining the nature and potential scale of environmental impacts arising as a result of a development, and an assessment of what further studies are required to establish their significance.
Scoping Study	Preliminary study investigated the potential environmental impacts that could arise from the development, used to identify issues for further investigation in the EIA.
(Sensitive) Receptor	A component of the natural, created or built environment such as human being, water, air, a building, or a plant that is affected by an impact.
Setting	The context in which a building or area can be appreciated.
Soil	Upper layer of the earth's crust composed of mineral parts, organic substance, water, air and living matter. Note 1: In accordance with BS 10175:2001 the term soil has the meaning ascribed to it through general use in civil engineering and includes topsoil and subsoil; deposits such as clays, silt, sand, gravel, cobbles, boulders and organic deposits such as peat; and material of natural or human origin (e.g. fills and deposited wastes). The term embraces all components of soil, including mineral matter, organic matter, soil gas and moisture, and living organisms.
Source	Location from which contamination is, or was, derived. Note 1: This could be the location of the highest soil or groundwater concentration of the contaminant(s).
Statutory Consultees	Groups or bodies that, by law, must be consulted as part of the planning application process for certain types of development.
Strategic Views	View corridor; viewing corridor as defined in LPAC Strategic Views.
Substation	An electrical unit transforming the voltage (power) of electricity from high to low (or the reverse) so as to provide electricity of a suitable strength for a particular use (e.g. domestic or industrial use).
Sustainable Development	Development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.
Topography	The natural or artificial features, level and surface form of the ground surface.
Transport Assessment	An inclusive process to determine all aspects of movement by people and vehicles associated with the new development. It demonstrates how the development affects demand for travel and how all travel demands and servicing requirements will be met.
Travel Plan	A transport plan whose aim is to reduce reliance on private cars and increase use of public transport.
µg/m^3 micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1ug/m3 means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
Uncertainty	Parameter, associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurement.

Unexploded Ordnance	Explosive weapons (bombs, shells, grenades, land mines etc) that did not explode when they were employed and still pose a risk of detonation, potentially many decades after they were used or discarded.
Unitary Development Plan	A statutory document providing a framework of acceptable uses within a borough, defining areas where development is not desired or where it needs to be carefully directed, and a detailed basis for the control of development. It also aims to consider carefully the needs of different people in a borough and promote equal opportunities.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Validation (monitoring)	Screening monitoring data by visual examination to check for spurious and unusual measurements (see also ratification).
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.
Zone of Visual Influence	Area within which a proposed development may have an influence or effect on visual amenity.

1. Introduction

Background

1.1. Royal Mail Group Limited (hereafter referred to as the 'Applicant') is seeking to obtain detailed planning permission for the redevelopment of land (hereafter referred to as the 'Site') adjacent to and forming part of, the Applicant's Mount Pleasant Sorting Office located in Farringdon, London. The Site, which covers an area of approximately 3.53 hectares (ha), is currently used as a delivery / service yard and staff car park for the Mount Pleasant Sorting Office, which is located immediately to the south-east of the Site.

1.2. The Site, which is centred on National Grid Reference: 530987,182288, straddles the administrative boundaries of the London Borough of Islington (LBI) and the London Borough of Camden (LBC). The Site is separated into two distinct areas. The eastern part of the Site (hereafter referred to as the 'Calthorpe Street site') is located within the administrative boundary of LBI and the western part of the Site (hereafter referred to as the 'Phoenix Place site') is located within the administrative area of LBC. The Site is bound by Farringdon Road to the north-east, Calthorpe Street to the north-west, Gough Street to the south-west, Mount Pleasant and the Mount Pleasant Sorting Office to the south-east. The road, Phoenix Place, extends through the Phoenix Place site, in a north-east to south-east direction. The location of the Site and the planning application boundary are shown in Figure 1.1 and Figure 1.2 respectively.

1.3. The Applicant is currently consolidating the operations of its Sorting Offices across London, which includes the intensification and modernisation of the Mount Pleasant Sorting Office located to the south-east of the Site and adjoining the south-eastern boundary of the Calthorpe Street site. Works associated with the modernisation and refurbishment of the Mount Pleasant Sorting Office were underway at the time of undertaking the Environmental Impact Assessment (EIA) of the redevelopment proposals on the Site. Following consolidation and modernisation, the yard and operational vehicle park of the adjacent Mount Pleasant Sorting Office will become available for redevelopment.

1.4. The redevelopment proposal for the Site (hereafter referred to as the 'Entire Development') would involve the demolition of above ground structures and buildings on the Site, together with Enabling Works on the Calthorpe Street site and construction of a new residential-led scheme across the Site. The Entire Development (that is the Calthorpe Street Development and Phoenix Place Development) comprises ten buildings (known as Buildings A, B, C, D, E, F, G, H, J and K) to accommodate:

- 681 residential units (Use Class C3) totalling 76,737m^2 Gross Internal Area (GIA) of residential floorspace, of which 132 residential units would be affordable, subject to the viability assessment;
- Office uses (Use Class B1) totalling 4,260m^2 GIA of floorspace; and
- Flexible retail and community use (Use Classes A1, A2, A3, D1 and / or D2), totalling 2,250m^2 GIA of floorspace.

1.5. The Entire Development comprises a significant level of new residential units. The precise mix, tenure split and level of affordable housing provision is subject to on-going viability testing and may change through the course of the applications being determined by LBC and LBI.

1.6. To facilitate the redevelopment of the Site and enable the continued 24 hour operation of the adjacent Mount Pleasant Sorting Office, Enabling Works would be undertaken on the Calthorpe Street site as the first phase of the Calthorpe Street Development. In summary, the Enabling Works would include:

- Moving all parking associated with Mount Pleasant Sorting Office into an extended basement beneath the Sorting Office and build a concrete slab at ground floor level over part of the existing *Bathtub* that would be retained by the Applicant;
- Relocating vehicular access on Farringdon Road, providing access to a ramp serving the basement, ground floor loading bays, and parking areas;
- Relocating the ventilation shaft and the escape stair from the underground infrastructure; and
- Constructing a new lightweight acoustic roof between the first floor level (north-western elevation) of the Mount Pleasant Sorting Office and proposed second floor level (above ground) of proposed Building F.

1.7. It is anticipated that the entire Site would be redeveloped, although there is a possibility that either the Calthorpe Street site or the Phoenix Place site could be developed in isolation. However, since the Enabling Works on the Calthorpe Street site would proceed as the first phase of the Calthorpe Street Development, there are three likely main Development Scenarios for the Site, as follows;

- Development Scenario 1: the Entire Development (i.e. Calthorpe Street Development (including Enabling Works) and Phoenix Place Development);
- Development Scenario 2: Calthorpe Street Development (including Enabling Works); and
- Development Scenario 3: Phoenix Place Development.

1.8. Further details of the Development Scenarios are included in Chapter 2: *EIA Methodology*. Planning permission for redeveloping the Site is being sought through two applications, as follows:

- Calthorpe Street and Enabling Works Planning Application (which includes Conservation Area Consent); and
- Phoenix Place Planning Application.

1.9. Further details of the two planning applications are included in Chapter 5: *The Proposed Development*.

1.10. EIA is a process that must be followed for certain types of development before a decision can be made on whether planning permission should be granted. The Applicant recognises that development of any of the three Development Scenarios falls within Schedule 2, Category 10b of The Town and Country Planning (Environmental Impact Assessment) Regulations 2011[1] (hereafter referred to as the 'EIA Regulations') as an 'urban development' project which, owing to its nature, scale and location, has the potential to give rise to significant effects on the environment. The Applicant therefore voluntarily commissioned an EIA to be undertaken for the three Development Scenarios, the findings of which are presented within this Environmental Statement (ES), which accompanies the suite of planning applications. The planning applications have been submitted to LBI and LBC as appropriate for determination, who will take into account the likely significant environmental effects of the three Development Scenarios reported in this ES.

1.11. This ES describes how the likely significant environmental effects of the three Development Scenarios during demolition and construction works, and once the Development Scenarios are completed and operational, were identified and assessed. Where potentially significant *adverse* effects on the environment were identified, measures are set out in this ES to prevent, reduce and, where possible, offset these effects. These are known as 'mitigation measures'. In accordance with the EIA Regulations, this ES then describes the nature and significance of the likely residual effects (i.e. assuming implementation of the mitigation measures). Further information on how the scope of the EIA was defined and the structure of this ES is provided in Chapter 2: *EIA Methodology*.

Site Context

1.12. The Mount Pleasant Sorting Office, adjacent to the Site, currently provides mail processing and delivery facilities for mail, including the Central London Mail Centre, some international distribution operations and the City Delivery Office (Use Classes B1 and B8). The Mount Pleasant Sorting Office also currently accommodates the British Postal Museum and Archive (BPMA). To support these activities, the Calthorpe Street site is currently used as a delivery and servicing yard where loading and unloading operations take place. The majority of the Phoenix Place site is undeveloped and is currently used as a car park for Mount Pleasant Sorting Office staff. At the time of undertaking the EIA, the building in the northern part of the Phoenix Place site was being temporarily used by the Applicant to accommodate its I.T. department.

1.13. The adjacent Mount Pleasant Sorting Office is operated 24-hours a day with vehicles loading and unloading at any time of the day or night. Principal vehicular access to the Calthorpe Street site is currently located on the eastern boundary on Farringdon Road, whilst vehicles can also currently exit onto Phoenix Place or Farringdon Road, or alternatively onto Mount Pleasant in emergencies. There is also access to basement loading areas from Mount Pleasant that exits onto Phoenix Place.

1.14. The Applicant is currently rationalising mail processing operations across London, with the Sorting Offices at Rathbone Place and Nine Elms being consolidated into the Mount Pleasant Sorting Office. As part of the modernisation and refurbishment of the Mount Pleasant Sorting Office, which is being undertaken under a number of planning permissions and permitted development rights, the international distribution operations will be relocated elsewhere offsite. It is anticipated that the Applicant will complete the modernisation works and intensification of the operations at the Mount Pleasant Sorting Office by the end of 2013. In addition, the BPMA has received planning permission from LBC (planning application reference: 2012/1897/P) to relocate the BPMA from the adjacent Mount Pleasant Sorting Office to Calthorpe House, 15 to 20 Phoenix Place, which is located largely to the north of the Phoenix Place site, although the buildings to the rear of 5 to 20 Phoenix Place, extend across the northern corner of the Phoenix Place site.

1.15. Topographically, the Site slopes down from Calthorpe Street to Mount Pleasant (road). Towards Calthorpe Street, the Phoenix Place site is at 19.44m Above Ordnance Datum (AOD); dropping to 13.98m AOD at the junction of Mount Pleasant with Phoenix Place. Within the Calthorpe Street site, the delivery and service yard comprises two levels, with upper and lower level parking and loading areas connected by ramps. The north corner of the Calthorpe Street site (junction of Farringdon Road with Calthorpe Street) is at 18.95m AOD whilst at the southern corner near to Phoenix Place, the Calthorpe Street site is at 18.41m AOD. The upper level is at similar levels to the surrounding ground level and the lower level of the Calthorpe Street site (known as '*The Bathtub*') is at 14.70m AOD.

1.16. There are numerous items of underground infrastructure beneath the Calthorpe Street site, including a Post Office Railway ('Mail Rail') station, depot and tunnels, ventilation shafts and the River Fleet Sewer Branch. The River Fleet Sewer extends beneath Phoenix Place between the Calthorpe Street site and the Phoenix Place site. The London Underground Metropolitan Line extends to the north-east of Calthorpe Street beneath Farringdon Road.

1.17. The Calthorpe Street site is located within the Rosebery Conservation Area and adjacent to Bloomsbury Conservation Area, Hatton Garden Conservation Area, Clerkenwell Green Conservation Area and New River Conservation Area. Although the Phoenix Place site is not located within a Conservation Area, the Bloomsbury Conservation Area and Hatton Garden Conservation Area are located immediately to the north and south of this part of the Site, respectively. There are no listed buildings or structures located within the Site, although there are numerous listed buildings surrounding the Site; the nearest being 2 to 24 and 28 to 48 Calthorpe Street to the north of Phoenix Place and 47 to 57 Mount Pleasant to the south of the Phoenix Place site; all are Grade II listed buildings.

1.18. The Site is located within a number of protected vistas, as defined by the London View Management Framework Supplementary Planning Document[2] (SPD). The Phoenix Place site and part of the Calthorpe Street site are located in the Parliament Hill to St Paul's protected vistas, whilst part of the Calthorpe Street site is also located with the Kenwood to St Paul's Strategic protected vistas.

1.19. The Site straddles the administrative boundaries of LBI and LBC, with the Calthorpe Street site within the administrative area of LBI and the Phoenix Place site within the administrative area of LBC. In the emerging Site Allocations Plan[3], which has been submitted to the Secretary of State for independent examination, LBC identifies the Phoenix Place site for a residential-led mixed-use development. Similarly, LBI has identified the Calthorpe Street site as an opportunity for mixed use development in the adopted Core Strategy[4] and the emerging Finsbury Local Plan[5]. Both LBI and LBC have adopted the Mount Pleasant Supplementary Planning Document (SPD)[6] which covers the Site and the Mount Pleasant Sorting Office to the south-east of the Site. The SPD sets out the planning framework for the redevelopment of the Site including a number of objectives which reflect planning policies and Site-specific design issues.

1.20. The Site is identified in the London Plan[7] (see Policy 2.13) as being within an Opportunity Area for intensification, where there is significant capacity to accommodate new housing, commercial and other development on brownfield land which can be supported by Crossrail and the Thameslink programme at Farringdon Station, which is located approximately 580m south-east of the Site. The Site is also located within the Central Activities Zone, which is defined by the London Plan as an area with a very high concentration of metropolitan activities such as retail, financial and other commercial activities. Finance, specialist retail, tourist and cultural activities are promoted within the Central Activities Zone.

1.21. A detailed description of the Site and its surroundings is provided in Chapter 3: *Existing and Future Land Uses*.

Nature of the Applications

1.22. Two applications have been submitted in detail to LBI and LBC as appropriate for determination. The suite of applications is described below.

1.23. The Calthorpe Street Development (which includes the Enabling Works on Calthorpe Street site) and Phoenix Place Development are defined by the drawings submitted as part of the applications for planning permission. These drawings, together with the description of the Calthorpe Street Development and Phoenix Place Development provided in Chapter 5: *The Proposed Development*, form the basis of the EIA for the three Development Scenarios. A selection of the drawings used to inform the EIA are presented in Volume 2: *Figures*.

1.24. The Applicant is seeking to obtain detailed planning permission for a residential-led mixed-use development comprising retail, office and community uses with associated public and private realm, landscaping, associated parking and highways improvements. The descriptions of the planning applications are given below.

Calthorpe Street and Enabling Works Planning Application

1.25. The Calthorpe Street planning application, which has been submitted to LBI for determination, is described as:

Comprehensive redevelopment of the site following the demolition of existing buildings and structures to construct six new buildings ranging from 3 to 12 storeys in height to provide 38,015 sqm (GIA) of residential floorspace (Class C3), 4,260 sqm (GIA) of office floorspace (Class B1), 1,428 sqm (GIA) of flexible retail and community floorspace, (Classes A1, A2, A3, D1 and D2), with associated energy centre, waste and storage areas, vehicle and cycle parking, hard and soft landscaping to provide public and private areas of open space, alterations to the public highway and construction of a new dedicated vehicle ramp to basement level to service Royal Mail operations, construction of an acoustic roof deck over the existing servicing yard and all other necessary excavation and enabling works.

Phoenix Place Planning Application

1.26. The Phoenix Place planning application, which has been submitted to LBI for determination, is described as:

Comprehensive redevelopment of the site following the demolition of existing buildings to construct four new buildings ranging from 6 to 15 storeys in height to provide 38,723 sqm (GIA) of residential floorspace (Class C3), 822 sqm (GIA) of flexible retail and community floorspace (Use Classes A1, A2, A3, D1 and D2), with associated energy centre, waste and storage areas, vehicle and cycle parking (including the re-provision of Royal Mail staff parking), hard and soft landscaping to provide public and private areas of open space, alterations to the public highway and all other necessary excavation and enabling works.

Development Scenarios

1.27. There are three likely Development Scenarios for redeveloping the Site. The Enabling Works would likely only be undertaken as part of the redevelopment of the Calthorpe Street site. Therefore, for the purposes of the EIA, the Enabling Works are considered within Development Scenarios 1 and 2 but not part of Development Scenario 3, which could proceed without the Enabling Works on the Calthorpe Street site.

Documents for Approval

1.28. The following documents have been submitted to LBI and LBC for approval pursuant to the planning applications:

- Planning Application forms, Certificate of Ownership and Notices;
- Schedule of existing and proposed areas.
- Conservation Area Consent Application forms and drawings; and
- Plans and drawings including site plans, floor plans, elevations and sections.

Documents Accompanying the Planning Applications

1.29. The following documents accompany the planning applications:

- Design and Access Statement;
- Planning Statement;
- Housing Statement;
- Statement of Community Involvement;
- Play Space Strategy;
- Sustainability Statement;
- Energy Strategy;
- Tall Buildings Justification;
- Daylight, Sunlight and Overshadowing Assessment;
- Health Impact Assessment;
- Residential Travel Plan;
- Framework Travel Plan - Calthorpe Street;
- Framework Travel Plan - Phoenix Place;
- Operational Waste Plan - Calthorpe Street;
- Operational Waste Plan - Phoenix Place;
- Delivery and Servicing Plan;
- Framework Construction Logistics Plan;
- Parking Management Plan;
- Environmental Statement (Volume 1 to Volume 4);
- Tree Survey (included in Volume 4 of this ES);
- Ecological Appraisal (included in Volume 4 of this ES);
- Transport Assessment (included in Volume 4 of this ES); and
- Flood Risk Assessment (included in Volume 4 of this ES).

1.30. The above documents cover and accompany all the planning applications for both the Calthorpe Street Development and the Phoenix Place Development.

Format of the Environmental Statement

1.31. The ES comprises four separate volumes:

- Volume 1: *Main Text*;
- Volume 2: *Figures*;
- Volume 3: *Townscape, Visual and Built Heritage Assessment*; and
- Volume 4: *Appendices*.

1.32. A *Non-Technical Summary* (NTS) of the ES was also prepared and is presented as a standalone document.

1.33. The content of each volume of the ES is summarised below.

Volume 1: Main Text

1.34. The main text, together with Volumes 2 to 4, presents the full ES. The EIA Regulations state that an ES should contain such information referred to in Part 1 of Schedule 4 as is:

"*…reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile*".

1.35. Table 2.1 in Chapter 2: *EIA Methodology* lists the information referred to in Part 1 of Schedule 4 to the EIA Regulations, together with the relevant chapter references indicating where such information is provided within this ES.

Volume 2: Figures

1.36. Volume 2 comprises a set of figures and illustrations in support of the main text of the ES (Volume 1), together with a selection of detailed planning application drawings that were assessed. Therefore, Volumes 1: *Main Text* and Volume 2: *Figures* should be read in conjunction with one another.

Volume 3: Townscape, Visual and Built Heritage Assessment

1.37. A Townscape, Visual and Built Heritage Assessment was prepared by Professor Robert Tavernor Consultancy as a separate document and is presented in Volume 3. Although separate from Volume 1: *Main Text*, the assessment described in Volume 3: *Townscape, Visual and Built Heritage Assessment* forms an integral part of the EIA reported in the ES.

Volume 4: Appendices

1.38. A series of appendices have been prepared to supplement Volume 1: *Main Text*; numbered to accord with the numbering of the corresponding chapter. Owing to their size, the appendices have been split into four sections (Volumes 4A to 4D).

1.39. Volume 4A comprises the following appendices:

- Appendix 2.1: EIA Scoping Report;
- Appendix 2.2: EIA Scoping Opinions, Subsequent Clarifications and Consultation Responses;
- Appendix 2.3: Ecological Appraisal;
- Appendix 3.1: Tree Survey;
- Appendix 11.1: Air Quality Monitoring Study; and

- Appendix 11.2: Air Quality Modelling Study.

1.40. Volume 4B and Volume 4C comprises the following appendices:

- Appendix 9.1: Transport Assessment.

1.41. Volume 4D comprises the following appendices:

- Appendix 12.1: Buried Heritage (Archaeology) Desk - Based Assessment;
- Appendix 14.1: Flood Risk Assessment;
- Appendix 15.1: Wind Tunnel Testing: Wind Microclimate Study; and
- Appendix 17.1: Cumulative Schemes.

1.42. Volume 4E comprises the following appendices:

- Appendix 13.1 Preliminary Environmental Risk Assessment; and
- Appendix 13.2 Desk-Based Explosive Threat Assessment.

1.43. Volume 4F comprises the following appendices:

- Appendix 16.1: Principles of Daylight and Sunlight and Institute of Lighting Engineers Guidelines; and
- Appendix 16.2: Drawings of Assumed Future Baseline, Development Scenarios and Cumulative Scenario.

1.44. Volume 4G comprises the following appendices:

- Appendix 16.3: Detailed Analysis Results of the Daylight and Sunlight Amenity within the surrounding residential properties for each of the Development Scenarios.
- Appendix 16.4: Detailed Analysis Results of the Hours in Sun Overshadowing Assessment; and
- Appendix 16.5: Detailed Analysis Results of the Transient Overshadowing Assessments.

Environmental Statement Non-Technical Summary

1.45. The purpose of the NTS is to provide a balanced summary of the ES without excessive technical detail.

Professional Team

1.46. The EIA was co-ordinated by Waterman Energy, Environment & Design Ltd (Waterman EED). This ES presents the methodologies used for and the results of the EIA, which was undertaken by a number of specialist designers and consultants. These designers and consultants are listed in Table 1.1, together with their respective disciplines and contribution to the EIA.

Table 1.1: Environmental Impact Assessment and Design Team

Role/EIA Input	Organisation
Applicant	Royal Mail Group Ltd
Project Manager	M3 Consulting
Calthorpe Street site Architect (Plot C1)	Allies and Morrison
Calthorpe Street site Architect (Plot C2)	Wilkinson Eyre Architects
Phoenix Place site Architect (Plot P1)	Alford Hall Monaghan Morris
Phoenix Place site Architect (Plot P2)	Feilden Clegg Bradley Studios
Landscape Architect	Camlins
Planning Consultant	DP9
Services Engineer	Hoare Lea
Sustainability Consultant	Hoare Lea
Structural / Drainage Engineer	Halcrow Yolles
Construction Advisor	Mace
Cost Consultant	Davis Langdon
Transport Consultant	SKM Colin Buchanan
Townscape and Built Heritage Consultant	Professor Robert Tavernor Consultancy
Accurate Visual Representations	Cityscape
Flood Risk	Waterman Transport & Development (Waterman T&D)
Socio-Economics Consultant	Volterra
Wind Consultant	RDWI Anemos
Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare Consultants	Gordon Ingram Associates
Air Quality Consultant	Waterman EED
Noise Consultant	Hoare Lea
Archaeology Consultant	Waterman EED
Waste Consultant	Waterman EED / SKM Colin Buchanan
Ground Contamination Consultant	Waterman EED

Environmental Statement Availability and Comments

1.47. Additional hard copies of the ES (Volumes 1 to 4) can be purchased from Waterman EED on request. CD versions of the ES are available for purchase at £25. Copies of the NTS can be obtained free of charge. All documents are available from:

Waterman Energy, Environment & Design Ltd
Pickfords Wharf
Clink Street
London
SE1 9DG

Tel: 020 7928 7888

email: eed@watermangroup.com

1.48. Copies of the planning application and ES are also available for viewing in the Planning Departments of LBI and LBC during normal office opening hours. Comments on the applications should be forwarded to the addresses below:

London Borough of Islington
Planning and Development
22 Upper Street
London
N1 1YA

London Borough of Camden
Department of Planning
Camden Town Hall Extension
Argyle Street
London
WC1H 8EQ

References

1 HMSO, 2011, Statutory Instrument 2011 No. 1824 - Town and Country Planning (Environmental Impact Assessment) Regulations 2011.

2 The Mayor of London, 2010, London View Management Framework – The London Plan Supplementary Planning Guidance.

3 London Borough of Camden, 2012, Camden Site Allocation, Local Development Framework, Proposed Submission Document, March 2012.

4 London Borough of Islington, 2011, Adopted Core Strategy, February 2011.

5 London Borough of Islington, 2012, Finsbury Local Plan, Area Action Plan for Bunhill and Clerkenwell Submission, June 2012.

6 London Borough of Camden, London Borough of Islington, 2011, Mount Pleasant Supplementary Planning Document, October 2011.

7 Greater London Authority, 2011, The London Plan: Spatial Development Strategy for Greater London, July 2011.

2. EIA Methodology

2.1. This Chapter sets out the general approach to, and methodology adopted for, the EIA. In particular, consideration is given to the process of scoping the EIA and the legislative framework within which the EIA was undertaken. Consideration is also given to the general approach and methods used to identify the likely significant effects of the three Development Scenarios outlined later in this Chapter. The generic criteria adopted to assess the significance of the likely effects are described, together with the general structure of the technical Chapters of this Environmental Statement (ES).

2.2. For a detailed description of the assessment methodologies and the specific significance criteria relating to each technical assessment, reference should be made to Chapters 7 to 16 inclusive and to Volume 3: *Townscape, Visual and Built Heritage Assessment*.

General Approach

2.3. This ES was prepared in accordance to The Town and Country Planning (Environmental Impact Assessment) Regulations 2011[1] (hereafter referred to as the 'EIA Regulations'). Reference was also made to current good practice guidance in EIA including:

- Amended Circular on Environmental Impact Assessment – A Consultation Paper (2006)[2];
- Environmental Impact Assessment: A Guide to Good Practice and Procedures. A Consultation Paper (2006)[3];
- Environmental Impact Assessment - A Guide to Procedures, Department of the Environment, Transport and Regions (DETR) (2000)[4];
- Circular 02/99 - Environmental Impact Assessment, DETR (1999)[5]; and
- Impact Assessment Guidelines and ES Review Criteria from the Institute of Environmental Management and Assessment (IEMA) (2004)[6].

2.4. The EIA identifies the likely significant environmental effects of each of the three Development Scenarios; details of the approach to the assessment of the Development Scenarios are provided later in this Chapter. Based on the findings of the various studies undertaken as part of the EIA, methods of avoiding, reducing or off-setting any potentially significant adverse effects (collectively known as 'mitigation measures') were developed. These mitigation measures are set out in each of Chapters 7 to 16, where relevant.

2.5. The likely significant effects to be addressed within the EIA, together with the general approach to the assessment of the Development Scenarios were agreed as part of the Scoping process; details of which are provided later in this Chapter.

2.6. Detailed technical studies were on-going throughout the design process, providing information about environmental issues and constraints that had the potential to affect all three Development Scenarios. The EIA comprised an assessment of both the likely significant beneficial and adverse environmental effects arising during both the demolition and construction phases of the three Development Scenarios and once they are completed and operational. In line with legislative requirements and best practice, the likely nature and significance of direct, indirect, secondary and cumulative short, medium and long-term, permanent and temporary, beneficial and adverse effects were identified, where applicable. The approach taken in the assessment of likely significant cumulative effects is summarised later in this Chapter.

Establishing Baseline Conditions

Background

2.7. At the time of undertaking the EIA, Mount Pleasant Sorting Office located to the south-east of the Site and adjoining the south-eastern boundary of the Calthorpe Street site was being refurbished and modernised by the Applicant as part of the wider consolidation of its operations across London. A number of planning applications have been submitted by the Applicant to LBI for determination (see Table 2.1 for details). Internal modernisation works to the adjacent Mount Pleasant Sorting Office are being undertaken under permitted development rights. The modernisation of the Mount Pleasant Sorting Office is expected to be completed by the end of 2013. Following consolidation and modernisation, the delivery / service yard and staff car park of the Mount Pleasant Sorting Office, which are known as the Calthorpe Street site and the Phoenix Place site respectively, will become available for redevelopment.

2.8. For the purposes of identifying the likely significant effects of a development, the baseline condition is the datum against which the assessment of likely changes (i.e. likely environmental effects) arising from construction or operational use of a development is made. These are generally taken to be the environmental characteristics of a development site (in terms of air quality, noise, geology, etc.) and its environs that exist immediately prior to construction of a new development. For many brownfield sites, the EIA baseline would therefore normally be the conditions that exist at the time the baseline studies were undertaken, or for which the latest data are available. However, because the Applicant is in the process of modernising the Mount Pleasant Sorting Office in order to consolidate its operations across London, the existing conditions of the Site are not considered an appropriate baseline.

2.9. Whilst the entire EIA could have been based on the existing conditions of the Site and surrounding area (i.e. those pertaining at the time the EIA was carried out) for many topics these would not be representative of the conditions that would exist immediately prior to the development commencing on the Site. Owing to the on-going changes to conditions on the Site and in the surrounding area (in relation to the modernisation of the adjacent Mount Pleasant Sorting Office), together with the Applicant's commitment to completing the Mount Pleasant Sorting Office modernisation works prior to redeveloping either the Calthorpe Street site and / or the Phoenix Place site, the existing conditions are not considered an appropriate datum against which to assess the environmental effects of the redevelopment proposals. Therefore, the assessments of the likely significant effects of the three Development Scenarios presented in this ES are based on the likely future baseline conditions of the Site and surrounding area. The approach to establishing the likely future baseline conditions, together with the principal assumptions made for the purposes of undertaking the EIA, are set out later in this Chapter.

2.10. It should be noted that in the case of noise (namely traffic generated noise) and air quality, the effects of the Development Scenarios are assessed using a comparison between 'with Development' and 'without Development' situations for the anticipated opening year, in accordance with standard practice. In this regard, quantification of a future baseline year is un-necessary and has not been undertaken for these specific issues. Further details regarding the methodologies employed are provided in Chapters 10 and 11 of this ES.

Existing Baseline Conditions

2.11. Whilst the EIA of the three Development Scenarios presented in the ES is based solely on the likely future baseline conditions of the Site and surrounding area, the existing conditions relevant to the particular assessment were initially identified to assist in establishing the likely future baseline conditions. The existing conditions of the Site and surrounding area were established through monitoring and walkover surveys, consultation with relevant authorities and data obtained from third parties. As the assessments are based solely on the likely future baseline conditions, the existing conditions of the Site and surrounding area are described only in Chapter 3: *Existing and Future Land Uses*, to provide context and for the purposes of describing the principal differences (where they exist) between the existing and likely future baseline conditions. In each technical Chapter of the ES and Volume 3: *Townscape, Visual and Built Heritage Assessment*, only the likely future baseline conditions are described. However, for some of the assessments where the modernisation of the Mount Pleasant Sorting Office does not affect the assessments (such as archaeology and socio-economics), the likely future baseline conditions are the same as the existing conditions. In all cases, any deviation from the approach to the future baseline described above is clearly stated in the technical Chapter.

Future Baseline Conditions

2.12. As described above, the Applicant is currently rationalising mail processing operations across London, which involves the refurbishment and modernisation of the Mount Pleasant Sorting Office adjoining the south-eastern boundary of the Calthorpe Street site. The Applicant has submitted a number of applications to LBI seeking permission to undertake external alterations to the Mount Pleasant Sorting Office, which are detailed in Table 2.1, together with the status of permission and the work undertaken at the time of undertaking the EIA. Further internal alterations and modernisation works undertaken within the Mount Pleasant Sorting Office are being undertaken under permitted development rights. The Applicant is committed to undertaking these modernisation works prior to the redevelopment of the Site to allow for the continued operation of the Mount Pleasant Sorting Office.

Table 2.1: Applications Submitted to London Borough of Islington for the Modernisation of Mount Pleasant Sorting Office

Proposal	Application Reference	Status
Installation of shop front on the western elevation of the Letter Office Building, to relocate the 'callers office'. Installation of canopy over east dock at lower ground floor level. Installation of window within existing door opening as part of improved layout to reception area.	P110624	Approved 17.05.11. Works on the site complete.
Installation of replacement windows and louvres. Windows non-material amendment for minor changes during the course of construction.	P120287 P120287(MA01)	Approved 17.04.12. Works on-going. Decision pending.
Erection of single storey reception building fronting Farringdon Road and erection of fourth floor level extension to public office building to house a lift over run.	P121232	Approved 16.08.12.
Advertisement Consent application for Royal Mail logos and 'Mount Pleasant' lettering on the Public Office Building.	P120691	Approved 22.05.12. Works on-going.
Advertisement Consent application for lettering on the south-east facade of the Letter Office Building.	P121435	Approved 28.08.12. Works on-going.
External alterations to the existing ground floor elevation of the Public Office Building to create a new shop front for the Post Office.	P121894	Approved 18.10.12.
Relocation of the Royal Mail Rathbone Place War Memorial within the south façade.	P122427	Approved 28.12.12.
External refurbishment of the Phoenix Place façade of the Letter Office Building.	P122295	Approved 12.12.12.
Public Office Building and Letter Office Building roof plant changes.	P2013/1135/FUL	Submitted 10.04.2013. Decision Pending.

2.13. The modernisation and refurbishment of the adjacent Mount Pleasant Sorting Office will result in the intensification of operations and the relocation of the international distribution operations elsewhere offsite. It is expected that works associated with the refurbishment of the Mount Pleasant Sorting Office, including the relocation of international distribution operations, will be completed by the end of 2013. Consequently, the Mount Pleasant Sorting Office works and any associated intensification of operations (such as an increased number of vehicle movements), form part of the likely future baseline conditions on and surrounding the Site. For the purposes of the EIA, it is assumed that there would be no other significant changes (apart from the cumulative schemes listed in Chapter 17: *Cumulative Effects*) to the land uses surrounding the Site.

2.14. Whilst separate permission was granted by LBI in June 2012 to relocate the British Postal Museum and Archive (BPMA) from the Mount Pleasant Sorting Office to Calthorpe House, 15 to 20 Phoenix Place, located immediately to the north of the Phoenix Place site, the development programme for the new BPMA is outside the Applicant's control. For this reason the new BPMA is considered as a cumulative scheme (see details later in this Chapter) rather than as part of the future baseline conditions.

2.15. The proposed modernisation and refurbishment of the Mount Pleasant Sorting Office and thus its future operations are defined by the planning applications set out in Table 2.1. Where applications have not yet been submitted to LBI or works are being carried out under permitted development rights, information provided by the Applicant was used to establish the likely future baseline conditions of the Mount Pleasant Sorting Office. The modernisation of the Mount Pleasant Sorting Office is described in Chapter 3: *Existing and Future Land Uses*.

2.16. Alongside the existing environmental conditions, an overview of the likely future baseline conditions of the Site and surrounding area is presented in Chapter 3: *Existing and Future Land Uses*. The principal differences between the existing and likely future baseline conditions are also set out in this Chapter. However, because the EIA was based on the likely future baseline conditions of the Site and surrounding area, the conditions presented in each of the technical Chapters are the likely future baseline conditions relevant to that particular assessment. For those assessments that are based on modelling (wind, townscape, visual and built heritage and daylight, sunlight and overshadowing), the future baseline conditions were modelled and a quantitative description provided. For the more qualitative assessments of this EIA such as archaeology, socio-economics and waste management, a qualitative description of the likely future baseline conditions is provided.

Assessment of Development Scenarios and Likely Significant Effects

2.17. As set out in Chapter 1: *Introduction*, a suite of planning applications has been submitted to LBI and LBC as appropriate for determination. Whilst the Applicant proposes the comprehensive redevelopment of the Site, it is possible that either the Calthorpe Street site or the Phoenix Place site could be developed in isolation. To facilitate the redevelopment of the Calthorpe Street site and allow for the continual 24 hour operations of the adjacent Mount Pleasant Sorting Office, the Enabling Works would be undertaken as the first phase of redeveloping the Calthorpe Street site. Consequently, the likely Development Scenarios for the Site are as follows;

- Development Scenario 1: the Entire Development (i.e. Calthorpe Street Development (which include the Enabling Works) and Phoenix Place Development);
- Development Scenario 2: Calthorpe Street Development (which include the Enabling Works); and
- Development Scenario 3: Phoenix Place Development.

2.18. Since the Enabling Works would be undertaken as the first phase of redeveloping the Calthorpe Street site, the Enabling Works are considered within Development Scenarios 1 and 2 but not part of Development Scenario 3, which could proceed without the Enabling Works being undertaken on the Calthorpe Street site. A description of the Calthorpe Street Development and the Phoenix Place Development are described in Chapter 5: *The Proposed Development.*

2.19. Chapters 7 to Chapter 16 inclusive and Volume 3: *Townscape, Visual and Built Heritage Assessment* present assessments of the likely significant effects of all three Development Scenarios against the likely future baseline conditions. The likely significant effects are identified for the demolition and construction works and for completed and operational Development Scenarios.

2.20. Where possible, the likely significant effects of each Development Scenario are quantified. Where this is not possible, a qualitative assessment is provided using professional judgement and experience. Where professional judgement and experience were used, or where uncertainty exists, this is noted in the relevant Chapter. Where the likely significant effects are the same for a number of Development Scenarios, this is also stated in the relevant Chapters.

Assessment of Development Scenarios and Cumulative Schemes

2.21. The EIA Regulations also require the likely significant cumulative effects of a development to be assessed. Effects that result from incremental changes caused by other present or reasonably foreseeable development schemes, in combination with those arising from the scheme, are known as 'cumulative effects'. There are two types of cumulative effect:

- **Type 1 Effects**: combination of individual effects resulting from the Development Scenarios, for example noise, dust and visual intrusion, on a set of defined sensitive receptors; and
- **Type 2 Effects**: combined effects arising from another development(s), which individually may be insignificant, but when assessed in combination with effects arising from the Development Scenarios, could create a significant cumulative effect.

2.22. Type 1 Effects described above were assessed qualitatively using professional judgement and the findings of all the technical assessments (Chapter 7 to Chapter 16 inclusive and Volume 3: *Townscape, Visual and Built Heritage*). With respect to Type 2 Effects, the assessments were quantified, where possible. Where this was not possible, a qualitative assessment was carried out using professional judgement and experience.

2.23. To determine which permitted and 'reasonably foreseeable' schemes have the potential to give rise to significant cumulative effects in combination with the three Development Scenarios, a review of planning applications and emerging proposals was undertaken by DP9. In agreement with LBI and LBC, the following cumulative schemes were considered as part of the EIA:

- Site of former Charter House (also known as Caxton House) 2 Farringdon Road and Units 501-521 London Central Markets, Gate 30, 45 Charterhouse Street, London, EC1M 3HP (planning application reference: P120484);
- Farringdon Station (Crossrail) / Thames link at Farringdon Station (planning application references: 09/00412/XRAIL, 10/00626/XRAIL and P/11/1453);
- 29 to 39 Mount Pleasant and 5 Rosebery Avenue (planning application references: P121605 and P121606); and
- BPMA, Calthorpe House, 15 to 20 Phoenix Place (planning application references: 2012/1897/P).

2.24. Because the modernisation of the adjacent Mount Pleasant Sorting Office will be completed before any development on the Site is started, the associated changes are taken into account in the future baseline conditions of the Site and surrounding area, and thus form the basis of the EIA. Accordingly, the on-going Mount Pleasant Sorting Office modernisation works were not considered as a 'cumulative scheme'.

2.25. For the purposes of the cumulative assessment, the above four cumulative schemes were modelled and quantitatively assessed, where possible, with Development Scenario 1 (i.e. the Entire Development across both the Calthorpe Street site and the Phoenix Place site). However, for the cumulative assessment with Development Scenario 2 (Calthorpe Street Development) and Development Scenario 3 (Phoenix Place Development), the results of the Development Scenario 1 cumulative assessment were used and extrapolated to identify and assess qualitatively (using professional judgement and experience) the likely significant cumulative effects associated with Development Scenarios 2 and 3. Exceptions to this approach are the air quality and noise assessments, which are inextricably linked to the traffic assessment; where trips assigned to the cumulative schemes, were already included within the traffic data used for the assessment of each Development Scenario.

Evaluation of Significance of Effects

2.26. The nature and significance of the likely environmental effects of the three Development Scenarios were assessed with reference to definitive standards and legislation, where available. The significance of the likely effects was assessed with reference to bespoke criteria for each environmental topic. These criteria apply a common EIA approach in order to classify the likely effects according to whether they are substantial, moderate or minor, and whether they are adverse or beneficial.

2.27. Specific criteria for each environmental topic were developed, having due regard to the following factors:

- Extent, magnitude and reversibility of the likely effect;
- Duration of the effect (whether short, medium or long-term);
- Nature of the effect (whether direct or indirect, reversible or irreversible);
- Whether the effect occurs in isolation, is cumulative or interactive;
- Performance against environmental quality standards or other relevant pollution control thresholds;
- Sensitivity of the receptor; and
- Compatibility with environmental policies.

2.28. For issues where definitive quality standards do not exist, the significance criteria was based on the:

- Local, district, regional or national scale of value of the resource affected;
- Number of receptors affected;
- Sensitivity of the receptors affected; and
- Duration of the likely effect.

2.29. In order to provide a consistent approach to expressing the outcomes of the various assessments undertaken as part of the EIA, and thereby enable comparison between likely significant effects on different environmental resources or receptors, the following terminology is used throughout the ES. The likely significant effects are expressed as:

- adverse: detrimental or negative effects on an environmental resource or receptor;
- negligible: no significant effects on an environmental resource or receptor; and
- beneficial: advantageous or positive effects on an environmental resource or receptor.

2.30. Where adverse or beneficial effects were identified, these were assessed against the following scale:

- minor: slight, very short or highly localised effects;
- moderate: limited effects (by extent, duration or magnitude) which may be considered significant; and
- substantial: considerable effects (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

2.31. For the townscape, visual and built heritage assessment the likely effects are expressed differently to those described above. The method used to assess the likely significant townscape, visual and built heritage effects is described in Volume 3.

2.32. Each of the technical Chapters sets out the relevant significance criteria, including sources and justifications, for quantifying the different levels of effect. Where possible, this is based on quantitative and accepted criteria (for example, air quality standards contained in the National Air Quality Strategy[7] and noise assessment guidelines set out and guidelines provided by the World Health Organisation[8] and BS 8233:1999[9]). Elsewhere, value judgements and expert interpretations are used to establish to what extent a predicted effect would be environmentally significant.

2.33. In the context of the assessments of the three Development Scenarios, short to medium term effects are those associated with the demolition and construction works, and long-term effects are those associated with the three Development Scenarios once completed and operational. Local effects are those affecting receptors within and close to the Site, whilst effects on receptors within the wider LBC or LBI administrative areas are assessed at a district level. Sub-regional effects are those affecting adjacent Boroughs, whilst effects on Greater London are assessed at a regional level. Effects on different parts of the country, or England as a whole, are considered to be at a national level. Effects traversing national boundaries are considered at an international level.

Location of Information in the Environmental Statement

2.34. The EIA Regulations state that an ES must include information identified in Part 1 of Schedule 4; that is:

"*(a)…reasonably required to assess the environmental effects of the development and which the applicant can, having regard in particular to current knowledge and methods of assessment, reasonably be required to compile but (b) that includes at least the information referred to in Part 2 of Schedule 4*".

2.35. The list of information referred to in Part 1 of Schedule 4 of the EIA Regulations, together with the relevant Chapter references indicating where such information is provided within the ES, is set out in Table 2.2.

Table 2.2: Location of Information within the Environmental Statement

	Specified Information	Location within Environmental Statement
1	Description of the development, including in particular:	
(a)	A description of the physical characteristics of the whole development and the land-use requirements during the construction and operational phases.	Chapter 5: *The Proposed Development* Chapter 6: *Development Programme, Demolition and Construction*
(b)	A description of the main characteristics of the production processes, for instance, nature and quantity of materials used.	Chapter 6: *Development Programme, Demolition and Construction* Chapter 7: *Waste Management*
(c)	An estimate, by type and quantity, of expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development. A description of the forecasting methods used to assess the effects on the environment.	Chapter 7: *Waste Management* Chapter 10: *Noise and Vibration* Chapter 11: *Air Quality* Chapter 13: *Ground Conditions and Contamination* Chapter 16*: Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare*
2	An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for his choice, taking into account the environmental effects.	Chapter 4: *Alternatives and Design Evolution*
3	A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and inter-relationship between the above factors.	Chapter 3: *Existing and Future Land Uses* All technical Chapters (Chapters 7 to 16) Chapter 17: *Cumulative Effects* Volume 3: *Townscape, Visual and Built Heritage Assessment*
4	A description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:	
(a)	The existence of the development;	All technical Chapters (Chapter 7 to 16) Chapter 17: *Cumulative Effects* Chapter 18: *Likely Residual Effects* Volume 3: *Townscape, Visual and Built Heritage Assessment*
(b)	The use of natural resources;	Chapter 5: *The Proposed Development* Chapter 6: *Development Programme, Demolition and Construction* Chapter 7: *Waste Management*

	Specified Information	Location within Environmental Statement
(c)	The emission of pollutants, the creation of nuisances and the elimination of waste.	Chapter 5: *The Proposed Development* Chapter 6: *Development Programme, Demolition and Construction* Chapter 7: *Waste Management* Chapter 10: *Noise and Vibration* Chapter 11: *Air Quality* Chapter 13: *Ground Conditions and Contamination* Chapter 16: *Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare* Chapter 17: *Cumulative Effects*
5	A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.	All technical Chapters (Chapters 7 to 16) Volume 3: *Townscape, Visual and Built Heritage Assessment*
6	A non-technical summary of the information provided under paragraphs 1 to 5 of this Part.	Non-Technical Summary (separate document)
7	An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.	Chapter 2: *EIA Methodology* All technical Chapters (Chapters 7 to 16) where appropriate.

Scoping the Environmental Impact Assessment

2.36. 'Scoping' is an important stage of the EIA process, and involves focusing the study (and hence the ES) on those issues of greatest likely significance. Scoping is also important in identifying the potentially significant effects associated with the demolition and construction works and the completed development, thereby ensuring that appropriate mitigation options and environmental management controls are considered.

2.37. An EIA Scoping Report setting out the general approach to the EIA and the potential effects to be addressed in the EIA was prepared by Waterman Energy, Environment & Design Ltd (Waterman EED). The key environmental effects set out in the EIA Scoping Report were identified through a review of available up to date baseline information, including survey information, together with preliminary information about the design of the Development Scenarios. The EIA Scoping Report (a copy of which is provided in Appendix 2.1) was submitted to LBI and LBC on the 29 October 2012, together with requests for formal Scoping Opinions under Regulation 13 of the EIA Regulations. This provided LBI, LBC and statutory consultees with the opportunity to comment on the content and methodologies to be used for the EIA. A Scoping Opinion was received from LBI on the 10 December 2012 and a separate Scoping Opinion was received from the LBC on the 8 January 2013 (copies of which are presented in Appendix 2.2). In response to issues raised in the EIA Scoping Opinions, Waterman EED issued a Memorandum to LBI and LBC providing clarification and revisions to the proposed baseline, approach and scope of the EIA on the 15 January 2013. A copy of the Memorandum is also presented in Appendix 2.2. A response to the Memorandum was received from LBC on the 14 February 2013; a copy of which is provided in Appendix 2.2.

2.38. Based on the EIA Scoping Report, Scoping Opinion and subsequent discussions with LBI and LBC (Memorandum), it was agreed that the EIA would cover the following topics:

- Waste;
- Socio-economics;
- Transportation and Access;
- Noise and Vibration;
- Air Quality;
- Archaeology;
- Ground Conditions and Contamination;
- Water Resources and Flood Risk;
- Wind;
- Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare;
- Townscape, Visual and Built Heritage; and
- Cumulative Effects.

2.39. It was agreed with LBI and LBC through the Scoping process that the following topics could be scoped out of the EIA:

- Ecology: an ecological appraisal was carried out for the Site in September 2012. Based on the Extended Phase 1 Habitat Survey, the habitats on the Site are considered to be of negligible ecological value, with the exception of trees, which are considered to be of ecological value within the Site only. Therefore, the habitats on the Site are considered to have a negligible potential to support amphibians, badgers, bats, invertebrates or other protected or notable species, although the trees were considered to have some potential to support common bird species. Measures are set out in the Ecological Appraisal (see Appendix 2.3) to minimise disturbance to birds during the demolition and construction works;

- Internal Daylight, Sunlight and Overshadowing: the analysis of the internal daylight and sunlight levels within the proposed residential accommodation, together with the analysis of overshadowing (sun on the ground) of the proposed public and communal outdoor amenity spaces within the Site will focus on demonstrating whether acceptable levels are achieved within the development itself because no baseline conditions currently exist. Therefore the internal daylight, sunlight and overshadowing analysis is presented separately from the ES as a standalone report; and
- Energy, Sustainability and Climate Change: whilst a summary of the sustainability features, including measures to minimise energy consumption would be set out in Chapter 5: *The Proposed Development*, energy consumption and carbon dioxide emissions (which are indirectly related to the urban heat island effect) will be considered within the Sustainable Design and Construction Statement that accompany the planning applications.

2.40. During the EIA scoping process, LBC and LBI requested that a Health Impact Assessment should be undertaken as part of the EIA. Therefore a Health Impact Assessment was undertaken but is presented outside of the ES as a standalone document that accompanies the planning applications.

Consultation Process

2.41. Key stakeholders were consulted at various stages throughout the design and EIA process. The following statutory and non-statutory organisations were consulted with regard to the methodologies of the EIA and the likely significant environmental effects of the Development Scenarios:

- LBI;
- LBC;
- Greater London Authority (GLA);
- Transport for London (TfL);
- Thames Water;
- English Heritage;
- Environment Agency;
- Natural England; and
- Local interest groups and residents.

2.42. Copies of consultation responses received directly by the EIA consultancy team in addition to those received by LBI and LBC as part of their consultation process are provided in Appendix 2.2.

2.43. Each technical Chapter sets out relevant consultation undertaken specific to the assessment under the Assessment Methodology section. All relevant comments from the consultees relating to the EIA, whether made directly to the EIA consultancy team or through the Scoping Opinion, are addressed in the relevant technical Chapters of the ES (Chapters 7 to 16 inclusive) and Volume 3: *Townscape, Visual and Built Heritage Assessment*. A summary of the comments, together with a reference to the location within the ES or other documents where the comments are addressed, is presented in Table 2.3.

Table 2.3: Issues Raised During the EIA Scoping and Consultation Process

Consultee	Issue Raised	Chapter Where Issue Addressed
LBI / LBC Case Officers	Establishing future baseline conditions. It was agreed that the EIA will be based on the likely future baseline conditions of the Site and surrounding area rather than existing conditions.	Chapter 2: *EIA Methodology* Chapter 3: *Existing and Future Land Uses* Chapter 7 to 16 inclusive Volume 3: *Townscape, Visual and Built Heritage Assessment*
	Consideration of the likely significant effects on town centres and important retail frontages.	Chapter 8: *Socio-economics*
	Consideration of additional demand on local schools, healthcare facilities and public amenity space.	Chapter 8: *Socio-economics*
	Consultation with English Heritage (Greater London Archaeology Advisory Service).	Chapter 12: *Archaeology*
	Additional cumulative scheme should be considered.	Chapter 17: *Cumulative Effects*
	Heritage Assessment should be included.	Chapter 12: *Archaeology* Volume 3: *Townscape, Visual and Built Heritage Assessment*
	Arboricultural Survey should be included in ES.	Chapter 3: *Existing and Future Land Uses*
LBI Environmental Health Officer	Noise nuisance on future residents associated with traffic generated from the adjacent Mount Pleasant Sorting Office. Consideration of noise on the Farringdon Road / Theobald's Road 'Important Area' as per the Noise Action Plan. Consideration of the noise environment to residents as a result of building material and design of spaces (such as the enclosed courtyards).	Chapter 10: *Noise and Vibration*
Environment Agency	Risk of flooding of the Site from sources other than fluvial. Surface Water Strategy should be undertaken as part of the Flood Risk Assessment and should meet Policy 13 of the London Plan.	Chapter 14: *Water Resources and Flood Risk* Appendix 14.1: *Flood Risk Assessment*
Thames Water	Consideration is given to the increased demand on potable water consumption and waste water.	Chapter 14: *Water Resources and Flood Risk*

2.44. A number of workshops and consultation meetings were held with LBI and LBC to present the proposals and allow feedback to be taken into account through the design process. Presentations were also made to the Joint Borough Development Management Forum, Amwell Society and the Finsbury Ward partnership, which was open to members of the public. A public exhibition of the initial proposals was held in 18th to 20th October 2012 and a further public exhibition was held on the 14 to 16 March 2013 providing a forum for the public to comment on the proposals. Specific details of the public consultation are set out in the Statement of Community Involvement, which accompanies the planning application. This includes: a description of the approach taken to the public consultation; the stakeholders / community groups involved; an outline of the key outcomes; and an explanation of how the outcomes were considered and addressed in the design process.

Structure of the Technical Chapters of the Environmental Statement

2.45. The EIA process assesses the likely significant environmental effects of the three Development Scenarios. Each environmental topic considered in the EIA is assigned a separate Chapter in the ES (Chapters 7 to 16 inclusive), and within each of these Chapters, the assessment is presented in the following format:

Introduction

2.46. The introduction of each Chapter provides a brief summary of the issues considered in the Chapter, confirms the author and highlights relevant appendices which accompany the Chapter.

Legislation and Planning Policy

2.47. This section includes a review of any relevant legislation, national, regional and local planning policy, published standards, guidelines and best practice. It is important to note that a full appraisal of the Development Scenarios against planning policies is provided in the Planning Statement, which accompanies the planning applications.

Assessment Methodology and Significance Criteria

2.48. The Assessment Methodology and Significance Criteria section of each Chapter sets out the methods used in establishing the likely future baseline conditions relevant to the assessment and the approach to undertaking the assessment of the three Development Scenarios. This is followed by an explanation of the significance criteria used to identify the likely environmental effects with reference to published standard guidelines, best practice. The limitations and assumptions of the assessment are also defined in this section of each Chapter. This section of each Chapter also describes the specific consultation undertaken to agree the scope or methodology of the assessment.

Future Baseline Conditions

2.49. In order to assess the likely significant effects of the three Development Scenarios, it is necessary to establish the environmental conditions that exist on and surrounding the Site, in the absence of the Development Scenarios. As outlined above, the EIA was based on the likely future baseline conditions of the Site and surrounding area, whereby it was assumed that the modernisation of the adjacent Mount Pleasant Sorting Office will be completed prior to any development on the Site is started. The likely future baseline conditions relevant to each assessment are set out in this section of each of the technical Chapters.

Likely Significant Effects

2.50. This section of each Chapter presents the assessment of the likely significant effects of the following three Development Scenarios:

- Development Scenario 1: the Entire Development (i.e. Calthorpe Street Development (which include the Enabling Works) and Phoenix Place Development);
- Development Scenario 2: Calthorpe Street Development (which include the Enabling Works); and
- Development Scenario 3: Phoenix Place Development.

2.51. The likely significant effects are identified and described for both the demolition and construction works associated with each of the Development Scenarios and once they are completed and operational. The assessments were carried out in relation to the relevant likely future baseline conditions as described in the Future Baseline Conditions section of the Chapter. An evaluation of the significance of the likely effect is provided in accordance with the criteria defined earlier in the Chapter.

Mitigation Measures

2.52. One of the principal aims of the EIA is to assist in developing mitigation measures to prevent, reduce and where possible, offset potentially significant adverse effects of a development. An iterative approach was adopted towards the design of the Development Scenarios, which evolved in parallel with the EIA process. This enabled many mitigation measures to be designed into the Development Scenarios, thereby reducing the need for further mitigation. Mitigation measures can relate to design, construction or the activities associated with the completed development. Examples include:

- **Design:** design solutions, such as the massing, position or orientation of buildings within the Site. These have predominantly been incorporated into the Proposed Development as it has evolved and are therefore described in Chapter 4: *Alternatives and Design Evolution* and Chapter 5: *The Proposed Development* and would not be considered under the Mitigation Measures section;
- **Construction:** commitment to undertake the construction works in a specific way, for example, the use of particular plant, phasing of the works, regular monitoring and implementation of Construction Environmental Management Plans (CEMP) for each Development Scenario; and
- **Completed Development:** additional measures, over and above those included within the design, which the Applicant would commit to in order to further prevent, reduce and, where possible, offset significant adverse effects of a completed development. For example, specific façade and glazing design to provide sufficient noise insulation, implementation of a Travel Plan to reduce car usage and contribution to offsite community facilities through a Section 106 Agreement.

2.53. Where potentially significant adverse environmental effects were identified, the Applicant is committed to implementing the appropriate mitigation measures as set out in the relevant technical Chapters. The Applicant has also committed to implement mitigation to enhance potentially beneficial effects, where practicable.

Likely Residual Effects

2.54. This section describes the nature and significance of the likely residual effects of the Development Scenarios, assuming the implementation of the proposed mitigation measures. The significance of the likely residual effects is identified in accordance with the criteria defined for the respective assessment.

Conclusions

2.55. This section of each Chapter provides a brief summary of the findings of the assessment in relation to the relevant environmental issue.

Structure of Townscape, Visual and Built Heritage Assessment

2.56. The Townscape, Visual and Built Heritage Assessment forms an integral part of the EIA but is presented as a separate volume of the ES (Volume 3). This assessment evaluates the likely changes to townscape quality and character as a result of the Development Scenarios and provides an assessment of their likely significant effects on key views, which were agreed with LBI and LBC, using Accurate Visual Representations. Consideration is given to the likely significant effects of the Development Scenarios on built heritage (above ground), including the setting of listed buildings and Conservation Areas.

Assumptions and Limitations

2.57. The principal assumptions that were made, and any limitations that were identified in undertaking the EIA, are set out below. Assumptions and limitations specifically relevant to each assessment are described in each technical Chapter.

- The assessments reported in the ES are based on the designs, drawings and floorspace schedules submitted as part of the planning applications;
- Where flexible Use Classes are sought, the assessments presented in this ES are, where necessary, based on the Use Class that is most likely to present a worst case assessment;
- The assessment of demolition and construction-related effects are based on the indicative demolition and construction timetable and methodologies as provided by the project team and agreed by the Applicant;
- It is assumed that information received from third parties is appropriate, complete and up to date;
- All of the principal existing land uses adjoining the Site remain substantially unaltered (i.e. the receptors remain the same), with the exception of the cumulative schemes listed above and the changes associated with the modernisation of the Mount Pleasant Sorting Office;
- The changes to the adjacent Mount Pleasant Sorting Office as a result of modernisation works are based on planning application drawings and supporting information previously submitted to LBI and information provided by the Applicant;
- Development Scenarios 1, 2, and 3 are the only possible scenarios that could be implemented. It is assumed that the Enabling Works would only be undertaken as the first phase of the Calthorpe Street Development and therefore are only considered for Development Scenario 1 and 2. It is assumed that the Phoenix Place Development could proceed without implementing the Enabling Works on the Calthorpe Street site;

- The modernisation works of the adjacent Mount Pleasant Sorting Office, as described in Chapter 3: *Existing and Future Land Uses* will be completed prior to any of the three Development Scenarios commencing;
- The design, construction and operation of any of the Development Scenarios would satisfy environmental standards consistent with contemporary legislation, practice and knowledge as a minimum, but would also strive to achieve best practice at the time of the works where, reasonable; and
- The details of the CEMPs (for each Development Scenario) would be discussed and agreed with the LBI and LBC following the granting of planning permission for any of the Development Scenarios, to control subsequent construction activities. The CEMPs would be enforced and monitored during all key stages of the demolition and the construction of any of the Development Scenarios.

References

1 The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (Statutory Instrument No. 1824).

2 Department for Communities and Local Government (DCLG) (2006) Amended Circular on Environmental Impact Assessment: A consultation paper.

3 DCLG (2006) Environmental Impact Assessment: A guide to good practice and procedures - A consultation paper.

4 DETR (2000) Environmental Impact Assessment - A Guide to Procedures, Department of the Environment, Transport and Regions (DETR).

5 DCLG (1999) Circular 02/99: Environmental impact assessment.

6 IEMA (2006) Impact Assessment Guidelines and ES Review Criteria from the Institute of Environmental Management and Assessment.

7 HMSO, Department of the Environment (1997) 'The UK National Air Quality Strategy', HMSO.

8 World Health Organisation, 1999. 'Guidelines for Community Noise'.

9 BSI, 1999. BS8233 Sound Insulation and Noise Reduction for Buildings - Code of Practice.

3. Existing and Future Land Uses

Introduction

3.1. This Chapter provides a summary of the existing and assumed future land uses and activities on the Site and in the immediate surrounding area, particularly in relation to the adjacent Mount Pleasant Sorting Office. Existing and future sensitive receptors that could be affected by the construction and / or operation of any of the Development Scenarios (as described in Chapter 5: *The Proposed Development*) are also briefly described in this Chapter. A full description of the assumed future baseline conditions of the Site and surrounding area relevant to each technical assessment undertaken as part of the EIA is provided within Chapter 7 to Chapter 16 of this Environmental Statement (ES) and in Volume 3: *Townscape, Visual and Built Heritage Assessment*.

Site Location and Setting

3.2. As described in Chapter 1: *Introduction*, the Site is centred on National Grid Reference 530987,182288 and located within central London. The location of the Site is shown in Figure 1.1 and Figure 1.2. The Site is bound by Farringdon Road to the north-east, Calthorpe Street to the north-west, Gough Street to the south-west, Mount Pleasant (road) and Mount Pleasant Sorting Office to the south and south-east respectively.

3.3. The Site forms part of, and is adjacent to, the Applicant's Mount Pleasant Sorting Office, which currently also includes the British Postal Museum and Archive (BPMA). The Site covers in total 3.53 hectares (ha) and is separated into two distinct areas. The eastern part of the Site ('Calthorpe Street site') is located within the administrative boundary of London Borough of Islington (LBI) and within the Clerkenwell ward, whilst the western part of the Site ('Phoenix Place site') is located within the administrative area of London Borough of Camden (LBC) and within the Holborn and Covent Garden ward. The Calthorpe Street site covers an area of 1.31ha, whilst the Phoenix Place site covers 2.22ha.

3.4. Topographically, the Phoenix Place site slopes down from Calthorpe Street in the north-west to Mount Pleasant in the south-east. Towards Calthorpe Street, the Phoenix Place site is at 19.44m Above Ordnance Datum (AOD); dropping to 13.98m AOD at the junction of Mount Pleasant with Phoenix Place. Within the Calthorpe Street site, the delivery and service yard comprises two levels, with upper and lower level parking and loading areas connected by ramps. The upper level at the north corner of the Calthorpe Street site (junction of Farringdon Road with Calthorpe Street) is at 18.95m AOD whilst at the southern corner of the upper level adjacent to Phoenix Place, the Calthorpe Street site is at 18.41m AOD. The lower level of the Calthorpe Street site (known as the '*Bathtub*' and located in the central part of the Calthorpe Street site) is at 14.70m AOD.

3.5. Although both the Calthorpe Street site and the Phoenix Place site are currently occupied by operations associated with the Mount Pleasant Sorting Office (Uses Classes B1 and B8), which is located immediately south of the Calthorpe Street site, the Site is located in an area dominated by residential and office uses.

3.6. The Site is identified in the London Plan[1] (see Policy 2.13) as being within an Opportunity Area for intensification, where there is significant capacity to accommodate new housing, commercial and other development on brownfield land. The Site is also located within the Central Activities Zone, which is defined by the London Plan as an area with a very high concentration of metropolitan activities such as retail, financial and other commercial activities. The Mount Pleasant Supplementary Planning Document (SPD)[2], adopted by LBI and LBC, identifies the Site as an opportunity for new housing and businesses.

Existing Land Uses on the Site

Calthorpe Street Site

3.7. As shown on Figure 3.1, the Calthorpe Street site is used 24-hours a day as a delivery and service yard for the adjacent Mount Pleasant Sorting Office, located along the south-eastern boundary. The Calthorpe Street site accommodates approximately 300 operational vehicles. The delivery and service yard comprises two levels, with upper and lower level parking and loading areas, which are connected by ramps along the north-eastern and south-western boundary of the Calthorpe Street site. The lower level (*Bathtub*) is used by the Applicant for vehicle (vans and Heavy Good Vehicles (HGV)) parking and manoeuvring articulated lorries and smaller rigid vehicles, equipment, waste and fuel storage, together with the loading and unloading of mail into the Mount Pleasant Sorting Office. The *Bathtub* extends across much of the Calthorpe Street site and provides direct access to the basement of the adjacent Mount Pleasant Sorting Office. A small single storey building, at an equivalent height to the surrounding upper level, is located in the south-eastern corner of the *Bathtub*. Loading and unloading also takes place at the upper level (ground level, known as the North Road) beneath canopies adjoining the Mount Pleasant Sorting Office. Two small single storey buildings are also located on the upper level; one a gate house and the other a security building associated with the mail rail access point. Beneath the upper level is a basement area, which is accessed by ramps around the *Bathtub*.

3.8. The upper and lower levels of the Calthorpe Street site are largely covered with tarmac, although two areas of small amenity grassland are present in the north-west part of the Calthorpe Street site. There are also several trees located in these areas and within the *Bathtub*. An Arboricultural Survey for the Site was undertaken by Greenman Environmental Management Ltd and is presented in Appendix 3.1. The trees were identified as either of moderate, low or poor quality. None of the trees located on the Calthorpe Street site are subject to Tree Preservation Orders.

3.9. As illustrated in Figure 3.2, there are numerous items of underground infrastructure beneath the Calthorpe Street site associated with the former and current operations of the Mount Pleasant Sorting Office, adjoining the south-eastern boundary of the Calthorpe Street site.

3.10. The Post Office Railway ('Mail Rail') tunnels, which ceased commercial operation in May 2003, extend across the central part of the Calthorpe Street site in south-east to north-west direction, extending to the south beneath the adjacent Mount Pleasant Sorting Office. The upper levels of the Mail Rail tunnels are located between approximately between 11.12m AOD and 2.79m AOD. The entrance to the Mail Rail tunnels and the Maintenance Depot of the Mail Rail are located in the north-western part of the Calthorpe Street site. A ventilation shaft and an emergency escape from the Mail Rail tunnels are located within the *Bathtub,* approximately 2.5m above the slab.

3.11. Although the Fleet River Sewer is located to the west of the Calthorpe Street site beneath the road, Phoenix Place (approximately 3m below the finished street level), the Fleet River Sewer Branch extends beneath the northern part of the Calthorpe Street site in a north-east to south-west direction between Farringdon Road and Phoenix Place. The Fleet River Sewer Branch, which is relatively shallow and located just beneath the *Bathtub,* is located between approximately 11.43m AOD and 12.66m AOD.

Phoenix Place Site

3.12. As shown in Figure 3.3, the Phoenix Place site is largely used as a car park for Royal Mail staff, which is set over different levels. The Phoenix Place site accommodates approximately 250 parking spaces. Occasionally, parts of Phoenix Place are used for overspill operational parking from the Calthorpe Street site. A brick and corrugated building (former Rail Mail House known as Petrone House) located in the northern part of the Phoenix Place site is currently in use, temporarily, by the I.T. department of the Mount Pleasant Sorting Office. Whilst the modernisation of the Mount Pleasant Sorting Office is being carried out, the yard within the northern part of the Phoenix Place site is being used as a construction compound (canteen) for contractor workers. A number of disused buildings behind Calthorpe House, 15 to 20 Phoenix Place, extend across the north-western corner of the Phoenix Place site.

3.13. Phoenix Place is covered with compacted fill material and broken concrete, with no areas of landscaping. As reported in Appendix 3.1, there are also no trees located on the Phoenix Place site.

Existing Land Uses Surrounding the Site

3.14. The Mount Pleasant Sorting Office, located along the southern boundary of the Calthorpe Street site (as shown on Figure 3.4), currently provides sorting facilities for mail, including the Central London Mail Centre, some international distribution operations and the City Delivery Office (Use Classes B1 and B8). The Mount Pleasant Sorting Office operates 24 hours, including at weekends, with vehicles loading and unloading at any time of the day or night. It is estimated that the Mount Pleasant Sorting Office currently employs approximately 1,500 people.

3.15. The Mount Pleasant Sorting Office comprises the Public Office Building (administrative area) and Letter Office Building (operations area), together British Postal Museum and Archive (BPMA) and internal loading bays. The Public Office Building is located in the eastern corner of the Mount Pleasant Sorting Office at the junction of Rosebery Avenue and Farringdon Road, whilst the BPMA is located in the western part of the Mount Pleasant Sorting Office. The existing offices in the Public Office Building are currently underutilised and only accessible through the main entrance of the Letter Office Building. The remainder of the Mount Pleasant Sorting Office is the principal operations area.

3.16. The Mount Pleasant Sorting Office is stepped in height and rises up to four storeys. Roof plant currently includes water tanks, pipes, boiler flues and heating plant. The water tanks are located on the north-eastern corner and central part of the roof of the Letter Office Building, whereas the boiler flues are concentrated along the eastern part of the rooftop and along the north elevation of the Letter Office Building.

3.17. At the time of undertaking the EIA, the adjacent Mount Pleasant Sorting Office was being modernised (see Future Land Uses Surrounding the Site for details) with the external façade of the Letter Office Building and Public Office Building surrounded by a sheeted façade access scaffold. Prior to the modernisation works, the external façade material comprised a combination of horizontal metal cladding panels intercepted by glass and vertical columns and rendered in off white cement. The western façade of the Letter Office Building comprises rendered brick at ground level with light weight construction above.

3.18. As illustrated in Figure 3.4, the Site is surrounded predominately by residential and commercial uses, with the nearest residential properties located along Calthorpe Street, Farringdon Road and Mount Pleasant adjacent to the boundary of the Site. Residential properties are also located along Rosebery Avenue, Elm Street, Gray's Inn Road and Sherston Court. Commercial uses surrounding the Site largely relate to office and retail uses. Notable commercial uses immediately surrounding the Site include:

- Offices and retail units located along Farringdon Road, Mount Pleasant, Rosebery Avenue, Elm Street, Gough Street, Coley Street and Gray's Inn Road, which include New Printing House Square and the ITN building;
- Clerkenwell Fire Station located on Rosebery Avenue;
- Public houses on Calthorpe Street and Mount Pleasant; and
- Holiday Inn located at the junction of Kings Cross Road and Calthorpe Street.

3.19. There are also a number of community facilities in proximity to the Site. The nearest include Christopher Hatton Primary School located 70m south-east of the nearest Site boundary, Finsbury Health Centre located 170m east of the nearest Site boundary and St George the Martyr Church of England Primary School located 230m south-west of the nearest Site boundary. In addition, the nearest secondary schools to the Site are Elizabeth Garrett Anderson School for Girls and the Central Foundation Boy's School located 1km north-west and 2km north-east from the nearest Site boundary, respectively. The nearest public open spaces to the Site are Wilmington Square, St. Andrew's Gardens and Gray's Inn Gardens, which are located 120m north-east, 95m north-west, 220m south-west of the nearest Site boundary, respectively. Gray's Inn Gardens is on the English Heritage 'Register of Parks and Gardens of Special Interest'.

Future Land Uses of the Site

Calthorpe Street Site

3.20. Future land uses on the Calthorpe Street site are not anticipated to be significantly different to the existing land uses of the Site. Following the modernisation of the Mount Pleasant Sorting Office, the Calthorpe Street site will continue to be used as a delivery and service yard, primarily for loading and unloading operations, as described above. However, it is anticipated that deliveries and servicing activities would increase, which is described in more detail later in this Chapter under the Transportation and Access section.

Phoenix Place Site

3.21. Future land uses on the Phoenix Place site are generally not anticipated to be significantly different to the existing land uses of the Site, with much of the Phoenix Place site continuing to be used as a staff car park for Royal Mail. However, following the completion of the modernisation of the Mount Pleasant Sorting Office, the building currently used by the I.T. department of Royal Mail (former Rail Mail House) will become vacant as the department is relocated back into the Mount Pleasant Sorting Office. The northern part of the Phoenix Place site will also no longer be used as a construction compound. No further changes to the uses of Phoenix Place are anticipated.

Future Land Uses Surrounding the Site

3.22. As identified in Chapter 1: *Introduction* and Chapter 2: *EIA Methodology*, the Applicant is rationalising mail processing operations across London, which involves the refurbishment and modernisation of the Mount Pleasant Sorting Office to accommodate the operations from the Rathbone Place and Nine Elms Sorting Offices and to enable the release of the Calthorpe Street site for development. To accommodate additional delivery office functions, a series of external modifications and internal modernisation works are currently being undertaken (at the time of undertaking the EIA reported in this ES) under a series of extant planning permissions. The planning applications submitted to the LBI for determination in relation to the modernisation of the Mount Pleasant Sorting Office are listed in Table 2.1 of Chapter 2: *EIA Methodology*.

3.23. A description of internal and external modernisation works of the Mount Pleasant Sorting Office, which form part of the future baseline conditions surrounding the Site, is provided below. The modernisation of the Mount Pleasant Sorting Office is expected to be completed by the end of 2013.

3.24. Apart from the changes described below and the cumulative schemes considered in Chapter 17: *Cumulative Effects,* it is assumed that there would be no further changes to the land uses surrounding the Site for the purposes of the EIA.

External Modifications to Mount Pleasant Sorting Office

3.25. The Applicant is currently undertaking external alterations and upgrades to the Mount Pleasant Sorting Office with regard to both the Public Office Building and Letter Office Building.

3.26. A single storey reception building fronting Farringdon Road will be constructed to the north of the Public Office Building to provide a more user friendly reception area for the refurbished Public Office Building. The creation of a new entrance and main office on Farringdon Road would facilitate the relocation of office staff from Rathbone Place in Westminster. The reception will provide the entrance and create an active frontage to the western side of Farringdon Road which is currently lacking. The new entrance pavilion will also resolve the level differences between the pavement of Farringdon Road and the levels within the Sorting Office. The reception will have a large deep mullion aluminium bay window fronting onto the street with glazed access doors and a bio diverse green roof. A glass roof and wall panel will serve interface between the existing fabric and the new building, which will be 24.90m AOD in height.

3.27. The windows of the Public Office Building and the Letter Office Building are being replaced to improve internal environmental performance. The existing rendered fabric of Public Office Building and the Letter Office Building will be subject to an off-white paint finish.

3.28. The western elevation of the Letter Office Building which fronts Phoenix Place consists of a variety of service and commercial uses at ground floor level with a ramp accessing the West Loading Bay located on the upper level of the Letter Office Building. The existing structure of the western elevation will remain to support the new façade materials and specification fit windows and louvres. The western elevation façade will be cleared of services, such as rain water pipes, which will be re-routed internally within the Letter Office Building.

3.29. New openings within the existing pavilion of the Letter Office Building on the corner of Mount Pleasant and Phoenix Place will be created to provide an active frontage. This existing pavilion will be replicated to the north of the West Loading Bay to balance the façade. Shop-fronts will be installed along the western façade to relocate the 'caller's office' and create more active frontage at street level. The ground floor uses will be emphasised through the framing of each activity to create a clearer frontage. The shop-fronts will be in the form of reconstituted stone (glass reinforced concrete) cladding on the existing steel structure of the West Loading Bay. In addition, a canopy will be installed over the existing loading bay located at lower ground floor level and a new screen above to reduce noise and light spill.

3.30. The existing water tanks, boiler flues and some pipe work on the roof of the Mount Pleasant Sorting Office will be demolished and removed to facilitate the upgrade of the roof plant. Subject to planning permission, new plant will include air handling plant, condensers (with acoustic screens, where necessary), boiler flues, a water tank housing for pump enclosures and ductwork. The new boiler flues will be located on, and therefore will be visible from, the west elevation of the Public Office Building and the east elevation of the Letter Office Building. The new boiler flues on Letter Office Building would replace the existing boiler flues and be of similar height. The new water tank would replace the existing water tank currently located on the central part of the roof of the Letter Office Building.

Internal Modifications to Mount Pleasant Sorting Office

3.31. To facilitate the intensification of the Mount Pleasant Sorting Office, the international distribution operations currently accommodated with the Letter Office Building will be located elsewhere offsite and, internally the Letter Office Building and Public Office Building will be modernised.

3.32. Beneath the West Loading Bay in the western part of the Letter Office Building, the basement would be reconfigured internally to allow relocation of loading bays to suit the reconfigured basement operation. Also within the basement, the Priority Services Locker will be refurbished.

3.33. The first floor level of the Letter Office Building will be refurbished and reconfigured internally to accommodate the operations of the W1 Delivery Office currently located at Rathbone Sorting Office and also the EC Delivery Office of the Mount Pleasant Sorting Office, which is currently located within the basement. The second floor level will also be refurbished to accommodate the following facilities:

- WC Delivery Office to be relocated from the Rathbone Sorting Office to the south-west area of the second floor level;
- New restaurant facilities to be located in the north-west area of the second floor; and
- Administration office accommodation to be located in the south-east and north-east areas of the second floor.

3.34. Similarly, the third floor of the Letter Office Building will be refurbished and reconfigured to accommodate further offices.

3.35. Following completion of the modernisation of the Mount Pleasant Sorting Office and relocation of the Rathbone Place and Nine Elms Sorting Offices to the Mount Pleasant Sorting Office, employment levels are expected to increase compared to current levels. It is anticipated that following the modernisation of the Mount Pleasant Sorting Office, approximately 2,000 people would be employed.

Environmental Characteristics on the Site and Surrounding Area

Transportation and Access

Existing Characteristics

3.36. The Site is strategically situated between Farringdon Station, located approximately 900m south-east of the Site and Kings Cross / St Pancras Station, located 960m north-west of the Site. Farringdon Station and Kings Cross / St Pancras Station offer overground mainline services and London Underground lines. Farringdon Station, the nearest to the Site, is served by mainline services from Brighton to Bedford (via London), Sutton and Wimbledon to Luton (via London) and Sevenoaks and Orpington to London and three London Underground lines (Circle, Metropolitan and Hammersmith & City). When Crossrail opens in 2018, Farringdon Station will also be served by Crossrail trains.

3.37. The Site is also well served by existing bus routes with nine stops within walking distance of the Site. The nearest bus routes to the Site are located along Farringdon Road, Rosebery Avenue, Clerkenwell Road and Grays Inn Road. As described in Chapter 9: *Transportation and Access*, the Site benefits from very good to excellent accessibility to public transport, which is reflected in a Public Transport Accessibility Level (PTAL) rating. The PTAL varies from 5 to 6a on the Calthorpe Street site and 6b on the Phoenix Place site.

3.38. The Site is very well served by existing cycle routes, with five routes surrounding the Site deemed by Transport for London (TfL) as 'routes signed, or marked for use by cyclists on a mixture of quite or busier roads'. In addition, five Barclays Cycle Hire Stations are located within five minutes' walk of the Site, providing a total of 101 cycles.

3.39. Public access is not currently permitted onto the Site. Principal operational vehicular access / egress to the Calthorpe Street site is currently from Farringdon Road (designated a red route by TfL), whilst vehicles can also currently exit onto Phoenix Place. Vehicles access the delivery bays of the adjacent Mount Pleasant Sorting Office from the Calthorpe Street site, or alternatively, from the adjacent Mount Pleasant / Phoenix Place junction, which provides access to the basement of the adjacent Mount Pleasant Sorting Office (which accommodates 23 delivery bays). Vehicular egress from the adjacent Mount Pleasant Sorting office basement is onto Phoenix Place. Vehicular access to the Phoenix Place site, which is primarily used as a staff car park, is also from Phoenix Place.

3.40. At the peak of the Applicant's operations in the mid-1990s, traffic levels at the Site and adjacent Mount Pleasant Sorting Office were approximately 4,000 operational vehicle movements per day. However, traffic surveys undertaken by Colin Buchanan & Partners in 2003 found that the operations of the Mount Pleasant Sorting Office generated approximately 3,000 two-way vehicular movements per day at the Site and the adjacent Mount Pleasant Sorting Office. In 2010, traffic surveys undertaken by SKM at the operational vehicular access and egress points to the Mount Pleasant Sorting Office found two-way vehicular movements in the order of 2,000 per day, which peaked during 18:00 to 19:00 hours. Further traffic surveys surrounding the Site were undertaken in 2012; details of which are presented in Chapter 9: *Transportation and Access*.

Future Characteristics

3.41. As a result of the modernisation of the Mount Pleasant Sorting Office to accommodate the operations of the Rathbone Place and Nine Elms Sorting Offices, the operational vehicular movements at Mount Pleasant Sorting Office are expected to intensify compared to the existing situation. It is anticipated that operational vehicular movements associated with the modernised Mount Pleasant Sorting Office adjacent to the Site would be comparable to those measured in 2003, namely approximately 3,000 two-way operational movements per day on the local road network.

3.42. Further to the above, additional vehicular movements are also anticipated due to an increase in staff within the modernised Mount Pleasant Sorting Office and an associated increase in staff parking provision of approximately 50 spaces. This is expected to lead to an additional 305 two-way staff vehicular movements which, when combined with existing staff and future operational vehicular movements, is expected to result in a total of approximately 4,000 future two-way vehicle movements per day associated with the modernised Mount Pleasant Sorting Office.

3.43. With the exception of the increase in traffic on the local road network described above and the introduction of Crossrail to Farringdon Station in 2018, together with other cumulative schemes, it is anticipated that there would be no further changes to traffic or public transport. Further details regarding the prediction of future traffic are presented in Chapter 9: *Transportation and Access*.

Air Quality

Existing Characteristics

3.44. Both the Calthorpe Street site and the Phoenix Place site are located in an Air Quality Management Areas, owing to predicted exceedances of the national air quality strategy objectives for nitrogen dioxide (NO_2) and particulate matter less than 10µm in diameter (PM_{10}). In order to supplement existing air quality monitoring data within LBI and LBC, and to establish ambient concentrations at, and immediately surrounding the Site, an air quality monitoring study was undertaken in 2013. This confirmed that the estimated annual mean NO_2 concentrations at the Site exceeded the annual mean objective value of 40µg/m3 at all the monitored locations. The principal source of NO_2 is vehicular exhaust emissions along major roads such as Farringdon Road. Further details of the air quality monitoring study are given in Chapter 11: *Air Quality*.

Future Characteristics

3.45. The intensification of operations at the Mount Pleasant Sorting Office would have the potential to increase air pollutants at and surrounding the Site, due to associated increases in traffic movements, as described in the Transportation and Access section above. This increase has been included within future predicted traffic movements on the local road network for the anticipated opening years for the Development Scenarios of 2018 and 2020. As the air quality assessment considers the effects of the Development Scenarios against the 'without Development' situation at the year of opening only, in accordance with standard best practice, it is not necessary to quantify an interim future baseline for the year of opening of the modernised Mount Pleasant Sorting Office (i.e. end 2013).

3.46. Air quality modelling, using future traffic flow data, was used to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations during the anticipated opening years. This predicted concentrations to exceed the annual mean NO_2 objective, with the highest concentrations predicted at the façade closest to the junction of Farringdon Road and Calthorpe Street. Further details are provided in Chapter 11: *Air Quality*.

Noise and Vibration

Existing Characteristics

3.47. The Department for Environment, Food and Rural Affairs (DEFRA) has adopted a Noise Action Plan for London which sets out a process for identifying 'Important Areas' and 'Quiet Areas' to assist in the management of noise. The Noise Action Plan identifies Farringdon Road / Theobald's Road as an 'Important Area', within which the Local Planning Authority seeks to investigate measures to reduce noise.

3.48. Noise monitoring surveys undertaken at and surrounding the Site in January 2010, January 2011, August 2012 and January 2013 found that the dominant noise source was road traffic, including movement of vehicles entering and exiting the Mount Pleasant Sorting Office. Commercial aircraft noise was also a noticeable source of noise. Vehicle movements represent the main source of ambient and maximum noise generation within the Site, which included occasion sound from safety reversing alarms.

3.49. Observations during the vibration monitoring survey undertaken in August 2012 identified the main source of ground vibration was from movements of Heavy Good Vehicles on Farringdon Road. No other noticeable short-term increases in vibration level were noticed which suggested there to be negligible contribution from underground train movements. Further details of the ambient noise and vibration environment are presented in Chapter 10: *Noise and Vibration*.

Future Characteristics

3.50. Traffic data provided by the Transport Consultants, SKM Colin Buchanan, indicates a change in traffic flows following the modernisation of the Mount Pleasant Sorting Office. The change in traffic flows is expected to result in a slight increase in road traffic noise. A difference of less than 3 dB is generally indiscernible; all changes in basic noise level due to traffic flow are less than 1 dB.

3.51. Current ground borne vibration levels are not expected to change as a result of the modernisation of the Mount Pleasant Sorting Office.

Flood Risk

Existing Characteristics

3.52. The Site is located approximately 1km south of the Regent's Canal and 1.5km north of the River Thames. Although there are no surface water courses within the Site.

3.53. The former River Fleet flows beneath the Phoenix Place site, generally following the line of the road, Phoenix Place. The Environment Agency Flood Maps do not indicate the River Fleet as a 'main river' because it has been integrated into the local sewer network. A smaller tributary of the Fleet River passes beneath the northern part of the Calthorpe Street site, which is now known as the River Fleet Branch Sewer

3.54. The Site is located within Flood Zone 1 and is therefore considered to be at a low risk of tidal and fluvial flooding. At present, the Calthorpe Street site and to a lesser extent the Phoenix Place site are largely covered in hard-standing and therefore surface water runoff is currently drained into the network of combined sewers. Further details of the flood risk and drainage of the Site are presented in Chapter 14: *Water Resources and Flood Risk*.

Future Characteristics

3.55. The modernisation of the Mount Pleasant Sorting Office, as described above, is not expected to alter the future land uses on the Site, nor the extent of hard-cover and the existing drainage network. Consequently, the flood risk to the Site and the drainage regime are not anticipated to significantly alter from the existing characteristics of the Site.

Ground Conditions

Existing Characteristics

3.56. Historical land uses on the Site have the potential to give rise to localised contamination. The Site was used formerly as a rubbish tip (18th Century), Prison (18th to 19th Century) and latterly a postal sorting office. Currently, the Calthorpe Street site includes several waste storage skips, as well as a fuel filling station, which is associated with the Applicant's uses at the adjacent Mount Pleasant Sorting Office. The Site in its current uses therefore also has the potential to give rise to localised ground contamination.

3.57. Previous ground investigations on the Site indicate a variable thickness of Made Ground. This is underlain by Alluvium (associated with the former River Fleet), River Terrace Deposits, London Clay Formation, Lambeth Group, Thanet Sand Formation and the Chalk Group at depth. The deposits above the London Clay Formation support Secondary A Aquifers.

Future Characteristics

3.58. The modernisation of the Mount Pleasant Sorting Office, as described above, and including the removal of the temporary construction compound currently on the Phoenix Place site, is not expected to significantly alter the future land uses or nature of activities on the Site. Consequently, ground conditions at the Site and potential contamination sources are not anticipated to significantly alter from the existing characteristics of the Site.

Archaeology

Existing Characteristics

3.59. The Site includes no designated buried heritage assets, other than the Phoenix Place site, which is partly within an Archaeological Priority Area '*London Suburbs*' as designated by LBC. The designation relates to the late medieval and post-medieval expansion of the City of London from its Roman and medieval core. The designated area covers the northern part of the Phoenix Place site and its boundary also abuts the southern boundary of Phoenix Place site.

Future Characteristics

3.60. The modernisation of the Mount Pleasant Sorting Office, as described above, is not expected to alter the future land uses on the Site, nor affect the ground conditions. Consequently, there would be no changes to the potential for archaeological remains to exist on the Site.

Townscape, Visual and Built Heritage

Existing Characteristics

3.61. The Calthorpe Street site is located within the Rosebery Conservation Area, adjacent to Bloomsbury Conservation Area and close to the Hatton Garden Conservation Area, Clerkenwell Green Conservation Area and New River Conservation Area. Although the Phoenix Place site is not located within a Conservation Area, the Bloomsbury Conservation Area and Hatton Garden Conservation Area are located immediately to the north and south of this part of the Site, respectively and the site is close to the New River and Clerkenwell Green Conservation Areas. The location of the Conservation Areas is shown in Figure 3.5.

3.62. There are no listed buildings located on either the Calthorpe Street site or the Phoenix Place site. However, as identified within Table 3.1 below and Figure 3.5 there are a number of listed buildings and structures surrounding the Site. The nearest listed buildings to the Site are as follows:

- 47-57 (odd) Mount Pleasant (Grade II Listed) located immediately to the south of the Phoenix Place site;
- Apple Tree Public House (Grade II listed) located immediately to the south of the Phoenix Place site;
- No. 26 and Nos. 28-48 Calthorpe Street (Grade II listed), which adjoin the northern edge of the Phoenix Place site, immediately to the south-west of the Calthorpe Street site;
- 1, 2 and 3 Pakenham Street (Grade II listed), immediately to the west of the Calthorpe Street site; and
- 45, 47 and 49 Calthorpe Street, immediately to the north of the Calthorpe Street site.

3.63. As identified within The London View Management Framework Supplementary Planning Guidance[3], the Site is located within the Landmark Viewing Corridor and lateral Wider Setting Consultation Area of Protected Vistas of St Paul's Cathedral for the following views:

- 3A.1: View from Kenwood to St Paul's Cathedral; and
- 2A.1: View from Parliament Hill to St Paul's Cathedral.

3.64. Additionally, the Site sits to the west of and has been tested in relation to several views identified within the LBI Unitary Development Plan[4] and emerging LBI Development Management Policies including:

- LV4 Archway Road to St Paul's Cathedral;
- LV5 Archway Bridge to St Paul's Cathedral; and
- LV7 Dartmouth Park Hill to St Paul's Cathedral.

3.65. The streetscape surrounding the Site is not defined by a single overriding stylistic era with a great variety of architectural styles and building types that have responded over the centuries to changing opportunities and demands. Further details of the surrounding townscape character and visual quality are presented in Volume 3: *Townscape, Visual and Built Heritage Assessment*.

Future Characteristics

3.66. A new single storey reception building on the Public Office Building fronting Farringdon Road will be constructed as part of the modernisation of the adjacent Mount Pleasant Sorting Office. In addition, the façade material of both the Public Office Building and the Letter Office Building will be upgraded along with the roof plant, as described earlier in this Chapter. Whilst the appearance of the Mount Pleasant Sorting Office will be altered, the proposed changes are not expected to significantly alter the streetscape surrounding the Site.

Sensitive Receptors

3.67. Consideration was given to potentially sensitive receptors existing on or adjacent to the Site, together with existing and future sensitive receptors likely to be introduced to the surrounding area that could be sensitive to the construction and operational phases of each of the Development Scenarios. These potentially sensitive receptors are listed in Table 3.1.

Table 3.1: Potentially Sensitive Receptors

1.	Sensitive Receptor / Land Use
Construction workers	Construction and maintenance workers on the Site during the demolition and construction works.
Pedestrians	Employees of, and visitors to, the adjacent Mount Pleasant Sorting Office to the south-east of the Site. Future employees and visitors to either the Calthorpe Street Development or Phoenix Place Development once completed.
Residents	Residents of existing properties surrounding the Site, including residents along Calthorpe Street, Elm Street, Farringdon Road, Mount Pleasant and Rosebery Avenue. Future residents of either the Calthorpe Street Development or Phoenix Place Development once completed.
Commercial	Existing office and retail workers along Rosebery Avenue, Elm Street, Gough Street, Calthorpe Street, Mount Pleasant, Kings Cross Road, Farringdon Road and Grays Inn Road including: • ITN premises located approximately 20m south-west of the Site on Gough Street; • Clerkenwell Fire Station located on Rosebery Avenue approximately 90m south-east of the Site; • New Printing House Square located approximately 20m south-west of the Site; and • Employees of the Holiday Inn at the junction of Kings Cross Road and Calthorpe Street, located immediately north of the Calthorpe Street site. Existing employees to the current BPMA and future employees and visitors to the new BPMA proposed immediately north of the Phoenix Place site. Employees of the adjacent Mount Pleasant Sorting Office.
Leisure / Amenity	Visitors using the Holiday Inn located within LBC immediately north of the Site. Visitors using local parks including: • St Andrews Gardens located 95m north-west of the Site within the LBC; • Wilmington Square located 120m north-east of the Site within the LBI; • Spa Fields Park located 200m east of the Site within the LBI; • Gray's Inn Gardens located 220m south of the Site within the LBC; • Skinner Street Open Space located 290m east of the Site within the LBI; • Coram's Fields located 330m west of the Site within the LBC;

1.	Sensitive Receptor / Land Use
	• 3 Corners Adventure Playground located 300m east of the Site within the LBI; • Spa Green located 460m north-east of the Site within the LBI; and • St James Church Gardens located 485m south-east of the Site within the LBI.
Community Facilities	Existing community facilities within the vicinity of the Site including: • Community centres located 100m north-west and 350m west of the Site within the LBC; • Nurseries located 150m south and 300m west of the Site within the LBC; • Christopher Hatton Primary School located 70m south-east of the Site within the LBC; • Finsbury Health Centre located 170m south-east of the Site within the LBI; • Greenwood House Community Centre located 220m east of the Site within the LBI; • St George the Martyr Church of England Primary School located 230m west of the Site within the LBC; • Clerkenwell Parochial Church of England Primary School, 25 Amwell Street located 300m north-east of the Site within the LBI • Great Ormond Street Hospital located 390m north-west of the Site within the LBC; • Hugh Myddelton Primary School, Myddelton Street located 440m north-east of the Site within the LBI; • Finsbury Library located 490m north-east of the Site within the LBI; • St Peter and St Paul RC Primary School, 43 Compton Street located 710m east of the Site within the LBI; • Central Foundation Boy's School located 1km to the north-east within the LBI; • Elizabeth Garrett Anderson School for Girls located 1km to the north-west within the LBC; and • University College London Hospital located 1.4km west of the Site within the LBC.
Heritage Assets	The Calthorpe Street site is located within the Rosebery Avenue Conservation Area. There are also a number of Conservation Areas surrounding the Site. • The New River Conservation Area located to the north of the Site; • Bloomsbury Conservation Area located immediately to the north-west of the Site; • Hatton Garden Conservation Area immediately to the south of the Site; and • Clerkenwell Green Conservation Area to the south-east of the Site. There are a number of listed buildings / structures surrounding the Site, including: • 47-57 (odd) Mount Pleasant (Grade II Listed) located approximately 15m south of the Site within the LBC; • Apple Tree Public House (Grade II listed) located approximately 15m south of the Site within the LBC; • 26, 28-48 and 50 Calthorpe Street (Grade II listed) located approximately 15m north of the Site within the LBC; • 1-21 Calthorpe Street (Grade II listed) located approximately 30m north of the Site within the LBC; • 2-24 (even) & 23-43 & 45-49 (odd) (Grade II Listed) Calthorpe Street located approximately 25m north of the Site within the LBC; • 1 (Pakenham Arms Public House), 2 and 3 Pakenham Street (Grade II listed)

1.	Sensitive Receptor / Land Use
	located approximately 30m north of the Site within the LBC; • Rosebery Avenue Bridge Viaduct (Grade II listed) located approximately 65m south of the Site within the LBC; • 40 Rosebery Avenue (Grade II listed) located approximately 90m south of the Site within the LBI; • 94 Farringdon Road (Grade II listed) located approximately 120m south-east of the Site within the LBI; • 21 & 23, 38 & 39 and 40-47 Yardley Street (Grade II) located approximately 125m north-east of the Site within the LBI; • 42-44 Rosebery Avenue, Clerkenwell Fire Station (Grade II listed) located approximately 90m south of the Site within the LBI; • Finsbury Health Centre (Grade I listed) approximately 170m south-east of the Site within the LBI; • Church of Our Most Holy Redeemer, Exmouth Market (Grade II listed) located approximately 200m east of the Site within the LBI; • Charles Dickens House (Grade II) located approximately 210m west of the Site within the LBC; • 11-26 Mecklenburgh Square (Grade II listed) located approximately 250m north-west of the Site within the LBC; • Presbytery to the Roman Catholic Italian Church of St. Peter (Grade II listed) located approximately 275m south-east of the Site within the LBC; • Finsbury Town Hall (Grade II listed) located approximately 340m east of the Site; and There are two Registered Parks and Gardens within 1km of the Site: • Gray's Inn Gardens approximately 220m south-west of the Site within the LBC; and • Coram's Fields located approximately 330m north-west of the Site within the LBC. Potential buried heritage assets (archaeological remains) beneath the Site (part of the Phoenix Place site is located in an Archaeological Priority Zone). Schedule Monument Benedictine Nunnery of St Mary, Clerkenwell located 390m south-east of the Calthorpe Street site.
Views	As identified within the London View Management Framework Supplementary Planning Guidance , the Site is located within the Landmark Viewing Corridor and lateral Wider Setting Consultation Area of Protected Vistas of St Paul's Cathedral for the following views: • 3A.1: View from Kenwood to St Paul's Cathedral; and • 2A.1: View from Parliament Hill to St Paul's Cathedral. Additionally, the Site is located within several views identified within the LBI Unitary Development Plan including: • LV4 Archway Road to St Paul's Cathedral; • LV5 Archway Bridge to St Paul's Cathedral; and • LV7 Dartmouth Park Hill to St Paul's Cathedral.
Transportation	Cyclists, underground / rail and bus users, road and disabled users on the surrounding road network.
Controlled Waters	Secondary B Aquifer beneath the Site.
Air Quality	Air Quality Management Areas covering both LBC and LBI which include the Site.

Note: distances given in Table 3.1 are to the nearest boundary of the Site.

Summary of Key Changes between Existing and Future Characteristics

3.68. A summary of the principal changes to the existing and predicted future conditions of the Site and surrounding area following the modernisation of the Mount Pleasant Sorting Office is presented in Table 3.2.

Table 3.2: Key Changes Existing and Future Environmental Characteristics

Topic	Description of Key Changes
Transportation and Access	Employment at the Mount Pleasant Sorting Office is expected to increase from 1,500 to 2,000 employees, with approximately 305 additional staff vehicular movements expected as a result. Operational vehicular movements at the adjacent Mount Pleasant Sorting Office are expected to increase from approximately 2,000 to approximately 3,000 two-way operational movements per day on the local road network. The combination of staff and operational vehicular movements overall is expected to result in approximately 4,000 future two-way vehicle movements per day associated with the modernised Mount Pleasant Sorting Office.
Noise and Vibration	A change in traffic flows following the modernisation of the Mount Pleasant Sorting Office is expected to result in a slight increase in road traffic noise. However, all changes in basic noise level due to traffic flow are expected to be less than 1 dB. Current ground borne vibration levels are not expected to change as a result of the modernisation of the Mount Pleasant Sorting Office.
Air Quality	Operational vehicular movements at the adjacent Mount Pleasant Sorting Office are expected to increase compared to the existing operational vehicular movements. Therefore the intensification of operations at the Mount Pleasant Sorting Office would have the potential to increase air pollutants at and surrounding the Site, although this is not possible to quantitatively capture.
Flood Risk and Drainage	No significant changes are anticipated.
Ground Conditions and Contamination	No significant changes are anticipated.
Archaeology	No significant changes are anticipated.
Townscape, Visual and Built Heritage	Whilst the appearance of the adjacent Mount Pleasant Sorting Office will be altered through changes to the roof plant and façade material, the proposed changes are not expected to significantly alter the streetscape surrounding the Site.

References

1 Greater London Authority, 2011, The London Plan: Spatial Development Strategy for Greater London, July 2011.

2 London Borough of Camden, London Borough of Islington, 2011, Mount Pleasant Draft Supplementary Planning Document, October 2011.

3 Greater London Authority, 2012, The London View Management Framework Supplementary Planning Guidance (LVMF SPG) (2012).

4 London Borough of Islington, 2002, 'Unitary Development Plan', LBI, London.

4. Alternatives and Design Evolution

Introduction

4.1. This Chapter was prepared by Waterman Energy, Environment & Design (Waterman EED) with input from the four architects for the project: Allies and Morrison, Allford Hall Monaghan Morris, Feilden Clegg Bradley Studios and Wilkinson Eyre Architects. It provides a summary of the opportunities and constraints presented by the Site which have influenced the orientation, siting, height, layout, massing and design of the Calthorpe Street Development and Phoenix Place Development. Under the Town and Country Planning (Environmental Impact Assessment) Regulations 2011[1] (the 'EIA Regulations'), an ES is required (*inter alia*) to provide:

"*An outline of the main alternatives studied by the applicant … and an indication of the main reasons for his choice, taking into account the environmental effects*."

4.2. Accordingly, this Chapter also sets out the main alternatives and design evolution of the Calthorpe Street Development and Phoenix Place Development in response to environmental issues associated with the Site and surrounding area.

Objectives of the Development

4.3. As noted in Chapter 1: *Introduction*, the London Borough of Islington (LBI) and the London Borough of Camden (LBC) have jointly adopted the Mount Pleasant Supplementary Planning Document[2] (SPD) which covers the entire Site and the adjacent Mount Pleasant Sorting Office to the south-east. The Mount Pleasant SPD[3] sets out the planning framework for the redevelopment of the Site including a number of objectives which reflect planning policies and specific design issues relating to the Site and immediate surrounding area.

4.4. In line with the priorities and objectives identified within the Mount Pleasant SPD[4], the Applicant's objectives for redeveloping the Site are to:

- Introduce a new residential-led district providing public amenities such as shops, public spaces and community spaces;
- Provide a cohesive development incorporating both the Calthorpe Street and Phoenix Place sites that accommodates the operations of the Sorting Office, including the consideration of pedestrian and vehicular movements, architectural design, the underground Mail Rail, security, noise, etc.;
- Create a development that is unique but respects and enhances the scale and character of the surrounding neighbourhoods;
- Create distinct areas private and public spaces, linkages and movement across the Site; and
- Offer a wide choice to potential users through a broad mix of unit types.

Site Opportunities and Constraints

4.6. The range of opportunities and constraints which were considered during the design evolution of each of the Development Scenarios is summarised in Table 4.1 below, with a description of their influence, where appropriate. The opportunities and constraints reflect the urban setting of the Site, including the nature and built form of the surrounding area and in particular the operations of the adjacent Mount Pleasant Sorting Office. An appraisal of the redevelopment proposal's compliance with national, regional and local planning policy is provided in the Planning Statement, which is submitted as a standalone document accompanying the planning applications.

Table 4.1: Summary of Opportunities and Constraints of the Site

Issue	Specific Opportunities and Constraints
Planning and Future Land Uses	The Mount Pleasant SPD sets out key guidelines for any redevelopment of the Site, which is recognised as a major development opportunity to provide a significant number of new homes, business space and open space. The Site is also identified in the London Plan[5] (Policy 2.13) as being within an Opportunity Area for intensification, where there is significant capacity to accommodate new housing, commercial and other development on brownfield land. Consideration was therefore given to the objectives set out in the Mount Pleasant SPD, particularly in relation to providing new housing.
Future Land Uses	The Site forms part of, and is adjacent to, the Applicant's Mount Pleasant Sorting Office, which currently also includes the British Postal Museum and Archive (BPMA). The Site, particularly, the Phoenix Place site, is currently underutilised; it is largely used as a car park for Royal Mail staff. Owing to the modernisation of the Sorting Office, the Site will become available for redevelopment. Mount Pleasant Sorting Office operates 24-hours a day, including at weekends, with vehicles loading and unloading at any time of the day or night. Therefore, consideration was given to the interaction between the operation of the Sorting Office and the Development Scenarios. In particular, the Development Scenarios have been designed to enable the continued 24-hour operation of the Sorting Office.
Below Ground Structures	There are numerous items of underground infrastructure associated with Mount Pleasant Sorting Office beneath the Calthorpe Street site, notably the Mail Rail tunnels. There is also the Metropolitan Underground Line and the Fleet River Sewer, which extend close to the Calthorpe Street site. The Fleet River Sewer Branch extends beneath the Calthorpe Street Site. The underground infrastructure will be safeguarded for future use and allow the continued operation of the Sorting Office. The presence of below ground structures was a key consideration in the piling methodology, structural loading, basement depths, orientation and location of the buildings.
Archaeology	The Phoenix Place site is partly located within the London Suburbs Archaeological Priority Zone, as designated by the LBC. In addition, the Calthorpe Street site was historically occupied by 'Middlesex House of Correction' (1794 to 1889). The Site does not contain any other designated buried heritage assets (such as Scheduled Monuments) or any undesignated heritage assets of greater than low significance. The potential for the presence of and effect on buried archaeological remains on the Site are considered in Chapter 12: *Archaeology*.
Ground Conditions and Contamination	Owing to the nature of its historical uses there is the potential for localised ground contamination to be present beneath the Site. The potential for ground contamination was factored into to the consideration of ground works and any requirement for remediation.
Surface Water Drainage and Flood Risk	The Site is located within Flood Zone 1, with less than 1 in 1,000 annual probability of river or sea flooding (<0.1%) in any year) and is therefore considered to be at a low risk of tidal and fluvial flooding.

Issue	Specific Opportunities and Constraints
	The Development Scenarios would present an opportunity to reduce the volume of rainwater runoff which currently discharges freely into the sewer network from the delivery and service yard. To attenuate rainwater runoff from the proposed buildings, the Development Scenarios incorporate green and brown roofs and attenuation tanks or geo-cellular storage units. Further consideration of the options to attenuate rainwater runoff is provided in the Flood Risk Assessment, presented in Appendix 14.1.
Transportation and Access	The Site is well served by public transport; being located within a 10 minute walk of Kings Cross / St Pancras Station and Farringdon Station, as well as London Underground stations at Angel, Chancery Lane, Holborn and Russell Square. Regular bus services are available from Rosebery Avenue, Farringdon Road and Mount Pleasant. However, owing to the operations of the Sorting Office, staff car parking for Royal Mail will need to be incorporated into the Development Scenarios. The Site is currently not accessible to the general public and forms a barrier to movements in an east – west direction. Redevelopment presents an opportunity to enhance permeability through the Site by creating new pedestrian and cycling routes.
Noise and Vibration	The Site is located in a busy central London location and is surrounded by a mix of land uses including residential, commercial and retail uses. The dominant noise sources are from road traffic and operation of the adjacent Mount Pleasant Sorting Office. These sources of noise were therefore a key consideration in the location of sensitive uses (such as residential) on the Site (further details of which are provided later in this Chapter). The detailed design of the proposed buildings, and in particular the residential element, incorporates acoustic insulation. Further details of the existing noise environment and how the proposed buildings would achieve appropriate internal noise conditions are provided in Chapter 10: *Noise and Vibration*.
Air Quality	Air Quality Management Areas (AQMAs) have been designated across both the LBI and LBC owing to nitrogen dioxide (NO_2) and fine particulates (PM_{10}) currently exceeding the National Air Quality Standard objectives. The main source of these pollutants is road traffic exhaust emissions. Design consideration is necessary in relation to the internal conditions for future residents and minimising the effect of redeveloping the Site on local air quality. Further details are provided in Chapter 11: *Air Quality*.
Wind	The suitability of the local wind environment was considered in terms of the comfort levels required for particular pedestrian activities on and around the Site. This is of particular relevance to the provision of public, communal and private space and pedestrian routes.
Daylight, Sunlight and Overshadowing	The availability of daylight and sunlight to nearby residential properties represents a constraint on the redevelopment of the Site. Therefore, consideration was given through a number of studies to the height, massing and orientation of the proposed buildings to minimise the loss of direct daylight and sunlight at surrounding residential properties. Further details on how the design evolution responded to these constraints are provided later in this Chapter.
Townscape, Visual and Built Heritage	The Calthorpe Street site is located within the Rosebery Avenue Conservation Area and there are also a number of Conservation Areas and listed buildings surrounding the Site. Therefore, the height, massing and façade treatment of the proposed buildings were developed in response to the local vernacular, as described later in this Chapter. The taller buildings proposed are also carefully sited to minimise the effect on views, particularly the London View Management Framework Protected Vistas[6].

Alternatives to the Development

4.9. The principal alternatives that were considered by the Applicant, taking into account potential environmental effects, included the 'No Development' Scenario and Alternative Design and Land Uses. No alternative development sites were considered by the Applicant for the following reasons:

- Redevelopment of the Site presents an opportunity to provide a significant quantum of new housing, as promoted by the London Plan and the Mount Pleasant SPD;
- The Site, which is owned by the Applicant, is currently underutilised brownfield land. The Applicant is seeking to optimise the use of the Site; thereby realising a key development opportunity, as recognised by regional and local planning policies; and
- Opportunities exist to improve community facilities and connectivity in the local area through the provision of new public open space, play space areas, together with retail and community uses.

The 'No Development' Scenario

4.10. Guidance on the preparation of an ES stipulates that it is good practice to consider the evolution of a site in the absence of specific proposals, i.e. the 'No Development' scenario. The 'No Development' scenario is based on leaving the Site in its current state.

4.11. Without redeveloping the Site, the Calthorpe Street site would continue to be used 24 hours a day / night as a delivery and service yard for the Mount Pleasant Sorting Office. Similarly, the Phoenix Place site would continue to be largely used as a car park for Royal Mail staff. Because the refurbishment and modernisation works, as described in Chapter 3: *Existing and Future Land Uses,* are likely to be completed by the end of 2013, the delivery and service yard, together with the car park, would be subject to an increase in traffic movements compared to the existing conditions; further details are provided in Chapter 9: *Transportation and Access*.

4.12. However, the Site would remain underutilised and without redevelopment, the aspirations of the Mount Pleasant SPD would not be realised. The 'No Development' scenario would lead to a number of missed opportunities for the Site, including:

- Enhancing the 'urban grain' of the area by removing large areas of surface car park and returning these areas to recognisable urban blocks;
- Improving pedestrian permeability and connectivity between neighbourhoods; and
- Contributing to the housing target of least 11,600 and 12,250 additional dwellings across the LBI and LBC respectively up to 2016/17 and 2024/25 as set out in the adopted Core Strategies[7].

Alternative Design and Land Uses

Architectural Competition

4.13. Owing to their previous involvement, Wilkinson Eyre Architects (WEA) were directly appointed to design part of the scheme for Calthorpe Street site (Buildings E, F and G, as shown on Figure 5.1). In 2012, the Applicant held an architectural competition pursuant to appointing a further three architectural practices to design schemes for the remaining three plots of the Site, taking into account the opportunities and constraints presented by the Site, together with the aspirations of the Mount Pleasant SPD. A total of ten architectural firms were invited to submit initial design concepts for the Site, which were based on the illustrative Masterplan outlined within the Mount Pleasant SPD (refer to Figure 4.1) and a brief provided by the Applicant. The following architects were subsequently selected by the Applicant to develop the scheme for each plot within the Site:

- Allford Hall Monaghan Morris (AHMM): Building A (Phoenix Place site, as shown on Figure 5.1);
- Feilden Clegg Bradley Studios (FCBS): Building B, Building C and Building D (Phoenix Place site, as shown on Figure 5.1); and
- Allies and Morrison (A&M): Building H, Building J and Building K (Calthorpe Street site, as shown on Figure 5.1).

Design Evolution

4.14. TfL, LBI, LBC, Greater London Authority (GLA), English Heritage, the Design Council / Commission for Architecture and the Built Environment (CABE) and other key stakeholders such as community interest groups and residents were consulted. There were a number of significant design iterations in response to opportunities and constraints outlined in Table 4.1 and consultation responses raised in relation to the hierarchy of open space, distribution of massing and height, façades and frontages. A summary of the design evolution is provided below, which relates to all three Development Scenarios. Further details of the design process are provided in the Design and Access Statement and the Statement of Community Involvement which accompany the planning applications.

4.15. The design evolution and changes described below form part of the design of the Development Scenarios, which is detailed in Chapter 5: *The Proposed Development*. Each of the Development Scenarios aim to address the key constraints and opportunities presented by the Site, together with delivering the Applicant's vision as set above.

Building Configuration and Footprints

4.16. For the architectural competition the building locations were largely consistent with the locations proposed within the Mount Pleasant SPD, although a number of key changes were made following the competition stage, as described above.

4.17. Initially, Building E was envisaged as a continuation of the adjacent Mount Pleasant Sorting Office extending further to the south along Phoenix Place. However, the footprint of Building E was reduced so as not to adjoin the Sorting Office and interfere with its associated vehicle movements. The configuration of Building H has altered since the competition stage from initially a 'U' shaped block to an enclosed building with an internal courtyard, to create a better public space to the south (known as The Garden, as shown on Figure 5.1) in terms of improving sunlight availability and pedestrian permeability. Building H was subsequently moved south to increase the pavement width along Calthorpe Street. Similarly, the footprint and configuration of Building J was modified from a linear building on a podium along Phoenix Place to a trapezoidal-shaped building footprint with a bridge walkway access to allow for a new public square to the south (known as public Square C, as shown on Figure 5.1) and also to form a vehicle and pedestrian connection between Buildings H and J (known as The Lane, as shown on Figure 5.1). These changes, which created an atrium / courtyard, resulted in a more defined streetscape whilst also providing greater daylight levels into the residential units of Building J. Minor alterations were made to the footprint of Building F, with the entire building moved approximately 4.5m to the north, to improve access to the residential units and to create outdoor communal amenity space to the south.

4.18. The frontage of Building A along Mount Pleasant was also set back a further 3m from the road, in response to improving local townscape views from Mount Pleasant. The footprints of Building B and C were modified to create a greater degree of separation these buildings, whilst the footprint of Building D increased at the southern end to enclose the communal garden.

Height

4.19. The initial design concept for Building A located in the south of the Phoenix Place site was to respond to the local townscape character and local views. Initially, Building A varied in height from five to fifteen storeys, with the tallest element located in the south-western part of the Phoenix Place site on the corner of Mount Pleasant and Gough Street. Whilst this principle was maintained throughout the design evolution of Building A, following consultation responses, the distribution in height was reviewed. Subsequently, the height of Building A in the south-eastern part of the Phoenix Place site was lowered from eleven storeys to seven storeys and then further reduced to five storeys in height, corresponding to the scale of adjacent buildings. This was to reduce overshadowing to the internal courtyard located within Building A and therefore improve the daylight and sunlight provision. The change in height, particularly along the eastern edge of Mount Pleasant from 11 to five storeys in height, was tested in local views and was deemed to improve the townscape views and be more sensitive to the Grade II Listed 47 to 57 (odd) Mount Pleasant.

4.20. Throughout the design process, the heights of Buildings B, C and D remained relatively consistent. As shown on Figure 4.2, heights initially ranged from nine to ten storeys (above ground level). However, in response to consultation with LBC the upper floor was removed. Similarly, the height of Building C was reduced from nine storeys (above ground level) to seven storeys (above ground level). In contrast, the heights of Building D were increased from three storeys to four and five storeys (above ground Gough Street level).

4.21. Building E located on the Calthorpe Street site was also identified in the Mount Pleasant SPD as a medium rise building, and was presented as such within WEAs initial design concept. The height of Building E was subsequently increased by one storey to frame the public square north of the building to further articulate the separate building, adding vertical expression to the façade.

4.22. As illustrated in Figure 4.3, several heights were considered by A&M for Building H located in the northern part of the Calthorpe Street site. Initially, the height of Building H was relatively uniform, particularly along Calthorpe Street and Farringdon Road; with building heights ranging between six and seven storeys (above ground level). Following preliminary townscape and visual studies, the building heights along Calthorpe Street were stepped from eight storeys to five storeys (above ground level). Similarly, the height of the south-eastern elevation of Building H was initially relatively uniform, with heights ranging from three to four storeys (above ground level). To improve daylight and sunlight within the courtyard of Building H and to improve townscape views the heights were subsequently stepped, rising from four storeys to seven storeys above ground level. The south-western façade of Building H was reduced from six storeys to four storeys (above ground level) to increase daylight and sunlight within the internal courtyard of the building.

4.23. Originally A&M proposed that Building J would be six storeys in height. Following preliminary townscape and visual studies, Building J was reduced by two storeys from a five storey building with a podium to a three storey building with a courtyard to improve views from Calthorpe Street. The southern part of Building J was further reduced from three storeys to two storeys in height to increase daylight and sunlight within the courtyard of Building J. However, following discussions with the LBI, the height of Building K, to the south of Building J, was increased from one storey to three storeys to define public Square C and The Garden.

Massing

4.24. The massing of Building A was amended to reflect consultation responses and to improve local townscape views along Mount Pleasant. In particular, the breadth of the south-west corner of Building A was reduced along Mount Pleasant (see Figure 4.4), with the street frontages brought forward to produce a more elegant vertical proportion and to reduce the impact of townscape views. The upper storey of Building A was set back continuously along Gough Street and in part along Mount Pleasant and Phoenix Street and a reduction in massing was introduced to the south-east corner of Building A, as described above. Significantly the massing to the northern part of Building A was reduced by the introduction of a break in the footprint to improve sunlight to public Square P opposite (as shown on Figure 5.1). Further refinements include the staggered massing along Mount Pleasant being smoothed and realigned to improve the townscape views and to be more sympatric to the adjacent listed building. As with the alterations to the height of Building A, these changes were made to improve the townscape views and to be more sympathetic to the adjacent listed buildings.

4.25. As shown in Figure 4.2, the massing of Buildings B and C has remained relatively consistent throughout the design process. The key change to the massing was made to the upper part of the buildings, where initially, the upper storey was stepped back. However, owing to following consultation with LBC, the upper levels were reduced, resulting in a more uniform massing. Massing of Building D changed slightly with the uniform rectangular mass broken by the creation of the stepped façade, in order to respond to the scale of the existing terrace at Calthorpe Street and the proposed massing of Buildings B and C.

4.26. Initially Buildings E, F and G were one continuous building along the south-eastern part of Calthorpe Street (as shown on Figures 4.5). However, in response to consultation and to improve daylight and sunlight availability within the public Square C immediately to the north, the massing of the buildings were separated; creating two separate buildings, as shown on Figure 4.6. The massing of Building F was further broken through the set back of residential units on the upper floors. The massing of Building G has remained relatively constant throughout the design process because of its proximity to the Mount Pleasant Sorting Office, although its width was reduced, with the upper floors set back to improve townscape views and reduce overshadowing on Farringdon Road.

4.27. As described above, the massing of Building H was altered through several design iterations, as shown in Figure 4.3. The initial design concept was based on uniform massing, although the reduction in height along Calthorpe Street and the increase in height along the south-eastern elevation have reduced the massing. The massing and articulation was also altered to express the core clusters of the building. The massing of Building H was further reduced by the removal of pergola-like canopy structures on the private roof terraces, which in turn improved daylight and sunlight within the courtyard of Building H.

4.28. The massing of Building J also changed through the design process to reflect consultation responses. Initially, Building J had a uniform linear massing but it was subsequently changed to a trapezoidal building footprint, as described above. The reduction in height of Building J, together with breaking up its massing into two blocks, resulted in improvements in permeability from Phoenix Place to Farringdon Road, as well as within the Calthorpe Street site.

Land Use

4.29. The proposed land uses accord with the aspirations of the Mount Pleasant SPD and therefore have remained largely unchanged throughout the design process. However, a number of key changes were made to the land uses of three of the proposed buildings, as summarised below.

4.30. Initially, residential uses were proposed in Building G which adjoins the Mount Pleasant Sorting Office and fronts onto Farringdon Road. However, in accordance with the objectives of the Mount Pleasant SPD, a greater proportion of non-residential uses were introduced. It was therefore considered that Building G would be more suitable for office uses.

4.31. Retail and community uses were introduced at ground level within Buildings C, H, E and F to increase active frontages around the newly created public squares and along Farringdon Road, respectively. Originally, retail uses were provided on the north-east and south-east corner of Building H, although following review and consultation with the LBI, retail uses were increased along Farringdon Road. The introduction of retail and community uses at ground level along Building H removed residential receptors nearest to Farringdon Road.

4.32. Following the competition stage, Building K, which was initially a single storey pavilion located on Calthorpe Street, was moved to the new public square and increased in floor area to provide more retail space.

Materials

4.33. A new lightweight roof would be constructed between Building F and the northern elevation of the Mount Pleasant Sorting Office, as part of the Enabling Works for the Calthorpe Street Development. Initially, the roof was to comprise a metal composite deck with large full-span barrel vaulted rooflights. However, to improve the aesthetic appearance of the roof and also to provide ecological enhancements to the Site, a continuous metal composite deck with planting (seasonal flower meadow) and small interspersed south facing rooflights were introduced.

4.34. The principles of the exterior façade materials have remained largely constant throughout the design process. However, to reflect consultation responses from the Conservation Officer at LBI, changes were made to the façade treatment of Building F. Specifically, the proportion of window openings were discussed in detail with the Conservation Officer and an appropriate solution, where vertical pairs of windows were linked through the articulation of the brickwork, was found. Above this brickwork middle portion, it was discussed that the upper two floors would be set back and clad in a lighter, reflective material to clearly define the top to the composition.

References

1 TSO (2011). The Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (S.I.1824).

2 London Borough of Camden, London Borough of Islington, 2011, Mount Pleasant Supplementary Planning Document, October 2011.

3 London Borough of Camden, London Borough of Islington, 2011, Mount Pleasant Supplementary Planning Document, October 2011.

4 London Borough of Camden, London Borough of Islington, 2011, Mount Pleasant Supplementary Planning Document, October 2011.

5 Greater London Authority, 2011, The London Plan: Spatial Development Strategy for Greater London, July 2011.

6 Greater London Authority, 2012, The London View Management Framework Supplementary Planning Guidance (LVMF SPG) (2012).

7 London Borough of Islington, 2011, Adopted Core Strategy, February 2011

5. The Proposed Development

Introduction

5.1. This Chapter, which was prepared by Waterman Energy, Environment & Design Ltd (Waterman EED) with input from the four project architects, provides a description of the Development Scenarios relating to the redevelopment of the land adjoining, and forming part, of the adjacent Mount Pleasant Sorting Office. The description of the Development Scenarios provided in this Chapter, together with architectural planning application drawings and detailed elevations form, the basis of the Environmental Impact Assessment (EIA). The description of the proposal is provided separately for the Calthorpe Street Development (Development Scenario 2) and the Phoenix Place Development (Development Scenario 3), which together form the Entire Development (Development Scenario 1).

5.2. The description of the Development Scenarios is defined by the detailed planning application drawings submitted to the London Boroughs of Islington (LBI) and Camden (LBC) as appropriate for the Calthorpe Street site and the Phoenix Place site respectively. A selection of the planning application drawings referred to in this Chapter is presented in Volume 2: *Figures* of this Environmental Statement (ES).

5.3. Details of the anticipated demolition and construction sequence and programme of works for each Development Scenarios are outlined separately in Chapter 6: *Development Programme, Demolition and Construction*.

Overview of the Development Scenarios

5.4. It is anticipated that the entire Site would be redeveloped, although either the Calthorpe Street site or the Phoenix Place site could be developed in isolation. Consequently, there are three likely redevelopment Development Scenarios for the Site, as follows:

- Development Scenario 1: the Entire Development (i.e. Calthorpe Street Development (which includes the Enabling Works) and Phoenix Place Development);
- Development Scenario 2: Calthorpe Street Development (which includes the Enabling Works); and
- Development Scenario 3: Phoenix Place Development.

5.5. The Applicant is seeking detailed planning permission for the redevelopment of the Calthorpe Street site and the Phoenix Place site. The planning application boundaries for the Calthorpe Street site and the Phoenix Place site (i.e. the entire Site) are shown on Figure 1.2. Because the Calthorpe Street site is located in the Rosebery Avenue Conservation Area, Conservation Area Consent is also being sought for the Calthorpe Street Development. Two planning applications have been submitted to LBI and LBC as appropriate for determination, as follows:

- Calthorpe Street and Enabling Works Planning Application (which includes Conservation Area Consent); and
- Phoenix Place Planning Application.

5.6. To facilitate the redevelopment of the Site, a number of buildings on the Phoenix Place site including the former Rail Mail House (Petrone House) and the outbuildings to the rear of Calthorpe House, 15 to 20 Phoenix Place, together with remnants of building walls across the Phoenix Place site, would be demolished. A number of structures would also be demolished on the Calthorpe Street site, including a gate pavilion building located at the existing Farringdon Road entrance, ramps to, and parapets of, the *Bathtub* and the Loading Canopy / Enclosure of the adjacent Mount Pleasant Sorting Office.

5.7. All three Development Scenarios have been designed to enable the continued 24-hour operation of the adjacent Mount Pleasant Sorting Office to the south-east. The proposed Enabling Works would be undertaken on the Calthorpe Street site as the first phase of the Calthorpe Street Development. In summary, the Enabling Works would include:

- Moving all parking associated with Mount Pleasant Sorting Office into an extended basement beneath the Sorting Office and build a concrete slab at ground floor level over part of the existing *Bathtub* that would be retained by the Applicant;
- Relocating vehicular access on Farringdon Road, providing access to a ramp serving the basement, ground floor loading bays, and parking areas;
- Relocating the ventilation shaft and the escape stair from the underground infrastructure; and
- Constructing a new lightweight acoustic roof between the first floor level (north-western elevation) of the Mount Pleasant Sorting Office and proposed second floor level (above ground) of proposed Building F.

5.8. The description of the proposals for the Calthorpe Street site, as described in the planning application, is as follows:

Comprehensive redevelopment of the site following the demolition of existing buildings and structures to construct six new buildings ranging from 3 to 12 storeys in height to provide 38,015 sqm (GIA) of residential floorspace (Class C3), 4,260 sqm (GIA) of office floorspace (Class B1), 1,428 sqm (GIA) of flexible retail and community floorspace, (Classes A1, A2, A3, D1 and D2), with associated energy centre, waste and storage areas, vehicle and cycle parking, hard and soft landscaping to provide public and private areas of open space, alterations to the public highway and construction of a new dedicated vehicle ramp to basement level to service Royal Mail operations, construction of an acoustic roof deck over the existing servicing yard and all other necessary excavation and enabling works.

5.9. The description of the proposals for the Phoenix Place site, as described in the planning application, is as follows:

Comprehensive redevelopment of the site following the demolition of existing buildings to construct four new buildings ranging from 6 to 15 storeys in height to provide 38,723 sqm (GIA) of residential floorspace (Class C3), 822 sqm (GIA) of flexible retail and community floorspace (Use Classes A1, A2, A3, D1 and D2), with associated energy centre, waste and storage areas, vehicle and cycle parking (including the re-provision of Royal Mail staff parking), hard and soft landscaping to provide public and private areas of open space, alterations to the public highway and all other necessary excavation and enabling works.

5.10. In line with the Mount Pleasant Supplementary Planning Document[1] (SPD), the redevelopment of the entire Site would create a new residential-led mixed use scheme, providing new housing, amenity spaces and pedestrian links between the Site and surrounding areas. A summary of the proposed quantum of each land uses (Gross Internal Area) of the each planning application and Development Scenarios are presented in Table 5.1.

Table 5.1: Summary of Quantum of Land Uses Proposed within Each Planning Application

Use Class	Total Floorspace (Gross Internal Area (m^2))*		
	Calthorpe Street Application (Development Scenario 2)	Phoenix Place Application (Development Scenario 3)	Calthorpe Street & Phoenix Place Applications (Development Scenario 1)
Office (Use Class B1)	4,260	-	4,260
Flexible retail / community use (Use Classes A1, A2, A3, D1 and / or D2)	1,428	822	2,250
Residential (Use Class C3)	38,014	38,723	76,738
Basement	5,024	10,189	15,213
Total	**48,726**	**49,734**	**98,461**
Residential Units (No.)	336	345	681

Note: figures shown in Table 5.1 exclude basement, car park and plant areas.

Planning Application Drawings

5.11. A series of architectural planning application drawings and detailed elevations have been submitted to LBI and LBC as appropriate for determination. A list of the planning application drawings that are referenced in this Chapter are provided in Table 5.2 and are included in Volume 2: *Figures* of this ES.

Table 5.2: Planning Application Drawings Referenced in this Chapter

Planning Application Drawing Number	Planning Application Drawing Title
Calthorpe Street Planning Application Drawings	
00_07_139	Proposed GA Plan - Blocks H, J & K - Basement
00_07_140	Proposed GA Plan - Blocks H, J & K - Ground
00_07_214	Proposed Elevations - Blocks H, J & K
00_07_215	Proposed Elevations - Blocks H, J & K
00_07_306	Proposed Section - Blocks H, J & K - Sections FF, GG, HH
00_07_119	Proposed GA Plan - Blocks E, F & G - Basement
00_07_120	Proposed GA Plan - Blocks E, F & G - Ground
00_07_121	Proposed GA Plan - Blocks E, F & G - Level 1
00_07_122	Proposed GA Plan - Blocks E, F & G - Level 2
00_07_210	Proposed Elevation - Blocks E, F & G - North West
00_07_301	Proposed Section - Blocks E, F & G - Section AA
00_07_602_A0	Open Spaces Plan
Phoenix Place Planning Application Drawings	
11159_P1_(00)_P098	Basement (+8.10)
11159_P1_(00)_P100	Upper Ground (+17.225)
11159_P1_(00)_P099	Basement (+12.45)
11159_P1_00_P200	Block A Proposed Elevations - Mount Pleasant
11159_P1_00_P301	Block A Proposed Sections - Courtyard (South)
1660_P2_(00)_P100	Ground Level (+15.80)
1660_P2_P300	Plot P2 Phoenix Place locks B, C, D Proposed Sections 01 & 02
1660_P2_P302	Plot P2 Phoenix Place locks B, C, D Proposed Sections 05

Description of the Built Development

5.12. A description of the proposed built development is provided below for both the Calthorpe Street Development (Development Scenario 2) and Phoenix Place Development (Development Scenario 3), which together comprise the Entire Development (Development Scenario 1).

Building Location and Configurations

Calthorpe Street Development

5.13. The Calthorpe Street Development would comprise six buildings (known as Buildings E, F, G, H, J and K, as shown on Figure 5.1) separated at ground level by a linear open space (known as The Garden) which would extend from Phoenix Place to the south-west of the Calthorpe Street site to Farringdon Road to the north-east of the Calthorpe Street site.

5.14. As shown on the Calthorpe Street planning application drawings 00_07_120 and 00_07_121, Buildings E, F and G would be located south of The Garden extending the entire length of the south-eastern boundary of the Calthorpe Street site adjacent to the Mount Pleasant Sorting Office. At first floor level (above ground level), Building E, a rectangular building fronting Phoenix Place, is separated from Buildings F and G, which extend up to and along part of Farringdon Road, with Building F set back from the adjacent Sorting Office and connected to it by a new lightweight acoustic roof. The new lightweight acoustic roof would be constructed at the first floor level of the Sorting Office as part of the Enabling Works and therefore during the first phase of the Calthorpe Street Development. Building G, which fronts onto Farringdon Road, adjoins the north-eastern elevation of the Mount Pleasant Sorting Office.

5.15. Building H, a rectangular building which would include an enclosed courtyard as shown on Calthorpe Street planning application drawing 00_07_140, would be located in the north-eastern corner of the Calthorpe Street site at the junction between Calthorpe Street and Farringdon Road. Building J would be located adjacent to Building H at the junction of Calthorpe Street and Phoenix Place and is formed of two separate blocks connected by a series of elevated walkways and a courtyard. The Garden is separated by a small square building, known as Building K, which is located between Buildings J, E and F, as shown on the Calthorpe Street planning application drawing 00_07_140.

5.16. Following the Enabling Works, the proposed topography of the Calthorpe Street Development would be relatively flat, with ground levels ranging from 19.20m AOD in the eastern part of Calthorpe Street site to 18.20m AOD in the western part.

Phoenix Place Development

5.17. The Phoenix Place Development would comprise four separate buildings (known as Buildings A, B, C and D, as shown on Figure 5.1). Building A, a 'U' shaped building located in the southern part of the Phoenix Place site, would include an enclosed courtyard and would closely follow the alignment of Gough Street, Mount Pleasant and Phoenix Place, as shown on the Phoenix Place planning application drawing 1159-P1-00-100. The northern part of the Phoenix Place site would comprise three buildings (Buildings B, C and D) separated above ground by a communal garden, a courtyard and public open space (known as Building D Garden, Building B/C courtyard and Square P respectively, as shown on Figure 5.1).

5.18. The ground levels of the Phoenix Place Development would slope gently from 17.50m AOD in the northern part of the site to 13.35m AOD in the southern part along Mount Pleasant. However, Phoenix Square would be above the basement, with the ground level at 19.45m AOD.

Building Heights and Massing

5.19. The proposed heights and massing of the buildings within the Calthorpe Street Development and the Phoenix Place Development respond to the Mount Pleasant SPD, environmental constraints and consultation with LBI and LBC; further details are provided in Chapter 4: *Alternatives and Design Evolution*.

Calthorpe Street Development

5.20. As shown on the Calthorpe Street planning application drawings 00_07_120 and 00_07_210, the massing of Buildings E, F and G, which together form an 'L'-shape, comprise a series of stepped vertical tiers, with the elevations of the lower vertical tiers of Building F stepped back from the elevations of the higher vertical tiers, which together break the massing of these buildings. As detailed in Table 5.3, the maximum heights of Buildings E, F and G range between 44.37m AOD (including roof plant) for Building G and 62.10m AOD (including roof plant) for Building E. Building G fronting Farringdon Road is more uniform in height, which reflects the height of the adjacent Mount Pleasant Sorting Office. As shown on Calthorpe Street planning application drawing 00_07_122, a new lightweight acoustic roof would be constructed between the north-western elevation of the Sorting Office to Buildings E, F and G, enclosing the service and delivery yard. The new lightweight acoustic roof would be at a maximum height of 27.75m AOD.

5.21. Building H, which includes an enclosed courtyard is stepped in height, rising from 33.63m AOD (including roof plant) in the southern part of the building adjacent to Building J to 40.08m AOD and 43.30m AOD (including roof plant) along the south-western and south-eastern elevations, respectively, as shown on the Calthorpe Street planning application drawing 00_07_214. Building H rises to a maximum height of 46.53m AOD (including roof plant) along the north-western façade fronting onto Calthorpe Street. The south-eastern elevation fronting onto Calthorpe Street Gardens is stepped, whilst the other elevations of Building H are more uniform. The two rectangular blocks within Building J, which are connected by a series of elevated walkways and a courtyard, correspond with the lower part of Building H, with a maximum height of 33.11m AOD (including roof plant). Building K, at a similar height to Building J, rises to 35.14m AOD (including roof plant).

Table 5.3: Proposed Building Heights within the Calthorpe Street Development

Building I.D.	Minimum Height (m AOD)**	Minimum Number of Storeys Above Ground*	Maximum Height (m AOD)**	Maximum Number of Storeys Above Ground*
E	55.00	10	62.10	12
F	44.40	7	51.68	9
G	41.37	5	44.37	6
H	33.63	4	46.53	8
J	33.11	4	33.11	4
K	35.14	3	35.14	3

* including ground floor
** heights shown in Table 5.3 include any rooftop plant / parapets.

Phoenix Place Development

5.22. As shown on Phoenix Place planning application drawings 11159-P1-00-100, 11159-P1-00-200 and in Table 5.4, Building A forms a 'U'-shape and comprises a series of stepped vertical tiers rising in height along each elevation, particularly along Mount Pleasant and Phoenix Place. Heights range from 34.45m AOD to 63.28m AOD (including roof plant) along Mount Pleasant and 34.45m AOD to 56.83m AOD (including roof plant) along Phoenix Place. Along the elevation fronting onto Gough Street, the heights range between 43.93m AOD to 63.28m AOD (including roof plant). The highest element of Building A, which responds to surrounding buildings, is located in the lowest part of the Phoenix Place site.

5.23. The elevations of Building A are stepped, with some vertical tiers set back from the surrounding road to reduce the massing. The upper two storeys of Building A are also set back from the lower elevations to create apartments with terraces at roof level.

5.24. As detailed in Table 5.4, Buildings B and C in the northern part of the Phoenix Place site are of similar massing, with the heights rising to a maximum of 53.34m AOD and 46.89m AOD (including roof plant), respectively. Building D is slightly lower with the heights ranging from 35.20m AOD to 38.18m AOD (including roof plant), with the high element forming the southern part of the building. In contrast to Building A, the elevations of Buildings B, C and D are relatively straight and uniform.

Table 5.4: Proposed Building Heights within the Phoenix Place Development

Building I.D.	Minimum Height (m AOD)	Minimum Number of Storeys Above Ground	Maximum Height (m AOD)	Maximum Number of Storeys Above Ground
A	31.23	5	63.28	15
B	53.34	10	53.34	10
C	46.89	8	46.89	8
D	35.20	5	38.18	6

* including ground floor
** heights shown in Table 5.4 include any rooftop plant / parapets.

Basements

Calthorpe Street Development

5.25. As part of the Enabling Works on the Calthorpe Street site, which would be undertaken as the first phase of the Calthorpe Street Development, a new lightweight acoustic roof would be constructed between the first floor level (north-western elevation) of the Sorting Office to Buildings E, F and G over the existing loading bays. The construction of the new lightweight acoustic roof would enclose the ground level service yard above the existing basement (Loading Dock), with finished floor levels at 19.30m AOD and 20.20m AOD. This ground level service yard would contain the loading and unloading of Heavy Good Vehicles, parking spaces, re-fuelling and maintenance facilities. The new lightweight acoustic roof would be over the existing operational area of the Mount Pleasant Sorting office and thus there would be no change in the use or area of operational activity.

5.26. A new ramp structure and ground level slab would be built over part of the *Bathtub* creating a platform to construct Buildings G, E and F and The Gardens. The consequently formed basement area extends beneath The Gardens, beneath Buildings E and F, and part of Building G, as shown on Calthorpe Street planning application drawings 00_07_119 and 00_07_301. The new basement area is linked to the existing basement extends beneath the service yard and continues

beneath the adjacent Mount Pleasant Sorting Office, which is outside of the Site and thus does not form part of the Enabling Works. The finished floor level of this basement would vary between 14.00m AOD and 14.75m AOD.

5.27. A separate but adjoining single storey basement would extend beneath Buildings H, J and K, from Farringdon Road to Phoenix Place, as shown on Calthorpe Street planning application drawings 00_07_306 and 00_07_139, which would provide 5,024m^2 Gross Internal Area (GIA) of floorspace. This basement is formed from the northern part of the existing *Bathtub* and a new extension to this towards Calthorpe Street. Owing to the underground infrastructure beneath the Calthorpe Street site (Mail Rail tunnels) the basement beneath Buildings H, J and K would have a finished floor level of 14.55m AOD, which reflects the existing surface level of the Bathtub. The extended part of this basement would be used for plant and lower ground residential and the existing part will be used for plant, cycle storage and residential car parking; further details of which are provided later in this Chapter.

Phoenix Place Development

5.28. As shown on the Phoenix Place planning application drawings 11159-P1-00-098 and 11159-P1-00-099, a two-storey basement would extend beneath Building A; the lowest level basement which would accommodate the Royal Mail staff parking, also extends under the Square P. The finished floor levels of the lower basement level would be at 8.10m AOD and the upper basement at 12.45m AOD. A separate basement would be created beneath Buildings B and C and the communal garden, as shown on the Phoenix Place planning application drawings 1660_P2_(00)_P100. The basement within this part of the Phoenix Place Development would have a finished floor level of 15.80m AOD and 17.50m AOD. In total, the Phoenix Place Development would provide a total of 10,219m^2 GIA of basement floorspace.

Land Uses

Entire Development (Development Scenario 1)

5.29. The Entire Development (Development Scenario 1) would provide residential (Use Class C3), office (Use Class B1), and flexible retail and community space (Use Classes A1, A2, A3, D1 and / or D2).

Residential Uses

5.30. The Entire Development comprises a significant level of new residential units. The precise mix, tenure split and level of affordable housing provision is subject to on-going viability testing and may change through the course of the applications being determined by LBC and LBI.

5.31. The Entire Development would accommodate 681 residential units, providing 76,738m^2 GIA of residential floorspace. The residential units would be accommodated in Buildings A, B, C, D, E, F, H, J and K; further details of which are provided below. Subject to the viability assessment to be agreed, of the 681 residential units, 132 would be affordable (intermediate and social rented tenure). A breakdown of the composition and tenure of the residential units for the Entire Development is presented in Table 5.5 and further details are provided later in this Chapter.

Table 5.5: Provision of Residential Units for the Entire Development

Residential Units by Tenure	Studio	One-bed	Two-bed	Three-bed	Four-bed
Private Units	5	143	322	71	8
Intermediate Units	0	32	18	5	0
Social Units	0	1	24	35	17
Total	**5**	**176**	**364**	**111**	**25**

Flexible Retail and Community Uses

5.32. The Entire Development would include the provision of flexible retail and community use (Use Classes A1, A2, A3, D1 and / or D2), totalling 2,250m^2 GIA of floorspace. The retail uses could be accommodated on the ground floor in Buildings A and C within the Phoenix Place Development and on the ground floor in Buildings E, F, H, J and K within the Calthorpe Street Development. Similarly, community uses could be accommodated on the ground floor in Building A within the Phoenix Place Development and on the ground floor in Buildings E, F, H, and J within the Calthorpe Street Development. Further details of the proposed retail and community uses are provided later in this Chapter.

Office Uses

5.33. The Entire Development would include the provision of 4,260m^2 GIA of office space. The office space would be provided in Building G within the Calthorpe Street Development. Office floorspace would be accommodated on the ground floor through to the fourth floor of Building G. The entrance to the office space would be from the Farringdon Road and Calthorpe Street Gardens.

Calthorpe Street Development (Development Scenario 2)

Residential Uses

5.34. The Calthorpe Street Development would include the provision of 336 residential units, providing 38,014m^2 GIA of residential floorspace within Buildings (E, F, H, J and K). Subject to the viability assessment to be agreed, of the 336 residential units, 66 residential units would be affordable (intermediate and social rented tenure). The precise mix, tenure split and level of affordable housing provision is subject to on-going viability testing and may change through the course of the applications being determined by LBC and LBI. A breakdown of the composition and tenure of the residential units for the Calthorpe Street Development is presented in Table 5.6.

Table 5.6: Provision of Residential Units for the Calthorpe Street Development

Residential Units by Tenure	Studio	One-bed	Two-bed	Three-bed	Four-bed
Private Units	0	68	160	37	5
Intermediate Units	0	17	11	0	0
Social Units	0	0	18	4	16
Total	**0**	**85**	**189**	**41**	**21**

5.35. Within Buildings H and J, the residential units would be provided on the ground floor, up to, and including the seventh and third floors above the ground floor, respectively. Within Buildings E, F and K, the residential units would be provided from the first floor (above the ground floor) up to, and including the eleventh, eighth and second floors above the ground floor, respectively.

5.36. Entrances to the residential units within Buildings E, F and K would be from Calthorpe Street Gardens, whilst entrances to Building H would be from The Garden and Calthorpe Street. Entrances to Building J would be from the internal courtyard.

Flexible Retail and Community Uses

5.37. Of the total 2,250m^2 GIA of flexible retail and community floorspace, the Calthorpe Street Development would provide 1,428m^2 GIA (Use Classes A1, A2, A3, D1 and / or D2). Five separate units for flexible retail and community use would be provided at ground level fronting onto The Garden within Buildings E and F. Further flexible retail and community use in four separate units would be provided within Buildings H and J. Within Building H, the flexible retail and community use at ground level would front onto Farringdon Road and that within Building J would front Square P adjacent to Phoenix Place. Additional flexible retail uses (Use Classes A1, A2 and / or A3) would be provided at ground level within Building K.

Office Uses

5.38. The Calthorpe Street Development would accommodate the entire provision of office space (as detailed above) as none would be provided within the Phoenix Place Development.

Basement Uses

5.39. As shown on Calthorpe Street planning application drawing 00_07_139, the new part of the basement beneath Buildings H and J would accommodate plant rooms, an energy centre, ground source heat pump, rainwater storage tanks, waste storage rooms, lower ground residential. The existing part of the basement would accommodate residential parking and the cycle store room. The basement would accommodate 65 car parking spaces for the residents of the Calthorpe Street Development, of which 17 car parking spaces would be allocated to disabled parking and 13 car parking spaces would have electric charging points (20% of total).

5.40. The adjoining basement beneath The Garden and Buildings F and G (see Calthorpe Street planning application drawing 00_07_119), together with enclosing the Loading Dock at ground level (created by the inclusion of a new acoustic roof), would accommodate the delivery and servicing yard operations associated with the Sorting Office. The basement would include vehicle parking spaces, plant and accessed by smaller delivery vehicles. However, the new lightweight acoustic roof would be over the existing operational area of Mount Pleasant Sorting office and thus there would be no change in the use or area of operational activity. Vehicular access to this basement and the Loading Dock would be from Farringdon Road through Building G.

5.41. The construction of the new lightweight acoustic roof (as described above) would create an enclosed service yard above the basement (Loading Dock) at ground level. This would contain the loading and unloading of Heavy Good Vehicles, parking spaces, re-fuelling and maintenance facilities. Part of this area would be accommodated by a ventilation system, whereby the service yard extract would be combined in a dedicated zone and transferred horizontally, venting to open air.

Phoenix Place Development (Development Scenario 3)

Residential Uses

5.42. The Phoenix Place Development would include 345 residential units, providing 38,723m^2 GIA of residential floorspace within Buildings A, B, C and D. Subject to the viability assessment to be agreed, of the 345 these, 66 would be affordable (intermediate and social rented tenure). The precise mix, tenure split and level of affordable housing provision is subject to on-going viability testing and may change through the course of the applications being determined by LBC and LBI. A breakdown of the composition and tenure of the residential units for the Phoenix Place Development is presented in Table 5.7.

Table 5.7: Provision of Residential Units for the Phoenix Place Development

Residential Units by Tenure	Studio	One-bed	Two-bed	Three-bed	Four-bed
Private Units	5	75	162	34	3
Intermediate Units	0	15	7	5	0
Social Units	0	1	6	31	1
Total	**5**	**91**	**175**	**70**	**4**

5.43. Within Buildings A, B and D, residential uses would be provided on the lower ground floor up to and including the fourteenth, ninth and fifth floors above the lower ground floor, respectively. Within Building C, the residential units would be provided from the upper ground level up to and including the sixth floor above the upper ground level.

5.44. Entrances to the residential units within Building A would be from Phoenix Place, Mount Pleasant and Gough Street, together with from the internal courtyard, whilst residential entrances to Buildings B and C would be from the newly created Square P. The residential units within Building D would be from a walkway off Phoenix Place.

Flexible Retail and Community Uses

5.45. Of the total 2,250m^2 GIA of flexible retail and community floorspace, the Phoenix Place Development would provide 822m^2 GIA (Use Classes A1, A2, A3, D1 and / or D2). Five separate units for flexible retail and community use would be provided at lower ground level fronting onto Mount Pleasant within Building A. A further flexible retail use (Use Classes A1, A2 and / or A3) unit would be provided within Building C at the lower ground level.

Basement Uses

5.46. As shown on Phoenix Place planning application drawings 11159_P1_00_098 and 11159_P1_00_099, the basement beneath Building A would accommodate plant rooms, ground source heat pumps, an energy centre, waste storage rooms, cycle stores, together with car parking spaces. Within the lower part of this basement, 200 car parking spaces would be provided for staff of the adjacent Mount Pleasant Sorting Office and in the upper part of the basement, 29 car parking spaces for residents of the Phoenix Place Development, of which 11 car parking spaces would be allocated to disabled parking.

5.47. The basement beneath Buildings C and D, part of Building B, and beneath Phoenix Square and the play area would also accommodate waste storage rooms, rainwater storage tanks, a cycle store and residential car parking. This part of the basement would accommodate eight car parking spaces for the residents of the Phoenix Place Development, of which six spaces would be disabled parking. The cycle store would accommodate 276 cycle spaces.

Materials, Façade Treatment and Finishes

Calthorpe Street Development

The architectural treatment and appearance of the buildings in the Calthorpe Street Development has been developed based on the surrounding buildings. A palette of high quality complementary materials would be used to all buildings to ensure the high quality.

5.48. Brick would form the primary cladding material to the building facades, which would be of different shades. Horizontal elements of composition such as window lintels, expressed slabs and projecting balconies would be made of reconstituted stone, which would be light in colour to contrast to the solidity of the brick facades. The rear walls of the recessed balconies, the upper level window surrounds and rooftop parapet capping are also proposed to be clad in this material in order to break up the consistency of the brick. Large areas of glazing are required in order to achieve the high levels of daylight in the residential units. The glazing would typically be triple glazed in order to achieve the optimal thermal performance. Metal elements would include recessed balconies, horizontal shades to the typical window bays, vertical fin and solid panel balustrades. Stained timber boards would be used on roof terrace decks, balconies, and landscape features.

Phoenix Place Development

5.49. In response to the surrounding buildings, the external façade material of Building A would predominately comprise brick. The same brick type would be used for all external façades, whilst a lighter brick would be used in the internal courtyard. Reconstituted stone would be used to express important details and revealed as an inner layer of material behind the brickwork, such as along the inside of balconies, commercial frontages and for residential entrance portals. The ground floor would be clad in stone to differentiate the commercial uses and residential entrances from the residential uses above. Set into the brick of Building A would be balconies expressed as two storey zones alternating between brick and metal material, regular grid windows and large ground floor openings comprising triple glazing.

Amenity Space

Calthorpe Street Development

5.50. The provision of public amenity space, together with communal and private amenity space for the Calthorpe Street Development, is summarised below and in Table 5.8. The amenity spaces within the Calthorpe Street Development would be provided in the form of courtyards, roof terraces, The Gardens and Square C.

Table 5.8: Provision of Amenity Space with the Calthorpe Street Development

Amenity Type	Quantum (m^2)
Public Space	5,124
Communal Space	3,014
Private Space	817
Roof Terraces	785
Private Balconies	2,665

Public Amenity Space

5.51. The Calthorpe Street Development would create 5,124m^2 of public open space at ground level accessible to the general public and residents of the Calthorpe Street Development. This would be in the form of The Garden, a public square (Square C) between Buildings E, J and K and pavements within the Calthorpe Street Development, which would provide important pedestrian linkages through the Calthorpe Street Development.

Communal and Private Amenity Space

5.52. In total, 3,831m^2 of communal and private amenity space would be provided in the Calthorpe Street Development, of which 3,014m^2 would be private communal space. Secure communal amenity space accessible to the residents of the Calthorpe Street Development would be provided at ground level within the internal courtyard of Building H and at the second floor level behind Buildings E, F and G. In addition, private communal roof terraces accessible to selected residential units would be available within Buildings H and J. Private amenity space accessible to residents would also be provided within the Calthorpe Street Development in the form of balconies within Buildings E, F, H, J and K. Private roof terraces accessible to individual residential units would be created at various levels within Buildings E, F, H and K.

Phoenix Place Development

5.53. The provision of public amenity space, together with communal and private amenity space for the Phoenix Place Development, is summarised below and in Table 5.9. The amenity spaces within the Phoenix Place Development would be provided in the form of courtyards, Square P, roof terraces and balconies.

Table 5.9: Provision of Amenity Space with the Phoenix Place Development

Amenity Type	Quantum (m^2)
Public Space	1,820
Communal Space	2,687
Private Space	676
Roof Terraces	785
Private Balconies	2,2,364

Public Amenity Space

5.54. The Phoenix Place Development would create 1,820m^2 of public open realm accessible to the general public and residents of the Phoenix Place Development. The majority of the public open realm would be provided in Square P located between Buildings A, B and C.

Communal and Private Amenity Space

5.55. Secure communal amenity space accessible to the residents of the Phoenix Place Development would be provided at ground level within the internal courtyards of Building A and between Buildings B, C and D. In addition, private communal roof terraces accessible to selected residential units would be available within Buildings A, B and C. Outdoor communal amenity space within the Phoenix Place Development would total 2,687m^2.

5.56. Private amenity space accessible to individual residents of the Phoenix Place Development would also be provided within the Building A in the form of balconies and winter gardens within Buildings B, C and D in the form of balconies. Private amenity space at ground level would total 676m^2, with a further 2,364m^2 provided in the form of balconies.

Landscaping

Calthorpe Street Development

5.57. The public amenity space within the Calthorpe Street Development would comprise a combination of hard and soft landscaped areas, as shown in planning application drawing 00_07_602_A0. Paved areas would include a combination of granite (along The Lane located between Building H and J, as shown on Figure 5.1), york stone and clay brick paving. Soft landscaped areas within The Garden and the private communal area at ground level within the internal courtyard would comprise lawn, shrub and perennial planting, together with raised planting beds. Raised planting beds and trees would also be created within the private communal area between to the south-east of Buildings E and F. Trees would be planted throughout the Calthorpe Street Development, particularly along The Garden and The Lane.

5.58. Private and communal roof terraces within the Calthorpe Street Development would comprise a combination of paving and timber decking. Sedum green roof would be provided on Building H and on the lightweight acoustic roof constructed along the northern elevation of the Mount Pleasant Sorting Office. The lightweight acoustic roof would provide 4,910m^2 of soft landscaping that would not be accessible to either the residents or the general public.

Phoenix Place Development

5.59. In common with the Calthorpe Street Development, public and private communal amenity space within the Phoenix Place Development at ground level would comprise a combination of hard and soft landscaped areas, as shown on planning application drawing 00_07_602_A0. Paved areas would include a combination of york stone and clay brick paving. Soft landscaped areas within Square P and the internal courtyard of Building A would comprise lawn, shrub and perennial planting, together with raised planting beds. Trees would be planted throughout the Phoenix Place Development, particularly along Mount Pleasant and within Square P, and the internal courtyard within Building A.

5.60. Communal roof terraces within the Calthorpe Street Development would comprise a combination of paving and timber decking. Green and brown roofs would be created on Building A and a green sedum roof on Building D.

Access, Parking and Servicing

Calthorpe Street Development

5.61. To improve pedestrian permeability between the Site and the surrounding areas, the Calthorpe Street Development would create new pedestrian links. The creation of The Garden would form a significant pedestrian link connecting neighbourhoods to the north-east of the Site to the neighbourhoods to the south-west. Pedestrian links to the Calthorpe Street Development would also be created in a north-west to south-east direction, linking Calthorpe Street with The Garden.

5.62. The Calthorpe Street Development would provide a total of 65 car parking spaces for the residents of Buildings E, F, H, J and K, all of which would be provided within the basement. Two one-way car lifts would also be accommodated towards the centre of the basement with vehicular access / egress within Building H via The Lane (located between Building H and J) which would be accessed from Calthorpe Street. No car parking is proposed for the commercial units.

5.63. The Calthorpe Street Development would include the provision of 441 cycle spaces for the residents of Buildings E, F, H, J and K within the basement. A further 40 cycle spaces would be provided for visitors and 44 cycle spaces provided for the commercial units.

5.64. All vehicular movements associated with the Mount Pleasant Sorting Office would access and egress the Loading Dock and basement from a separate entrance along Farringdon Road. This would enable the operations to be contained and separated from the residents and users of the Calthorpe Street Development.

Phoenix Place Development

5.65. The north-east to south-west pedestrian link along The Garden within the Calthorpe Street Development would continue across the Phoenix Place Development, through the creation of a pedestrian link along Phoenix Square (known as Coley Walk). Coley Walk would connect Phoenix Place with Gough Street.

5.1. The Phoenix Place Development would provide a total of 54 car parking spaces for the residents of Buildings A, B, C and D, all of which would be provided within the basement. Approximately 200 car parking spaces would be provided in the Phoenix Place Development for the staff of the Mount Pleasant Sorting Office. These, however, replace the surface level parking that is currently available at the Phoenix Place site. Access and egress to the residential car parking within the basement would be from Phoenix Place, whilst vehicular access and egress to the basement accommodating car parking spaces for the staff of Mount Pleasant would be provided separately from the lower ground level off Gough Street.

5.2. The Phoenix Place Development would include the provision of 431 cycle spaces for the residents of Buildings A, B, C and D, all of which would be provided in the basement. A further 36 residential visitor cycle spaces and seven commercial cycle spaces would be provided.

5.3. A Barclays Cycle Hire docking station comprising 50 cycles would also be provided along Mount Pleasant (east of Phoenix Place).

Plant, Equipment and Utilities

Calthorpe Street Development

5.4. The majority of plant and equipment associated with the Calthorpe Street Development would be located in the basement beneath Buildings H and J, which would include an energy centre, ground source heat pumps, rainwater and greywater recycling plant and generators. In addition, electricity substations and cooling plant would be accommodated on the ground floor and roof top of Building H. Electricity substations would also be located at ground level of Buildings E and F. Roof-top plant, including air handling rooms and extraction plant would be provided on Building G.

Phoenix Place Development

5.5. In common with the Calthorpe Street Development, the majority of plant and equipment, such as an energy centre, generators, vent rooms, ground source heat pump, water cooled chillers, ventilation, rainwater harvesting and irrigation plant, would be accommodated within the basements. However, roof-top plant would also be accommodated on Buildings B and C.

Drainage

Calthorpe Street Development

5.6. At present, the Calthorpe Street site is largely covered in hard-standing and therefore rainwater runoff is currently drained into the existing sewer network.

5.7. To attenuate rainwater runoff, the Calthorpe Street Development would incorporate attenuation tanks or geo-cellular storage units located in the basement. These attenuation tanks would be designed to achieve 400m^3 of storage, which would meet the London Plan[2] Essential Standard. It is proposed that stored rainwater would be used for irrigating the soft landscaped areas, with any surplus discharged into the existing sewer network. Rainwater runoff from the proposed hard and soft landscaped areas would be discharged via linear drainage systems into the main external surface water sewer network.

Phoenix Place Development

5.8. The Phoenix Place site is covered with compacted fill material and broken concrete, and therefore rainwater runoff is currently drained into the network of combined sewers.

5.9. To attenuate rainwater runoff, the Phoenix Place Development would incorporate attenuation tanks or geo-cellular storage units located in the basement. These attenuation tanks would be designed to achieve 180m^3 of storage, which would meet the London Plan Essential Standard. As for the Calthorpe Street Development stored rainwater would be used for irrigating the soft landscaped areas with any surplus discharged into the existing sewer network. Rainwater runoff from the proposed hard and soft landscaped areas would be discharged via linear drainage systems into the main external surface water sewer network.

Waste Management

5.10. A summary of the proposed waste management provisions for the Calthorpe Street and Phoenix Place Developments is provided below, with further details set out in the Operational Waste Strategies which accompany the planning applications.

Calthorpe Street Development

5.11. Residential waste from Buildings H, J and K would be segregated within the dwellings according to the waste and recycling containers provided in the waste container stores, which would be located in the basements of these buildings. A total of 86 1,100 litre storage bins and 13 360 litre food storage bins would be accommodated, of which 50% of the waste container storage would be allocated to recycling.

5.12. Waste would be transferred via lifts to the waste container stores prior to being transferred to ground level on collection days. For the residential units in Buildings E and F, the waste container stores would be located at ground level. A building management company would be responsible for the management the waste container stores.

5.13. Waste generated by the retail and / or community uses would be segregated and stored within the units and transferred outside on collection days. However, owing to Building G fronting onto Farringdon Road, office waste would be stored in a secure designated waste container store located at ground level in Block G and F. Elsewhere, retail and / or community uses waste would be segregated and stored within the units and transferred outside on collection days.

Phoenix Place Development

5.14. As for the Calthorpe Street Development, residential waste from Buildings A, B, C and D would be segregated within the dwellings according to the waste and recycling containers provided in the waste container stores, which would be located in the basement and on the ground floor level of Building A, and on the lower ground floor of Buildings B, C and D. A total of 89 1,100 litre storage bins and nine 500 litre food storage bins would be accommodated, of which 30% of the waste container storage would be allocated in recycling. Waste would be transferred via lifts to the waste container stores prior to being transferred to ground level (either on Gough Street or Phoenix Place) on collection days. Waste generated by the retail and / or community uses would be segregated and stored within the units and transferred outside on collection days.

Sustainable Features

5.15. All Development Scenarios would be designed to create a sustainable development and ensure high environmental performance. The Sustainability Statement and Energy Statement prepared by Hoare Lea, and which have been submitted separately to accompany the application applications, provide details of the sustainable measures considered. A summary of the key targets and sustainable design measures is provided below.

- The residential units would be designed to achieve Code for Sustainable Homes Level 4, whilst non-residential buildings would be designed to target a minimum of BREEAM 2011 rating of Very Good;
- Overall, the regulated CO_2 emissions target for both the Calthorpe Street Development and the Phoenix Place Development would be between 35% to 38% improvement on Part L 2010;
- An 8% improvement on 2010 Building Regulations is being targeted in relation to passive design and energy efficiency. Overall, CHP plant is predicted to result in CO_2 savings of between 25% and 30% (regulated emissions). Low or Zero Carbon (LZC) sources would be incorporated where feasible, which is predicted to represent a further 1% to 7% saving on regulated CO_2 emissions;

- Internal water use in all dwellings would be a maximum of 105 litres / person / day or less, in line with Code for Sustainable Homes Level 4 requirements and the London Plan 2011. Water demand reductions would be achieved through the specification of water efficient fittings and appliances. All the residential units would be metered;
- Rainwater harvesting and greywater recycling plant within both the Calthorpe Street Development and Phoenix Place Development; and
- Green roofs within the Calthorpe Street Development and green and brown roofs within the Phoenix Place Development.

References

1 London Borough of Camden, London Borough of Islington, 2011, Mount Pleasant Supplementary Planning Document, October 2011.

2 The Mayor of London (2011); The London Plan 2011: Spatial Development Strategy for Greater London, Greater London Authority.

6. Development Programme, Demolition and Construction

Introduction

6.1. This Chapter was prepared by MACE, the construction advisors for the project, with input from Waterman Energy, Environment & Design Ltd (Waterman EED) and Davis Langdon, the project quantity surveyors. It sets out the anticipated programme of the demolition and construction works for the likely three Development Scenarios (described below), together with the key activities that would likely be undertaken on both the Calthorpe Street site and the Phoenix Place site.

6.2. A summary of the likely significant environmental effects arising from the demolition and construction works is also provided in this Chapter. Detailed assessments of the likely significant effects resulting from the demolition and construction works associated with the three Development Scenarios following the implementation of mitigation measures (where required), are presented in the technical chapters of this ES (Chapter 7 to Chapter 16 inclusive).

6.3. Programming for demolition and construction is necessarily broad at this stage and may be subject to modification; specific demolition and construction activities may vary in frequency, depending upon the particular stage of works. However, this Chapter sets out the anticipated programme and key construction activities associated with the following three Development Scenarios:

- Development Scenario 1: the Entire Development (i.e. Calthorpe Street Development (including the Enabling Works) and Phoenix Place Development);
- Development Scenario 2: Calthorpe Street Development (including the Enabling Works); and
- Development Scenario 3: Phoenix Place Development.

6.4. It is considered that sufficient planning has taken place to enable the likely significant environmental effects relating to the demolition and construction works to be identified and assessed.

6.5. As set out in Chapter 2: *EIA Methodology*, the modernisation and refurbishment of Mount Pleasant Sorting Office is scheduled for completion by the end of 2013, and prior to the commencement of the demolition and construction works described in this Chapter. However, the demolition and construction programme, together with the sequence of the key activities, particularly in relation to the Calthorpe Street site, takes account of the requirement to allow for the 24-hour operations of the Mount Pleasant Sorting Office.

6.6. Construction Environmental Management Plans (CEMP) would be prepared post-determination and implemented during the demolition and construction works for both the Calthorpe Street site and the Phoenix Place site (i.e. for each Development Scenario). The CEMP's would take account of guidance provided by the London Borough of Camden (LBC) and the London Borough of Islington (LBI) in *Guide for Contractors Working in Camden*[1] and *Code of Practice for Construction Sites*[2] respectively.

Programme of Works

6.7. It is anticipated that the entire Site would be comprehensively redeveloped, although either the Calthorpe Street site or the Phoenix Place site could be developed in isolation. The Enabling Works on the Calthorpe Street site (as described later in this Chapter) would be undertaken as the first phase of the redevelopment of the Calthorpe Street and therefore would only likely be undertaken if Development Scenario 1 or 2 proceeds.

6.8. The anticipated programme for each of the Development Scenarios is presented below and shown on Figure 6.1, with respect to any phasing:

- Development Scenario 1 – 5 years 4months (Q2 2015 to Q2 2020);
- Development Scenario 2 – 4 years 4 months (Q3 2014 to Q3 2018); and
- Development Scenario 3 – 3 years 9 months (Q2 2015 to Q4 2018).

6.9. The anticipated programme of key stages of work proposed for each Development Scenario is set out in Table 6.1. It is important to note that some of the activities would be on-going simultaneously in order to achieve the indicative demolition and construction timetable.

Table 6.1: Indicative Programme of Key Demolition and Construction Activities for the Development Scenarios

Development Scenario	Anticipated Commencement Date	Anticipated Completion Date	Approximate Duration (months)
Development Scenario 1			
Enabling Works Calthorpe Street site.	Q4 2015	Q2 2017	21
Demolition on Phoenix Place site.	Q2 2015	Q3 2015	3
Construction (sub and superstructure) of Calthorpe Street Development.	Q4 2017	Q4 2019	28
Fit-out of the Calthorpe Street Development.	Q1 2018	Q2 2020	31
Landscaping and External Works of the Calthorpe Street Development.	Q2 2018	Q2 2020	26
Construction (sub and superstructure) of Phoenix Place Development.	Q3 2015	Q1 2018	31
Fit-out of the Phoenix Place Development.	Q2 2016	Q4 2018	30
Landscaping and External Works of the Phoenix Place Development.	Q2 2017	Q4 2018	18
Development Scenario 2			
Enabling Works on Calthorpe Street site.	Q3 2014	Q1 2016	21
Construction of (sub and superstructure) Calthorpe Street Development.	Q4 2015	Q1 2018	30
Fit-out of the Calthorpe Street Development.	Q2 2016	Q3 2018	29
Landscaping and External Works of the Calthorpe Street Development.	Q3 2016	Q3 2018	19
Development Scenario 3			
Demolition on Phoenix Place site.	Q2 2015	Q3 2015	3
Construction (sub and superstructure) of Phoenix Place Development.	Q3 2015	Q1 2018	32
Fit-out of the Phoenix Place Development.	Q2 2016	Q4 2018	31
Landscaping and External Works of the Phoenix Place Development.	Q2 2017	Q4 2018	17

6.10. Supplementing Table 6.1 above, Table 6.2 below and Figure 6.1 provides an indicative sequence of works for all Development Scenarios, identifying the likely key works that would take place in that period. Figure 6.2 presents an outline indicative sequence of works for Development Scenario 1.

Table 6.2: Indicative Sequence of Works for the Development Scenario 1

Period	Calthorpe Street Enabling Works	Phoenix Place Phase 1 (see Figures 5.1 and 6.1)	Phoenix Place Phase 2 (see Figure 6.1)	Calthorpe Street Phase 3 (see Figure 6.1)	Calthorpe Street Phase 4 (see Figure 6.1)
Year 1 Q1 to Q2	Utility diversions and disconnections	Utility diversions and disconnections; Site set-up (hoardings and gates); Structural demolition to grade; Breakout / pile probe and site enablement; Pile installation and construct perimeter retaining wall			
Year 1 Q3 to Q4	Surveys undertaken; Site set-up (hoardings and gates); Sorting Office internal remodelling works; Piling / founds / structure on adjacent Mount Pleasant Sorting Office for new lightweight weight roof	Excavate basement; Install temporary work; Substructure construction up to ground in progress;			
Year 2 Q1 to Q2	Sorting Office Stage 2 works in progress –new ramp access and new access road to existing delivery/service yard at Mount Pleasant Sorting Office	Frame construction to Block A almost complete; Substructure construction to Buildings C and D in progress; Façade works to Building A in progress; Internal fitout to Building A to commence.			
Year 2 Q3 to Q4	Sorting Office Stage 2 works complete during this period. Sorting Office Stage 3	Façade works to Building A in progress; Balcony installation in progress. Internal fitout and residential fitout to Building A in progress.	Breakout / pile probe and site enablement; Install piles and basement retaining wall;		Utility diversions and disconnections still in progress

Period	Calthorpe Street Enabling Works	Phoenix Place Phase 1 (see Figures 5.1 and 6.1)	Phoenix Place Phase 2 (see Figure 6.1)	Calthorpe Street Phase 3 (see Figure 6.1)	Calthorpe Street Phase 4 (see Figure 6.1)
	works in progress – New lightweight roof and Sorting Office basement car park cover deck under construction; Erect mini-tower cranes on completed Sorting Office ramp tunnel roof for installation of roof structure.		Excavate basement. .		
Year 3 Q1 to Q2	Sorting Office Stage 3 works in Complete – New lightweight roof and Sorting Office basement car park cover deck	Internal fitout and residential fitout in progress to all blocks within Building A. External works – progress completion to Phase 1 works,	Substructure works complete; Frame construction to Buildings B and D almost complete; Building C frame in progress; Façade and internal works to Buildings D and C in progress.		Utility diversions and disconnections still in progress
Year 3 Q2 to Q4		. Internal fitout and residential fitout in progress to all blocks within Building A. External works – progress completion to Phase 1 works	Residential fitout to Buildings C , B and D in progress; Frame and façade works in progress to all Buildings	;	Frame construction to Buildings F and G in progress
Year 4 Q1 to Q2		Building A (Phase 1) complete, including external works.	Frame and Façade works to all Buildings complete; Internal and residential fitout in progress to all Buildings;	Substructure and superstructure frame works to Building H in	Frame and Façade works to Buildings F and G complete;

Period	Calthorpe Street Enabling Works	Phoenix Place Phase 1 (see Figures 5.1 and 6.1)	Phoenix Place Phase 2 (see Figure 6.1)	Calthorpe Street Phase 3 (see Figure 6.1)	Calthorpe Street Phase 4 (see Figure 6.1)
			External works to Phase 2 to commence.	progress	Building F - residential fitout and commissioning works in progress; Building G complete; External works in progress.
Year 4 Q3 to Q4				Building H – frame ; façade and internal fitout works in progress; Building J – facade works and internal fitout works in progress; Building K - frame and façade complete ; internal fit out in progress	Building F - residential fitout and commissioning works in progress. Building E - residential fitout complete and commissioning in progress;
Year 5 Q1 to Q2				Building H – façade and residential fitout works in progress; Building J – facade works complete and internal fitout works + commissioning in	Building F - residential fitout and commissioning works in progress.

Period	Calthorpe Street Enabling Works	Phoenix Place Phase 1 (see Figures 5.1 and 6.1)	Phoenix Place Phase 2 (see Figure 6.1)	Calthorpe Street Phase 3 (see Figure 6.1)	Calthorpe Street Phase 4 (see Figure 6.1)
				progress; Building K – complete; External Works to Buildings J and K in progress.	External works in progress.
Year 5 Q3 to Q4				Buildings J and K works complete, including associated external works; Façade and residential fitout to Building H works in progress; Phase 3 works complete – Q4; Year 5	Phase 4 works complete – Q3; Year 5
Year 6 Q1 to Q2				Building H works complete; Phase 3 works complete – Q2; Year 6	

Description of the Works

Pre-commencement Surveys

6.11. Owing to the historical development of the Site, any buried heritage assets present would likely have been subject to a degree of truncation. The main potential for buried heritage assets relates to palaeoenvironmental deposits beneath the western and northern parts of the Site, associated with the varied courses of the former Fleet River. A programme of palaeoenvironmental and geoarchaeological investigation would be undertaken in advance of demolition and construction works associated with the redevelopment of the Site. Archaeological monitoring and recording during the groundworks would be undertaken to record any other buried heritage assets that may have survived historical truncation.

6.12. A detailed Site Investigation (SI) would be undertaken prior to the commencement of construction of the Calthorpe Street Development or the construction works on the Phoenix Place site to determine the presence of any contaminated ground / groundwater. Should any unacceptable risks be identified through the interpretation of the SI, a Remediation Strategy would be developed, agreed with the relevant authorities, and implemented.

6.13. Further details of the archaeological potential and ground conditions of the Site are provided in and Chapter 12: *Archaeology* and Chapter 13: *Ground Conditions and Contamination*, respectively.

Site Preparation Works

6.14. The trees present on the Calthorpe Street site would require removal prior to construction works commencing; see Appendix 3.1 for further details.

6.15. Prior to demolition works commencing, hoardings would be erected around the perimeter of the Calthorpe Street site and the Phoenix Place site, with protective gantries over adjoining pavements as necessary to provide a clear and secure demarcation between operational activities and other areas, and to provide information about the project and its progress. This would be maintained during the construction phase, and would provide visual and light weight screening and ensure the safety of pedestrians and users of the road network. Particular attention would be paid to locations supporting high volumes of pedestrian movement (e.g.: along Farringdon Road), adjacent to demolition and construction routes, access gates and security arrangements. The hoarding would accord with the Health and Safety Executive (HSE) and LBI / LBC requirements and would be well lit and maintained throughout the works to ensure public safety.

6.16. As part of the Enabling Works to Calthorpe Street it would be necessary to remove / relocate and divert some of the existing utilities located within the footprint of the proposed buildings as or when required.

Service Diversions and Protection of Underground Infrastructure

6.17. As described in Chapter 3: *Existing and Future Land Uses*, various items of underground infrastructure associated with the operations of the Mount Pleasant Sorting Office are located beneath the Calthorpe Street site. The Mail Rail tunnels and associated infrastructure such as ventilation shafts extend north-west to south-east across the central and western part of the Calthorpe Street site. Whilst the Mail Rail tunnels are currently not in use, they are to be maintained for future potential uses. One of these potential uses currently under consideration would be a 'mail rail experience' as part of the consented British Postal Museum and Archive (BPMA) (see Chapter 17: *Cumulative Effects*) and therefore would be safeguarded during the demolition, Enabling Works and construction works. In addition, the Fleet River Sewer extends beneath Phoenix on the Phoenix Place site, whilst the Fleet River Sewer Branch extends across the northern part of the Calthorpe Street site.

6.18. Based upon survey data, discussions with Rail engineers, and existing archive information, a minimum horizontal clearance zone of between 1m and 2m would be given for the Mail Rail tunnels and discussions with Thames Water has concluded an exclusion zone of 3m from the Fleet River Sewer and 1m from the Fleet River Sewer Branch, in accordance with the safeguarding guidelines. Specific details of protection of the Fleet River Sewer and Sewer Branch would be agreed with Thames Water as part of an Approval in Principal in the next stages of the design.

6.19. The various below ground infrastructure would be adequately protected both during and after the works in terms of disturbance during the piling installation, load from piles in operation and load transmitted to the infrastructure from the transfer structures via the soil.

Enabling Works

6.20. The Enabling Works would be undertaken as the first phase of the Calthorpe Street Development and is defined as all the works required to facilitate the Calthorpe Street Development and enable the 24 hour operation of the adjacent Mount Pleasant Sorting Office, where vehicles will be loading and unloading at all times of the day and night. The Enabling Works for the Calthorpe Street Development would be undertaken in three main stages, as described below:

- Stage 1:
  - Piling within the existing Mount Pleasant Sorting Office basement for the new lightweight roof;
  - Converting/remodelling of the existing Mount Pleasant Sorting Office basement for future decanted vehicles associated with the Sorting Office;
  - Demolition / relocation of existing Mail Rail escape enclosure – alternative route to be determined;
  - Breakout of existing basement slab and new foundation construction at south-east corner of existing Mount Pleasant Sorting Office basement for the new Building G superstructure frame;
- Stage 2:
  - New access road widening, to the existing Mount Pleasant Sorting Office delivery yard at ground floor and new ramp access structure constructed;
- Stage 3:
  - Demolition of the existing Loading Canopy / Enclosure in conjunction with the construction of the lightweight roof;

- Lightweight over the existing Mount Pleasant Sorting Office delivery vehicle yard at the rear of the building installed;
- Construct part of the new deck, north of Building F over the "*Bathtub*", for basement car parking.

6.21. Since the Enabling Works would only be undertaken on the Calthorpe Street site, such works (as described above) would only be required should either Development Scenario 1 or 2 proceed.

6.22. Shared Site access would be created along the north-eastern boundary of the Calthorpe Street site, off Farringdon Road. This access would be shared during the three main stages of the Enabling Works to with existing vehicle traffic to the Sorting Office and undercroft. Wheel washing facilities would be installed on site, to minimise the transfer of Site-generated soils to the local road network. Separate access gates would be provided for pedestrian and vehicular access into the Site. Where required, suitable security measures would be put into place, including 24 hour security during the latter stages of the construction programme.

6.23. In addition to the above, the existing vehicle entrance to the Calthorpe Street site on Farringdon Road would be moved further south of its current location, a new ramp installed to replace the existing ramps to the north of the undercroft, adjacent Mount Pleasant Sorting Office, and the re-provision of the fuel station and vehicle wash facility.

6.24. With the exception of the Mail Rail tunnels, which would be safeguarded for future use, some of the other existing services would be identified, surveyed, tested and diverted or cut-off as appropriate. Key services and reinstated services would be temporarily protected and weather proofed to ensure a safe clearance.

Demolition

Calthorpe Street Site

6.25. To facilitate the Enabling Works as described above and the construction works on the Calthorpe Street site, a number of existing structures such as the gate pavilion located at the existing entrance off Farringdon Road, the ramps, and the parapets of, the lower level of the Calthorpe Street site (known as the *Bathtub*; further details of which are provided in Chapter 3: *Existing and Future Land Uses*), the Vehicle Wash and the Loading Canopy / Enclosure from the adjacent Mount Pleasant Sorting Office would be demolished along with the workshop and vehicle wash.

Phoenix Place Site

6.26. To facilitate the Phoenix Place Development, the former Mail Rail House (Petrone House) and the buildings to the rear of Calthorpe House, 15 to 20 Phoenix Place would be demolished, together with remnants of the walls across the Phoenix Place site. The demolition would commence with stripping and removal of all internal furnishings. Any asbestos that has been identified would be removed by a specialist contractor, in accordance with relevant legislation. The building would then be demolished from the top down to existing ground floor level on a stepped level by level basis.

6.27. It its envisaged that the demolition would start at the north end of the Site, working towards the southern Site boundary. The demolition clearance works would be taken 3m below the lowest level of the existing building – ground floor.

Excavation Works

Calthorpe Street Site

6.28. The proposed buildings on the Calthorpe Street site would be supported on piled foundations. The Calthorpe Street Development would largely make use of the *Bathtub* to create the basement, which would minimise excavation works on this part of the Site. However, there would be a small extension to the basement to the north and east of the Calthorpe Street site, which would require approximately 1,200m^2 of material to be excavated. Significant transfer slab foundations proposed for the Calthorpe Street Development, under Buildings F, H, J and K (as shown in Figure 5.1) would also require excavations to enable their construction.

Phoenix Place Site

6.29. A reduced dig to create a new basement would be undertaken to create a new basement for the Phoenix Place Development. The proposed buildings would be supported on piled foundations, and the basement would be retained with either contiguous or secant piled walls.

6.30. The final method of excavation would be the responsibility of the appointed Contractor and consideration would be given to the proximity to the Thames Water sewer.

Piling and Substructure

Calthorpe Street Site

6.31. As described in Chapter 3: *Existing and Future Land Uses*, the main underground constraints consist of the now disused Mail Rail and the Fleet River Sewer Branch which extend below a significant part of the Calthopre Street site. In addition, there is an escape staircase and ventilation shaft related to the Mail Rail which currently opens out into the existing *Bathtub*; which these would need to diverted / relocated. This would require establishing a safeguarded zone adjacent to the tunnel and may mean that certain pile shafts would need to be sleeved above the tunnel invert to ensure than no load, in excess of the limits imposed, is applied to the tunnel.

6.32. Owing to the existing underground constraints, the Calthorpe Street Development would rely upon several types of foundations. Piled foundations are proposed for the substructure and it is anticipated that foundations would be conventional large diameter bored piles. For some of the piles, namely those in proximity to existing services or where elements of the new buildings are located above the Mail Rail tunnels, it would be necessary to span over these below ground obstructions using substructure transfers in the form of post- tensioned and reinforced concrete piled rafts.

6.33. The toe of each pile would founded in the London Clay therefore constitutes a low permeability barrier, preventing the creation of any potential pollution pathway to the Principal Aquifer beneath. It is anticipated that the piles would be limited in depth to approximately 32m long. Pile design and installation methodology would be the responsibility of the appointed Contractor.

6.34. Piling during the first stage of Enabling Works would be carried by low head room rigs and / or ‘Martello’ type rigs owing to the working height constraints and to ensure the continued operation of the Mount Pleasant Sorting Office.

6.35. The buildings of the Calthorpe Street Development would be based on a concrete substructure. The basement would be surrounded by a reinforced concrete wall on a basement slab founded on a series of pile caps and piles, except where below-ground constraints are present, and where reinforced concrete walls would be used. The basement would include floor slabs made of reinforced concrete and supported by a number of concrete columns

6.36. The west side of Building J substructure extends to the outside face of the existing Maintenance Depot wall, north of the Calthorpe Street site. The structure of Building J is situated over a series of tunnels in the north-west corner of the Calthorpe Street site, and a transfer beam is required to span over these tunnels. The piles associated with this transfer structure may need to be positioned just outside the boundary.

Phoenix Place Site

6.37. Piled foundations are proposed for the substructure, which would be conventional large diameter bored piles. The presence of the Fleet Sewer beneath the road, Phoenix Place, and its proximity to Block C means that the foundations would need to be cantilevered on one side to keep the piles at the appropriate set back from the sewer or need to be sleeved.

6.38. The toe of each pile would founded in the London Clay therefore constitutes a low permeability barrier, preventing the creation of any potential pollution pathway to the Principal Aquifer beneath. It is anticipated that the piles would be limited in depth to approximately 32m long. Pile design and installation methodology would be the responsibility of the appointed Contractor.

6.39. All buildings of the Phoenix Place Development would be based on a concrete substructure. The basement would be surrounded by a combination of a contiguous piled wall and a reinforced concrete wall on a basement slab, founded on a series of pile caps and piles. The basement would include floor slabs made of reinforced concrete and supported by a number of concrete columns

Superstructure

Calthorpe Street Site

6.40. The superstructure for the buildings would comprise reinforced concrete frames, primarily flat slabs. Building E would be sited partially above the existing Maintenance Depot and transfer beams would be required to span across the twin depot tunnels as part of the superstructure. Other superstructure transfers would be required in the form of transfer beams, where they span over the Mail Rail tunnel.

6.41. Construction would generally proceed south to north across the Calthorpe Street site. Works to the buildings would not start until completion of the Enabling Works comprising the new access road widening at the existing delivery yard at the rear of the sorting office building, new ramp access, and the new loading bay and basement car park deck within the existing undercoft. This would allow for a full decant of the Royal Mail vehicle parking with the existing undercroft vehicle parking zone.

6.42. Construction and phasing of the superstructure works would be in line with the sequence outlined in Table 6.2.

Phoenix Place Site

6.43. The superstructure for the buildings would comprise reinforced concrete frames, primarily flat slabs. Transfer beams would be required for Block A in various positions and levels to ensure columns do not foul ramp access and car parking bays and aisles.

Fitout

Calthorpe Street Site

6.44. It is envisaged that the residential and office elements of the Calthorpe Street Development would be fitted out completely, The office building would be finished to shell and core completion, lobby / stairwells and management services, whilst the residential elements would be finished, excluding loose fixtures and fittings.

6.45. The retail / community units would be fitted out to a shell and core only, allowing retail / community tenants to complete their own fitout works.

Phoenix Place Site

6.46. It is envisaged that the residential elements of the Phoenix Place Development would be fitted out completely, excluding loose fixtures and fittings.

6.47. In common with the Calthorpe Street Development, the retail / community units on the Phoenix Place Development would be fitted out to a shell and core only, allowing tenants to complete their own fitout works.

Landscaping and External Works

Calthorpe Street and Phoenix Place sites

6.48. Landscaping would be undertaken in accordance with the Landscaping Strategy and would be phased during construction.

Plant and Equipment

6.49. The likely plant and equipment associated with each key element of the construction process is set out in Table 6.3; these would apply to all three Development Scenarios.

Table 6.3: Indicative Plant and Equipment

Plant and Equipment	Enabling Works	Demolition	Excavation	Substructure Construction	Superstructure Construction	Fitout	Landscaping and External Works
Tower cranes	✓	✓		✓	✓		
Passenger / goods hoists.					✓	✓	
Excavators and breakers.	✓	✓	✓				
Cutters, drills and small tools.	✓	✓	✓	✓	✓	✓	✓
Crushers.		✓	✓				
Floodlights.		✓	✓	✓	✓		
Fork lift truck.				✓	✓	✓	✓
Hydraulic benders and cutters.			✓	✓	✓	✓	
Lorries and vans.	✓	✓	✓	✓	✓	✓	✓
Mobile cranes.	✓	✓		✓	✓		
Mobile lorry mounted concrete pump.	✓			✓	✓		
Poker vibrator.	✓			✓	✓		
Ready mixed concrete lorry.	✓			✓	✓		
Concrete splitters / concrete saws		✓	✓	✓	✓		
Scaffolding and hydraulic access platforms.	✓	✓	✓	✓	✓	✓	✓
Tipper lorries	✓	✓	✓	✓	✓		✓
Flatbed articulated vehicle.	✓			✓	✓	✓	✓
Large rigid lorries.				✓	✓	✓	✓
Track mounted piling rigs.				✓			
Water pumps.	✓	✓	✓	✓			
Mortar batching plant.				✓	✓		✓
Temporary earthwork support.	✓		✓				

Hours of Work

6.51. The hours of work are likely to be specified within planning conditions attached to a planning permission. However, it is likely that the standard hours of work would be prescribed according to LBC and LBI's 'Guide for Contractors Working In Camden' and 'Code of Practice for Construction Sites', as set out below:

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

6.52. Although night-time (23:00 to 08:00), out-of-hours or weekend working would not normally be permitted, it is conceivable that certain works (for example, highway works) may have to be undertaken during these periods. If necessary, the hours of operation for such works would be subject to prior agreement and reasonable notice with LBC and LBI, except in any emergencies.

6.53. In addition to the above, the requirement to maintain 24 hour operational use of the adjacent Sorting Office certain works would need to be undertaken outside the standard working hours specified above.

Potential Environmental Effects

6.54. Construction sites have the potential to cause temporary disturbance and nuisance to neighbouring occupants, highway users and other sensitive receptors. Detailed assessments of likely significant environmental effects resulting from the demolition and construction works of the three Development Scenarios are described within the technical chapters of this ES (i.e. Chapters 7 to Chapter 16 inclusive) and Volume 3: *Townscape, Visual and Built Heritage Assessment*. However, a summary of potential environmental effects arising from the demolition and construction works (in the absence of mitigation) for all the Development Scenarios is given in Table 6.3.

Table 6.3: Summary of Likely Significant Effects

Topic	Potential Effects
Chapter 7: *Waste Management*	Waste generated from demolition of buildings, excavation and surplus construction material.
Chapter 9: *Transportation and Access*	Temporary disturbance to highway users, including pedestrians and cyclists. Increase in Heavy Good Vehicles (HGV) using the local road network.
Chapter 10: *Noise and Vibration*	Temporary increased noise levels from plant used during demolition, Enabling Works, piling and general construction works. Temporary increased noise levels from construction vehicles accessing and leaving the Site. Temporary increased vibration levels from plant during demolition, Enabling Works, piling and general construction works.
Chapter 11: *Air Quality*	Windblown dust generated from exposed ground surfaces, stockpiles, earth moving vehicles, and cutting and grinding of materials causing nuisance. Exhaust emissions from construction vehicles delivering and removing materials and construction plant.
Chapter 12: *Archaeology*	Loss / truncation of any buried heritage assets, including palaoenvironmental deposits.
Chapter 13: *Ground Conditions and Contamination*	Demolition and construction workers exposed to ground contamination. Disturbance to any underlying buried unexploded ordnance. Release and mobilisation of any contamination to controlled waters (underlying aquifers).
Chapter 15: *Wind*	Temporary changes in the local wind microclimate.
Chapter 16: *Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare*	Temporary changes to the duration and quality of daylight, sunlight and overshadowing to surrounding residential properties.
Volume 3: *Townscape, Visual and Built Heritage Assessment*	Temporary visual intrusion of views and temporary change in the townscape character as a result of the presence of tower cranes. Temporary changes to the setting of Conservation Areas and listed buildings.

Construction Environmental Management Plans

6.55. The nature, extent and magnitude of any adverse effects associated with the demolition, Enabling Works and construction works are largely dependent on the implementation of effective management controls e.g. employment of dust suppression methods and the use of properly maintained plant.

6.57. The principal Contractor would be required to prepare and implement site-specific CEMP for the Phoenix Place site and the Calthorpe Street site in accordance with LBC's in *Guide for Contractors Working in Camden* and LBI's *Code of Practice for Construction Sites.* Implementing a CEMP is an established method for managing potentially adverse environmental effects resulting from demolition and construction works, and is consistent with methods generally adopted for major schemes in urban locations throughout the UK. The CEMP's would be an operational manual for carrying out environmental controls and monitoring during the demolition and construction works. The content of the CEMP's would be discussed and agreed with LBI and LBC as appropriate prior to the commencement of the demolition, Enabling Works and construction works and could be secured through a planning condition.

6.58. Should any of the Development Scenarios proceed, the CEMP's would include:

- Available details of the phasing of the works;
- Details of the demolition, Enabling Works (for Development Scenario 1 and 2) and construction activities to be undertaken highlighting any operations likely to result in adverse environmental effects, with an indication of the specific detailed mitigation measures to be employed;
- Prohibited or restricted operations;
- A framework for compliance with relevant legislation and guidance;
- Details of plant to be used;
- Details of proposed routes for HGVs travelling to and from the Site;
- Roles and responsibilities of key staff including training of staff, liaison with stakeholders, and management of enquiries and complaints;
- Details of emergency procedures which would be implemented on the Site;
- Details of general Site management practices, including working hours, hoarding, access, lighting, Site facilities, energy and water use, waste, materials procurement and storage;
- Baseline levels for noise, vibration and dust, and monitoring protocols;
- Setting of 'Threshold' and 'Action Levels' for noise, vibration and dust to warn of activities which may require particular care and control;
- Details of environmental management and control procedures, covering traffic and access, noise and vibration, dust, contamination, hazardous materials and waste management, drainage and pollution control;
- Details of all works involving interference with a public highway, including temporary road / footpath closures, realignment and diversions, and temporary car parks;
- Requirements for auditing, monitoring and record-keeping;
- Mechanisms for third parties to register complaints and the procedures for responding to complaints; and
- Provisions for reporting, public liaison and prior notification, especially where dispensations would be required.

6.59. The preparation and implementation of the CEMP's would place stringent contractual and procedural performance obligations upon trade Contractors. In addition to the CEMP's, the principal Contractor would be required to register with the Considerate Constructors Scheme to ensure high safety and working standards on the Site.

Management of Construction Works and Liaison Personnel

6.60. There would be a designated Liaison Officer who would deal with public and other complaints and enquiries. This nominated individual would be named at the Site entrances, with a contact number, and would be identified to LBI and LBC as appropriate and community groups prior to the start of Site activities, and whenever a change of responsibility occurs.

6.61. Measures for community liaison would be dealt with by the Liaison Officer. The following communication methods would also be used:

- Newsletters and regular updates particularly for neighbouring businesses and residents;
- Phone helpline, meetings / presentations and Site tours;
- Notice boards / hoarding information; and
- Personal contact particularly prior to abnormal work.

6.62. In the event of any unusual activities or events that can be anticipated, these would be notified to LBI and LBC as appropriate and to the relevant property owners or occupiers, and neighbours, wherever possible, in advance of the activity.

Management of Sub-Contractors

6.63. Where individual contracts are implemented (for example for demolition and waste removal) these would incorporate relevant environmental control requirements, based largely on the standard of 'good working practice' as outlined in the CEMP's, as well as statutory requirements. Potential trade Contractors could be required to demonstrate how they would achieve the provisions of the CEMP's, how targets would be met and how likely effects would be minimised.

Public Safety, Emergencies and Accidents

6.64. The principal Contractor carrying out the works would be required to liaise fully with LBI and LBC as appropriate, the Metropolitan Police and other relevant parties with regard to maintaining and contributing to a safe environment around the Site.

6.65. A clear and secure demarcation between operational activities and other areas would be maintained through the use of hoardings to ensure public safety. Particular attention would be given to crossing points on surrounding roads, demolition and construction routes, access gates and security arrangements. A 'clean site' policy would be maintained at all times.

6.66. The principal Contractor would be required to maintain high safety standards on the Site, and to be fully compliant with current health and safety legislation.

6.67. The principal Contractor would have a Logistics Manager who would be responsible for all construction traffic movements, off-loading, waste removal and road cleaning operations and consultation with LBI and LBC with regard to abnormal loads and lane closures

6.68. An Emergency Incident Plan would be in place to deal with any spillages and / or pollution incidents. Any pollution incidents would be reported immediately to the regulatory bodies.

Environmental Monitoring

6.69. Prior to the demolition, Enabling Works and construction work commencing on the Site, baseline dust and noise monitoring would require updating to complement the existing data prepared for the purpose of the EIA and presented in this ES. The baseline monitoring would be used to confirm 'Threshold' and 'Action Levels' for noise and dust. The Action Levels would be agreed with LBI and LBC as appropriate prior to the commencement of work.

6.70. Where the 'Threshold' levels are exceeded, the working activities taking place on the Site at the time, together with the mitigation measures, would be reviewed. If the Action Levels are reached, the causative activity would be temporarily halted until further mitigation is implemented.

6.71. Throughout the demolition, Enabling Works and construction works, an Environmental Manager would undertake audits at the Site to ensure that the sub-contractors are complying with the relevant legislation and contractual requirements. The Environmental Manager would liaise with LBI and LBC as appropriate and the Liaison Officer to improve working procedures, where necessary.

Access and Traffic Management

6.72. Predicted traffic flow alterations and implications (if any) for construction vehicles, and construction access locations for the duration of the demolition and construction works are summarised below and illustrated on Figures 6.3 to 6.5. The sequences described below have been co-ordinated with the programme of all three Development Scenarios previously described in this Chapter. Final details regarding traffic flow alteration and management would be agreed with LBC and LBI, and Transport for London (TfL) prior to the commencement of any works.

6.73. It is anticipated that peak construction traffic flows for all three Development Scenarios would occur during Quarter 3 2015 to Quarter 4 2016. This would relate to the main substructure works on Phase 1 of the Phoenix Place Development, overlapping with substructure and superstructure works on the Calthorpe Street site. Construction deliveries would be dominated by demolition, muck-away and ready mixed concrete wagons, as well as large HGVs delivering reinforcing steel.

6.74. Construction deliveries within the programme for all three Development Scenarios would peak as follows:

- Development Scenario 01 – 23 vehicles per hour (two-way traffic) in Quarter 1 2016;
- Development Scenario 02 – 19 vehicles per hour (two-way traffic) in Quarter 4 2016; and
- Development Scenario 03 – 12 vehicles per hour (two-way traffic) in Quarter 3 2015.

6.75. There would be a number of access points at various locations, during the various phases of construction, and it is intended that during the majority of the works, a one way system would be implemented. During the construction of the Phoenix Place Development, access to Phase 1 and 2 works, would be provided primarily off Cathorpe Street and Phoenix Place. During the Enabling Works and for most of the Calthorpe Street construction works, access would be primarily off Farringdon Road. Construction access and exits would be facilitated through a series of re-alignments to the existing Sorting Office entrance to suit each construction phase, and controlled crossing measures within the internal road network. Wheel wash facilities would be provided at all exit points.

6.76. The construction vehicle routes, which would be agreed with LBI and LBC, would be restricted to the strategic highway network, including the local network. All traffic entering and leaving the construction site for all three Development Scenarios would be closely controlled. Vehicles making deliveries or removing spoil or demolition material would travel via designated routes which would be agreed with LBI and LBC, and other relevant bodies such as TfL.

6.77. Detailed information on these issues and measures to minimise the risk of traffic congestion would be presented in detail through a Construction Traffic Management Plan that would be compiled by the contractor and agreed with LBI and LBC, prior to commencement of any works. Measures would likely to include:

- Deliveries would be phased and controlled on a 'just in time' basis with all vehicles being clearly marked to show their destination and entry gate number;
- In the event of any unusual activities or events that can be anticipated, LBI and LBC, and other relevant adjacent property owners or occupiers would be notified, in advance of the activity, wherever possible;
- Deliveries would be managed on the Site to ensure the 24 hour operation of the Mount Pleasant Sorting Office; and
- All deliveries to the Site would be carried out within normal working hours and would avoid peak travel times, where possible. Provision would be made to ensure that vehicles are unloaded on the Site, rather than on the adjacent roads, wherever possible.

Noise and Vibration

6.78. To minimise likely noise and vibration effects during the demolition, Enabling Works and construction works associated with the Development Scenarios, Site-specific best practice measures would be implemented and adhered to by contractors. Such measures would be set out in the CEMP's and suitable plant and working methods would be agreed with LBI and LBC as appropriate prior to commencement of works. Noise and / or vibration would also be monitored across the entire Site, where necessary, which would assist in controlling levels at specific receptors. Routine works would be limited to the specified hours outlined above and would be subject to agreement with LBI and LBC as appropriate. Control measures aimed at minimising noise and vibration would include:

- Using best practicable means including modern, quiet and well maintained machinery such as electric powered plant;
- Using non-vibratory or percussive piling techniques, where possible, to minimise noise and vibration;
- Using enclosures and screens (hoardings and heavy sheeting) around noisy fixed plant, especially near to noise sensitive receptors;
- Liaising with the occupants of adjacent commercial and residential properties most likely to be affected by any noise or vibration from activities on the Site. The occupants would be informed of the nature of the works, proposed hours of work and anticipated duration prior to the commencement of activities;
- Adhering to relevant British Standards to establish noise and vibration 'Threshold' and 'Action' levels; and
- Reviewing demolition and construction techniques, especially in response to exceedences of the Action Level and / or complaints.

6.79. Further details of the likely significant noise and vibration effects arising from the demolition and construction works for each Development Scenario, together with the details of mitigation measures are presented in Chapter 10: *Noise and Vibration* of this ES.

Dust and Air Quality,

6.80. To minimise the release of dust and air pollution during demolition and construction works, a number of measures would be implemented. These would be detailed in the CEMP's and would include:

- Routine dust monitoring at sensitive residential locations, particularly those close to the construction Site boundary, with the results and effectiveness of controls reviewed at regular meetings;
- Damping down surfaces during dry weather;
- Providing appropriate hoarding and / or fencing to reduce dust dispersion and restrict public access;
- Sheeting buildings, chutes, skips and vehicles removing wastes with the potential for dust generation;
- Appropriate handling and storage of materials, especially stockpiled materials;
- Restricting drop heights onto lorries and other equipment;
- Using the most modern and least polluting mechanical and electrical plant incorporating diesel exhaust particulate filters and oxidation catalysts wherever possible;
- Fitting all equipment with dust control measures such as water sprays, wherever possible;
- Using a wheel wash, limiting speeds on Site to 5 miles per hour, avoiding of unnecessary idling of engines and routing of Site vehicles as far from sensitive properties as possible;
- Using gas powered generators rather than diesel if possible (these are also quieter) and ensuring that all plant and vehicles are well maintained so that exhaust emissions do not breach statutory emission limits;
- Switching off all plant when not in use;
- Prohibiting fires on the Site; and
- Ensuring that a road sweeper is available to clean mud and other debris from hard-standing, roads and footpaths.

6.81. Further details of the likely air quality effects arising from the demolition and construction works for each Development Scenario, together with the details of mitigation measures, are presented in Chapter 11: *Air Quality* of this ES.

Waste Minimisation and Management

6.82. At this stage, it is not possible to accurately quantify the amount of materials arising from the demolition and excavation works for each Development Scenario. It is envisaged that the demolition works on the Phoenix Place site would comprise removal of the existing structures on site and breakup of the existing hardstanding and perimeter walls, resulting in approximately 978m3 of demolition material. On the Calthorpe Street site, demolition works would comprise removal of redundant external buildings such as the gate pavilion, ramps and Loading Canopy. It is estimated that approximately 3,014m^3 of demolition material would arise on the Calthorpe Street site.

6.83. As a result of the anticipated excavation works (including piling) it is estimated that approximately 48,496 m^3 of excavation material would be produced from the Phoenix Place site and 55,304m^3 of excavation material would be produced from the Calthorpe Street site.

6.84. A Site Waste Management Plan (SWMP) would be developed and implemented during the demolition and construction works. This would be prepared by the principal Contractor in accordance with the Site Waste Management Plan Regulations 2008[3] and non-statutory guidance on preparation of SWMPs. All relevant contractors would be required to investigate opportunities to minimise waste arisings at source and, where such waste generation is unavoidable, to maximise the recycling and reuse potential of demolition and construction materials. Recycling of materials would take place off-Site, where noise and dust would be less likely to significantly affect the occupants of surrounding properties. Appropriate waste management and recycling centres close to the Site would be identified prior to the demolition works and contracts would be established with registered waste carriers and authorised waste disposers for the demolition waste.

6.85. All waste would be stored on the Site in accordance with the relevant legislation; in particular the Duty of Care Regulations, 1991 (as amended)[4] and no burning of demolition and construction waste would be permitted at the Site.

6.86. The destination of all waste or other materials removed during demolition and construction would be notified to the relevant authority by the principal Contractor for approval. Waste material would only be deposited at authorised waste treatment and disposal sites. Deposition of waste would be in accordance with the requirements of the Environmental Protection Act 1990[5], the Controlled Waste Regulations 1992 (as amended)[6], the Hazardous Waste Regulations 2005[7], the List of Waste Regulations 2005[8] and the Duty of Care Regulations 1991[4].

6.87. Further details of waste generation and the management of waste are provided in Chapter 7: *Waste Management*.

Materials Storage and Handling

6.88. Environmental issues would be considered in the procurement of raw materials and all such materials would be appropriately stored in order to minimise damage by vehicles, vandals, weather or theft. Contractors and their sub-contractors would be required to maintain a tidy site and where practical, to operate a 'just-in-time' policy for the delivery and supply of materials for the works.

6.89. Any stockpiled material on the Site would be located on hard-standing and covered in sheeting. Potentially hazardous materials stored in tanks on the Site would also be stored on hard-standing and bunded in accordance with Environment Agency requirements.

Hazardous Materials and Contaminated Land

6.90. Owing to the historical land uses, ground contamination is likely to exist on the Site, particularly in the Phoenix Place site (see Chapter 13: *Ground Conditions and Contamination* of this ES). An SI would be required to fully determine the nature and the extent of any ground contamination within the underlying soils and aquifers. Should any remediation be required, a Remediation Strategy would be developed and implemented in agreement with the Environment Agency, LBI and LBC as appropriate.

6.91. Prior to the demolition and construction works for either the Calthorpe Street site or the Phoenix Place site, the principal Contractor would be required to prepare a Method Statement and Risk Assessment for the part of the Site where the demolition and construction works are being undertaken demonstrating how the safety of construction workers and the public would be addressed in terms of potentially harmful substances. Buildings and structures, which have the potential to contain asbestos containing material, would be surveyed prior to demolition and any identified asbestos would be removed by a licensed contractor in accordance with the relevant legislation and regulations. Protective measures would include:

- Providing adequate facilities and procedures for personal washing and changing;
- Providing and using personal protective equipment and respiratory protective equipment;
- Implementing dust suppression methods;
- Using bunded areas (secure and impervious areas) for diesel fuel or chemicals;
- undertaking regular site inspection for spillages; and
- Sampling and testing excavated material to determine its waste classification under the Landfill (England and Wales) (Amendment) Regulations 2005[9] and disposal at a suitably licensed facility.

Site Drainage, Water Quality and Flood Risk

6.92. The principal Contractor would hold plans on the Site showing the location of all surface and foul water drains and would make other contractors aware of the drainage network. Surface drainage during demolition and construction would pass via settlement and oil interception facilities, where required. Discharge arrangements would be agreed with the Environment Agency and Thames Water.

6.93. The principal Contractor would ensure that all potentially contaminated water, such as dewatering effluent, is disposed of in accordance with the Water Resources Act 1991 (as amended)[10] and Water Act 2003[11], to the satisfaction of the Environment Agency and Thames Water.

6.94. The CEMP's would outline measures to control surface water runoff thereby reducing the risk of excavations flooding, together with measures the following measures to protect controlled waters:

- Using appropriately tanked and bunded storage areas for fuels, oils and other chemicals;
- Implementing measures to collect and disposal of Site runoff to avoid surface water ponding;
- refuelling vehicles in designated surfaced locations;
- Using drip trays when filling smaller containers from tanks or drums to avoid drips and spills; and
- Sampling and testing dewatered groundwater prior to release to combined surface water / foul water sewers, where appropriate, in accordance with environmental legislation, and in agreement with the Environment Agency, LBI and LBC, where appropriate.

6.95. The assessment of likely significant effects of the Development Scenarios on flooding is presented in Chapter 14: *Water Resources and Flood Risk* and the likely significant effects on the quality of controlled waters is considered in Chapter in Chapter 13: *Ground Conditions and Contamination* of this ES.

Protection of Archaeological Resources

6.96. The assessment of the likely effects of the demolition and construction works associated with each Development Scenario on buried heritage is presented in Chapter 12: *Archaeology*.

6.97. A programme of palaeoenvironmental and geoarchaeological investigation would be undertaken in advance of demolition and construction works (including Enabling Works on the Calthorpe Street Development), which would be agreed with LBI and LBC as appropriate. Archaeological monitoring and recording during the groundworks would also be undertaken to record any other buried heritage assets that may have survived truncation.

Protection of Listed Buildings and the Setting of Conservation Areas

6.98. To minimise the temporary changes to the setting of the Conservation Areas, within one of which the Calthorpe Street site is located, and listed buildings surrounding the Calthorpe Street site and Phoenix Place site, hoarding would be used, which would be sensitive to the surrounding area. Construction plant and techniques would be carefully selected to minimise vibration and thus the potential structural damage to listed buildings.

Ecological Management and Protection of Trees

6.99. The scattered trees and vegetation on the Site provide limited opportunities for common bird species during the breeding bird season. However, should tree / building works, and in particular, demolition take place during the bird breeding season (generally taken to be March to August inclusive) an ecologist would need to confirm that no active nests would be affected prior to such works commencing.

6.100. The CEMP's would include measures to minimise potential disturbance to flora and fauna, particularly in relation to protected species, including controlling lighting. This would ensure all lighting is appropriately aimed and switched off when the Site is not operational (where practicable) to minimise any effects on adjacent areas.

References

1 London Borough of Camden (February 2008) *Guide for Contractors Working In Camden*, London Borough of Camden.

2 London Borough of Islington (no date) *Code of Practice for Construction Sites*, London Borough of Islington.

3 Department of Trade and Industry (DTI) (2008) *Site Waste Management Plan - Guidance for Construction Contractors and Clients: Voluntary Code of Practice*. DTI, London.

4 Office of the Deputy Prime Minister (ODPM) (1991) *The Environmental Protection (Duty of Care) Regulations* SI 1991 No. 2839. HMSO, Norwich.

5 HMSO (1990) *Environmental Protection Act 1990*.

6 HMSO (1992) *The Controlled Waste Regulations 1992* (as amended).

7 Office of the Deputy Prime Minister (2005) *The Hazardous Waste (England and Wales) Regulations*, SI 2005 No.894. HMSO, Norwich.

8 Office of the Deputy Prime Minister (ODPM) (2005) *The List of Waste (England) Regulations, 2005*. SI 2005 No. 895. HMSO, Norwich.

9 Department for Environment, Food and Rural Affairs (2005) *The Landfill (England and Wales) (Amendment) Regulations 2005*, HMSO, London.

10 HMSO (2009) *The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009*. No.3104.

11 HMSO (2003) *Water Act 2003*.

7. Waste Management

Introduction

7.1. This Chapter, which was prepared by Waterman Energy, Environment & Design Ltd (Waterman EED), presents an assessment of the likely nature and quantities of demolition and construction waste arising from each of the three Development Scenarios and the requirements for treatment. The generation and management of Municipal Solid Waste (MSW) and commercial waste are also considered in the context of national, regional and local waste policies.

7.2. The Chapter also provides a summary of relevant planning policy and a description of the methods used in the assessment. This is followed by a description of the assumed future baseline conditions, and an assessment of the potentially significant effects of the Development Scenarios. Mitigation measures are identified, where appropriate to avoid, reduce or offset any adverse effects identified, and the nature and significance of the likely residual effects are assessed.

7.3. This Chapter was informed by the Operational Waste Plans for the Calthorpe Street Development and Phoenix Place Development, prepared by SKM Enviros, which are submitted separately with the planning applications.

Legislation, Planning Policy and Guidance

European Legislation

The Waste Framework Directive, 2008

7.4. The Waste Framework Directive (2008/98/EC)[1] replaces the Waste Framework Directive (2006/12/EC), the Hazardous Waste Directive (91/689/EC) and the Waste Oil Directive (75/439/EEC) (as amended). The Directive consolidates and updates the framework of European Union (EU) law on all aspects of waste, and merges the hazardous and non-hazardous regimes into a single Directive. The Directive sets out more stringent waste reduction and management targets, together with a waste hierarchy ('priority order') for the reduction of waste: waste prevention, re-use, recycling, recovery including energy recovery, and disposal. The Directive has been transposed into England and Wales legislation by the Waste (England and Wales) Regulations 2011[2].

The Landfill Directive, 1999

7.5. The Landfill Directive 99/31/EC[3] aims to harmonise the standard and use of landfill sites across Europe. It is implemented via the Landfill (England and Wales) Regulations 2002[4] and sets stringent requirements with regards to landfilling practices, including the end of co-disposal of hazardous and non-hazardous waste, targets for landfill reduction and a new system of landfill classification. Consequently, any soil excavated from the Sites would require Waste Acceptance Criteria (WAC) testing, followed by appropriate treatment and disposal.

National Legislation

The Waste (England and Wales) Regulations, 2011

7.6. The Waste (England and Wales) Regulations[5] transpose the Waste Framework Directive, 2008 into national law and came into force from 29 March 2011. This Regulation require waste producers or those handling waste to comply with the Waste Framework Directive waste hierarchy unless it can be justified on environmental or technical grounds that this is not appropriate.

7.7. From 1 Jan 2014, any business that carries their own waste would need to be registered as a waste carrier. However, once registered, they would not need to register again unlike other waste carriers, who would still need to register every three years.

7.8. From 1 Jan 2015, any business collecting waste containing waste paper, glass, metal or plastic must "*take all such measures to ensure separate collection of that waste*", to promote recycling.

7.9. Transfer notes would require additional information including the 2007 Standard Industry Classification (SIC). SIC is a method of grouping businesses by the type of economic activity they are involved in. Transfer notes require the SIC code of the transferor and confirmation that they have applied the WFD waste hierarchy.

Site Waste Management Plans Regulations, 2008

7.10. The Site Waste Management Plan (SWMP) Regulations[6] came into force on 6 April 2008. The SWMP Regulations require all development, where construction works are valued over £300,000, to have a SWMP prepared and implemented.

7.11. SWMPs provide a structure for systematic waste management from the early stages of design to the completion of construction. SWMPs must describe the types of waste expected to be produced during demolition and construction, and the actions proposed for the disposal of such waste, including reuse and recycling. Estimated quantities and waste management actions must be identified for each waste type likely to be produced. SWMPs must also contain declarations from the Applicant and Principal Contractor that they would take all reasonable steps to ensure that:

- All waste from a site is dealt with in accordance with the Duty of Care Regulations, 2003;
- Materials would be handled efficiently; and
- Waste would be managed appropriately.

Environmental Protection (Duty of Care) (England) (Amendment) Regulations, 2003

7.12. The Environmental Protection (Duty of Care) Regulations[7] implemented under the Environmental Protection Act 1990, apply to all businesses that produce, import, carry, keep, treat or dispose of controlled waste from business or industry or act as a waste broker in this respect. Under these Regulations, all businesses are responsible for the safe and proper disposal of waste, even once it has been passed to a third party. This Duty of Care extends until the waste has either been satisfactorily disposed of, or fully recovered.

7.13. The Duty of Care Regulations stipulate that:

- All waste is stored and disposed of responsibly;
- Waste is only handled or dealt with by individuals or businesses that; are authorised to deal with it, who have a waste management licence, are a registered carrier of controlled waste, a waste collection authority or be exempt; and
- A record is kept of all waste received or transferred through the use of Waste Transfer Notes (WTN).

National Planning Policy

National Planning Policy Framework, 2012

7.14. The National Planning Policy Framework[8] (NPPF) does not contain any specific waste policies. A separate national waste planning policy will be published alongside a National Waste Management Plan (NWMP) for England in due course. The NPPF states that Planning Policy Statement 10: 'Sustainable Waste Management' (PPS10)[9] will remain valid until the adoption of the NWMP, which is expected to be published towards the end of 2013.

Planning Policy Statement 10: Planning for Sustainable Waste Management, 2011

7.15. PPS10, which was adopted in July 2005 and amended in March 2011 and remains in place notwithstanding the NPPF encourages sustainable waste management through considering waste as a resource, driving waste management up the waste hierarchy and considering disposal as a last resort. PPS10 aims to break the link between economic growth and the effects of waste production. It assists in implementing the national waste strategy and supports the targets for recycling and recovery.

7.16. PPS10 recommends that new developments should be supported by SWMPs. It also promotes good design and layout in new developments to secure opportunities for sustainable waste management without creating adverse effects upon the street scene.

The Waste Strategy for England, 2007

7.17. The Waste Strategy for England, 2007[10], sets out a strategy for waste, continuing to follow the waste hierarchy, which prioritises waste management from the most favourable option of 'reduction', through 're-use', 'recycling and composting', 'energy recovery', to the least favourable option of 'disposal'. The Waste Strategy sets out the following objectives:

- Reduce the link between economic growth and waste growth and put more emphasis on waste prevention and re-use;
- Meet and exceed the Landfill Directive diversion targets for biodegradable municipal waste;
- Increase diversion of non-municipal waste from landfill;
- Invest in infrastructure required to divert waste from landfill and for the management of hazardous waste; and
- Maximise the environmental benefit from that investment, through increased recycling of resources and recovery of energy from residual waste. Recovering energy from waste (EfW) which cannot sensibly be recycled is an essential component of a well-balanced energy policy.

7.18. The Waste Strategy also sets out a number of targets including:

- Recycle or compost at least 45% by 2015 and 50% by 2020; and
- Recover 67% of municipal waste by 2015 and 75% by 2020.

Regional Planning Policy

The London Plan: Spatial Development Strategy of Greater London, 2011

7.19. Policy 5.16 'Waste Self-Sufficiency' of the London Plan[11] seeks to manage as much of London's waste within London as practicable, working towards managing the equivalent of 100% of London's waste in London by 2031, sending no biodegradable waste to landfill by 2031 and creating positive environmental and economic effects from waste processing. This would be achieved by:

- Minimising waste through encouraging the reuse of and reduction in the use of materials;
- Recycling / composting at least of 45% of MSW by 2015, 50% by 2020 and aspiring to achieve 60% by 2031;
- Recycling / composting levels at least 70% of commercial and industrial waste by 2020;
- Recycling or reusing at least 95% of Construction Demolition and Excavation (CD&E) waste by 2020;
- Reducing the proportion of waste exported from the capital over time; and
- Working with neighbouring regional and district authorities to co-ordinate strategic waste management across the greater south-east of England.

7.20. Policy 5.17 'Waste Capacity' stipulates that suitable waste and recycling storage facilities are required in all new developments, whilst Policy 5.18 'Construction, Excavation and Demolition Waste' suggests that major development sites are required to recycle CD&E waste on-site and planning conditions are used to achieve this.

Revised Early Minor Alterations to the London Plan, 2012

7.21. In June 2012, the London Plan Revised Early Minor Alterations[12] was published for public consultation in order to establish consistency with the NPPF. No alterations were proposed to the policies outlined above.

The Mayor's Municipal Waste Management Strategy: London's Wasted Resource, 2011

7.22. In November 2011, the Mayor of London published 'London's Wasted Resource'[13] a Municipal Waste Management Strategy. The Municipal Waste Management Strategy seeks to achieve the following targets:

- To achieve zero municipal waste direct to landfill by 2025;
- To reduce the amount of household waste produced in 2008/09 from 970kg per household to 790kg per household by 2031. This is equivalent to a 20% reduction per household;
- To increase London's capacity to reuse or repair municipal waste from approximately 6,000 tonnes a year in 2008 to 20,000 tonnes a year in 2015 and 30,000 tonnes a year in 2031;
- To recycle or compost at least 45% of municipal waste by 2015, 50% by 2020 and 60% by 2031; and
- To generate as much energy as possible from London's organic and non-recyclable waste in a way that is no more polluting in carbon terms than the energy source it replaces. This is estimated to be possible for about 40% of London's municipal waste after recycling or composting targets are achieved by 2031.

The Mayor's Business Waste Management Strategy: Making Waste Work in London, 2011

7.23. The Mayor's Business Waste Management Strategy[14] was published in November 2011. The term 'business waste' in the strategy refers primarily to commercial and industrial (C&I) waste and Construction, Demolition and Excavation Waste (CD&E) waste that is collected and managed by the private sector. The Mayor's targets in relation to business waste are:

- Achieve 70% re-use, recycling and composting of C&I waste by 2020, maintaining these levels to 2031; and
- Achieve 95% re-use, recycling and composting of CD&E waste by 2020, maintaining these levels to 2031.

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

7.24. Policy DM43 'Sustainable Design Standards' of the emerging Development Management Policies[15] for the London Borough of Islington (LBI) requires that within residential developments, a minimum 10% of the total value of material used should be derived from recycled and reused content in the products and materials selected.

London Borough of Islington's Site Allocations Submission, 2012

7.25. Waste management is not addressed in LBI's Site Allocations Submissions[16]. The planning framework for waste management will be set out in the North London Waste Plan[17] (NLWP) when it's published. Work on developing the new Plan was scheduled to begin in early 2013.

London Borough of Islington's Finsbury Local Plan Submission, 2012

7.26. Waste management is not addressed in LBI's Finsbury Local Plan[18] because the planning framework for waste management will be set out in the NLWP.

London Borough of Islington's Core Strategy, 2011

7.27. LBI's adopted Core Strategy[19] sets out a number of objectives to achieve manage waste more efficiently by dealing with more waste higher up the waste hierarchy. Policy CS11 'Waste' encourages sustainable waste management by:

- "Promoting *waste reduction, reuse, recycling, composting and resource efficiency over landfill;*
- *Requiring* developments *to provide waste and recycling facilities which fit current and future collection practices and targets and are accessible to all;*
- *Designing* sites *through the NLWP to meet an aggregated apportionment target across the boroughs that make up the NWLP; and*
- *Protecting the Hornsey Street transfer and household recycling facility against change of use in line with policies set out in the NLWPP*".

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

7.28. No waste-related policies are referenced in the LBI's Unitary Development Plan (Saved Policies)[20].

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

7.29. Waste generation is not addressed in the London Borough of Camden's (LBC) Site Allocations Proposed Submissions Document[21]. The NLWP is identified as the document within the Local Development Framework that would provide the planning framework for waste management.

London Borough of Camden's Core Strategy, 2010 to 2025, 2010

7.30. LBC's Core Strategy[22] sets out a number of strategic objectives, including managing waste more efficiently. Policy CS18 'Dealing with our waste and encouraging recycling' proposes the following targets to make Camden a low waste Borough:

- Aim to reduce the amount of waste produced in the Borough and increase recycling and the re-use of materials to meet the targets of 45% by 2015 and 50% by 2020; and
- Make sure that developments include facilities for the storage and collection of waste and recycling.

London Borough of Camden's Development Policies 2010 to 2025, 2010

7.31. There are no policies specifically relating to waste management within the LBC's adopted Development Policies document[23]. Again, this document explains that the NLWP, which also forms part of the Local Development Framework, will set out waste management policies.

Mount Pleasant Supplementary Planning Document, 2012

7.32. The adopted Mount Pleasant Supplementary Planning Document[24] (SPD) provides details on some of the key validation requirements stipulating "*the Waste Management Plan for the site should indicate:*

a) The estimated volumes and types of waste produced by the development;

b) The size and location of waste and recycling stores and how recyclable material and other waste will be delivered to these stores;

c) The equipment specified for containing the waste; and

d) The proposed collection point and the method for transferring waste to this location…"

Guidance

Commercial and Industrial Waste in England: Statement of Aims and Actions, 2009

7.33. The Statement of Aims and Actions[25] sets out aims and actions to manage C&I waste, which are to:

- Reduce the amount of waste that arises in the first place, by more sustainable design, production, purchasing and use as well as reuse of products and materials in the economy;
- Increase the proportion of the waste that does arise which is productively re-used, recycled or recovered;
- Reduce significantly the amount of waste that is sent to landfill or incinerated without recovering energy;
- Manage any remaining residual waste responsibly; and
- Maximise the investment opportunities for business from commercial and industrial waste management.

Supplementary Planning Guidance: Sustainable Design and Construction, 2006

7.34. Supplementary Planning Guidance (SPG) on Sustainable Design and Construction was published by the Greater London Authority (GLA) in May 2006[26]. The SPG provides guidance on the nature of waste facilities to be provided as part of new development and the management of waste during demolition and construction.

7.35. The SPG outlines 'Essential' and 'Preferred' Standards that apply to major developments. The Essential Standards are minimum standards based on current Building Regulations, and the targets set out in the Mayor's strategies and current good practice. The Preferred Standards include more exemplary approaches.

7.36. Relevant Essential Standards include:

- Minimise, reuse and recycle demolition waste on site where practical;
- Reduce waste during construction and demolition phases and sort waste streams on site where practical;
- Specify the use of reused or recycled construction materials; and
- Recycling facilities should be as easy to access as waste facilities.

7.37. Relevant Preferred Standards include:

- Provide facilities to recycle or compost at least 60% of household waste by 2015; and
- Provide facilities to recycle 70% of commercial and industrial waste by 2020.

London Borough of Islington's Code of Practice for Construction Sites

7.38. LBI's Code of Practice for Construction Sites[27] requires waste material to be disposed of to an appropriately licensed or licence-exempt waste management site. The Borough is keen to promote the use of surplus or waste materials in reducing the effect on the environment and the costs associated with their disposal. As such, demolition and construction waste should be re-used on site where feasible. A demolition waste audit of the development site and a construction waste management plan are also recommended as part of the Code of Practice.

Guide for Contractors Working In Camden, 2008

7.39. The Guide for Contractors Working in Camden[28] states that contractors must try to reuse and recycle materials wherever possible. Work Method Statements are recommended to cover demolition works, delivering material, disposing of waste, remaining materials and waste, and all related construction activities. All waste material that is removed must be done so within permitted hours. Waste materials must not be allowed to build up on the Site.

Assessment Methodology and Significance Criteria

Assessment Methodology

Baseline Conditions

7.40. A desk-based study was undertaken to establish the likely future baseline conditions in relation to waste generation and disposal facilities within the administrative boundaries of the GLA, LBI, LBC and at the Site.

7.41. The typical waste arisings, management practices and recycling rates within London, the administrative boundaries of LBI and LBC were established from a review of existing documentation and latest data available, such as Capital Waste Facts[29], LBI and LBC websites and Municipal Waste Statistics 2009/2010[30] published by Department of Environment Food and Rural Affairs (DEFRA). For the purposes of this assessment, it was assumed that the latest data available would be representative and therefore they form the future baseline conditions of the Site and surrounding area.

Demolition and Construction

7.42. An estimate of the amount of waste generated from the demolition and excavation works was made in consultation with the project's construction advisor, MACE and quantity surveyors, Davis Langdon. Consideration was given to the extent of demolition and excavation required, and the potential for the reuse of materials on the Site.

7.43. Waste generated during the demolition and construction phase of each of the Development Scenarios was estimated using the data on large scale construction projects published by the Building Research Establishment (BRE)[31] and issued in June 2012. For the purposes of this assessment, construction-related waste relating to the basements were based on the BRE data; as follows:

- 20.9 cubic metres (m^3) of waste would be generated in the construction of 100 square metres (m^2) of retail floorspace;
- 19.8m^3 of waste would be generated in the construction of 100m^2 of office floorspace;
- 18.1 m^3 of waste would be generated in the construction of 100m^2 of residential floorspace; and
- 18.3m^3 (average taken of BRE data) of waste would be generated in the construction of 100m^2 of basement floorspace.

7.44. For the purposes of this assessment it was assumed that 1m^3 of waste is equivalent to one tonne of waste.

Completed Development Scenarios

7.45. Waste generation from the completed Development Scenarios were estimated using data outlined in Planning for Sustainable Communities: A Code of Practice on Waste Infrastructure[32] and British Standard (BS) 5906:2005. The storage requirements were determined with reference to the BS 5906:2005 and LBC's and LBI's Guidance on Waste Storage Requirements[33]. Reference was also made to the Operation Waste Plans prepared for the Calthorpe Street Development and the Phoenix Place Development by SKM Enviros.

7.46. Waste calculations were based on the proposed floorspace (Gross Internal Areas (GIA)) of each of the three Development Scenarios. Since each Development Scenario includes the provision of flexible retail and community floorspace, for the purposes of this assessment, waste generation calculations for the proposed flexible retail / community use of each of the Development Scenarios were based on waste generation rates for Use Class A3, as set out in the Planning for Sustainable Communities: A Code of Practice on Waste Infrastructure This is because restaurants and cafes typically represent the worst-case scenario with regard to waste generation of all the various retail / community uses. Since the spilt between retail and community floorspace is unknown, it was assumed for the purposes of the waste calculations, that the proposed retail and community floorspace would be entirely Use Class A3 for the reason give above.

7.47. Following on from above, the effects of the various waste arisings from each of the three Development Scenarios were assessed against relevant policy. In particular, consideration was given to the design of each Development Scenario and how it seeks to achieve sustainable waste management. Owing to the greater quantum of floorspace proposed, compared to the baseline, there would inevitably be an increase in waste generation. Consequently, the assessment primarily considered whether the design and proposed waste management strategy would contribute to the achievement of national waste recovery targets and accord with the principles of sustainable waste management.

Significance Criteria

7.48. Table 7.1 sets out the significance criteria that were used in the assessment for each of the completed Development Scenarios. The significance criteria are based on the change in waste generation from the future baseline conditions, together with the recycling and composting targets set out by the London Plan and Waste Strategy.

Table 7.1: Significance Criteria

Change in Waste Generation	Negligible Recycling / Composting	Low Recycling / Composting	Moderate Recycling / Composting	High Recycling / composting
Negligible change in waste generation from the Site.	Negligible.	Minor beneficial.	Moderate beneficial.	Substantial beneficial.
Small (less than 25%) increase in waste generation from the Site.	Minor adverse.	Negligible.	Minor beneficial.	Moderate beneficial.
Moderate between 26% and 50%) increase in waste generation from the Site.	Moderate adverse.	Minor adverse.	Negligible.	Minor beneficial.
Large (greater than 51%) increase in waste generation from the Site.	Substantial adverse.	Moderate adverse.	Minor adverse.	Negligible.

Low recycling / composting is considered as achieving below the Waste Strategy targets for reuse, recycling or composting of 50% of municipal waste by 2020.

Moderate recycling / composting is considered as the reuse, recycling or composting of at least 55% of commercial waste and / or 50% of household waste, corresponding with the Waste Strategy target for 2020.

High recycling / composting is considered as the reuse, recycling or composting greater than 50% of household waste and over 60% of commercial waste, significantly exceeding the Waste Strategy target for 2020.

Future Baseline Conditions

Waste Generation

Greater London

7.49. The Mayor's Municipal Waste Strategy states that during the 2009/2010 financial year (the latest year for which data for the Greater London as a whole are available), Greater London produced 3.86 million tonnes of MSW, of which 1.9 million tonnes (49%) was disposed of to landfill, 0.8 tonnes (21%) incinerated with energy recovery, and 1.1 million tonnes (27%) was recycled or composted. The remaining 3% was sent for some form of pre-treatment or to unknown destinations.

7.50. Of the 3.86 million tonnes of MSW generated in 2009/2010, approximately 3,019,380 tonnes (79%) was household waste. The remaining 0.8 tonnes (21%) was non-household municipal waste primarily comprising grass cuttings, leaves, council office waste and waste from businesses.

7.51. London relies heavily on its surrounding regions for disposing its landfill waste, with approximately 80% of such waste being deposed to landfill sites outside Greater London. Recycling rates across London have shown signs of improvement over the last eight years; municipal recycling rates have increased from 8% in 2000/2001 to 27% in 2009/2010. The Mayor is aiming for this trend to continue with a municipal recycling target of 45% by 2015, 50% by 2020 and 60% by 2031.

7.52. In addition, the Mayor is aspiring to exceed recycling / composting levels in commercial and industrial waste of 70% by 2020 and recycling and reuse levels in CD&E waste of 95% by 2020.

7.53. Table 7.2 below sets out the waste composition of household waste in Greater London based on surveys undertaken in London between 1999 and 2004[34].

Table 7.2: Waste Analysis Data for Residual Household Waste in Greater London

Material	%
Paper and card	27.8
Plastic film	5.0
Dense plastic	5.5
Textiles	2.4
Other combustibles	10.3
Glass	7.5
Other non-combustibles	1.6
Organics	34.3
Ferrous metal	2.9
Nonferrous metal	0.9
Waste electrical and electronic equipment (WEEE)	0.3
Household Hazardous Waster	0.2
Fines (<10mm)	1.3
Total	**100**

North London Waste Authority Area

7.54. The North London Waste Authority (NLWA) has partnered with seven north London Local Planning Authorities (LPAs) to manage waste. The primary function of the NLWA is to collect and dispose of waste from the LPAs, which includes LBI and LBC. DEFRA household waste statistics released in November 2012[35] estimate that household waste collected in the NLWA was approximately 852,595 tonnes, of which 194,739 tonnes (23%) was landfilled, 426,879 tonnes (50%) sent to incineration (EfW), 224,091 recycled or recovered (26%) and 6,886 tonnes (1%) sent for other treatment. The DEFRA report further states that the total volume of household waste (852,595 tonnes) equates to 389kg per person per year.

7.55. The London Borough Environmental Fact Sheets for LBI[36] and LBC[37] state that collected household waste per person in LBI and LBC in 2009/2010 amounted to 346kg and 302kg, respectively.

7.56. C&I waste generated within the LBC and LBI in 2009 amounted to 251,726 tonnes and 161,176 tonnes respectively[38].

7.57. Recycling remained the most popular method of waste treatment, with LBC recycling approximately 47% and LBC recycling approximately 46%.

Calthorpe Street Site

7.58. The Calthorpe Street site is (and would remain following completion of the modernisation works of the Mount Pleasant Sorting Office) a delivery and servicing yard associated with the adjacent Mount Pleasant Sorting Office where loading and unloading operations takes place. Therefore, waste generation on the Calthorpe Street site is considered to be minimal and thus assumed to be zero for the purposes of this assessment.

Phoenix Place Site

7.59. The Phoenix Place site is primarily used as a car park for the staff of the adjacent Mount Pleasant Sorting Office (and would remain so following completion of the modernisation works of the Mount Pleasant Sorting Office). Therefore waste generation is assumed to be minimal and thus assumed to be zero for the purposes of this assessment.

Waste and Recycling Collection

Residential Waste Collection

7.60. A weekly kerbside collection for general waste, recyclable and compostable waste (including plastics, mixed glass, aluminium tins and cans) is provided to all residents within LBC. General waste bins are not provided by the LBC, however recyclable waste is collected in bins or bags provided by the Council. General waste bins purchased by residents are not permitted to exceed 1.07m in height. LBC also collects bulky items (domestic furniture) that are in a condition suitable for reuse at no cost to residents in partnership with the ReStore Community Project.

7.61. LBI provides a weekly general and mixed recyclable waste (including household plastic packaging, metals tins and cans, glass, paper and cardboard) collection for residents in the Borough and has also started a green garden waste collection service, which is to all street-side properties. Green garden waste collected includes grass cuttings, clippings, leaves, garden weeds, plants and pruning's and hedge trimmings. LBI also offer free bulky waste collection service for residents, where up to five items can be collected three times per year by appointment. Alternatively, bulky items can be taken to any of the Household Waste Recycling Centres (HWRC's) operated by the NLWA.

Commercial Waste Collection

7.62. LBC and LBI provide a general and recyclable waste collection service to commercial properties for a fee.

7.63. According to LBI, businesses have to pay for waste collection, either to the Council or an authorised private contractor. Businesses have a duty of care to provide a valid waste transfer note from a waste carrier licensed by the Environment Agency.

7.64. In the case of LBC, commercial waste collection requests can be made online or via the Environment Services Department. On the basis of an assessment by the Council, the cost of the collection will be advised. The charges for special collections from commercial properties at ground floor level area as follows: 1 to 5 items (or up to 30 black bags) at a cost of £50; 6 to 10 items (or up to 60 black bags) at a cost of £100; and 11 to 15 items (or up to 90 black bags) at a cost of £150.

Waste Management

7.65. Waste generated within LBI and LBC is managed by NLWA at one or more of the following facilities:

- Edmonton Solid Waste Incineration Plant; an EfW incinerator located at the Edmonton EcoPark in the London Borough of Enfield;
- Fuel Preparation Plant; a road transfer station located at the Edmonton EcoPark;
- A bulky waste recycling facility, located at the Edmonton EcoPark;
- In-vessel composting plant, located at Edmonton EcoPark;
- Hendon Rail Transfer Station, located in the London Borough of Barnet; and
- Hornsey Street Road Transfer Station, located in the London Borough of Islington.

7.66. In addition, in 2012 the NLWA took responsibility for the operation of a number of HWRCs located in the LBI and LBC; the nearest of which are the Hornsey Street HWRC and the Regis Road HWRC located 2.8km north of the Site in LBI and 3.6km north-west of the Site in LBC, respectively.

Potential Effects

Demolition and Construction

Demolition and Excavation Waste

Development Scenario 1

7.67. To facilitate Development Scenario 1, the existing buildings and some structures on the Site would be demolished. It is estimated that approximately 3,992m^3 of waste would arise from the demolition of the structures across the Site. In addition, excavation of the basements, drainage routes and piling would generate approximately 103,800m^3 (assumed to be equivalent to 103,800 tonnes) of spoil.

7.68. Owing to the nature of the works, it is anticipated that the materials arising from the demolition and excavation works are likely to largely include the following:

- Brick;
- Concrete;
- Hardstanding; and
- Soil (including Made Ground).

7.69. As identified in Chapter 6: *Development Programme, Demolition and Construction*, the buildings to be demolished could include Asbestos Containing Material (ACM). Since asbestos is classified as a hazardous waste, any asbestos or other hazardous waste identified during demolition would be removed and disposed of by specialist waste contractors in accordance with the Hazardous Waste Regulations 2009.

7.70. To ensure compliance with the SWMP Regulations, 2008 and that waste is managed in a sustainable manner during demolition, excavation and construction, a SWMP would be implemented by the appointed Contractor. This would ensure that waste is managed in accordance with relevant legislation and that, where feasible, waste is segregated to facilitate reuse and recycling.

7.71. Whilst there is likely to be limited opportunity for the reuse of demolition and excavation materials on the Site, wherever feasible demolition material and inert excavation material would be reused on the Site, for instance as piling mat or non-structural fill. Therefore, it is proposed that inert waste would either be reused on the Site or exported to other construction sites, or disposed of in line with relevant legislation.

7.72. It is inevitable that waste would arise from the demolition and excavation works, and in accordance with Table 7.1, it is anticipated that the demolition and excavation works could lead to a temporary large increase in waste generation from the Site. The implementation of a mandatory SWMP would ensure that waste is managed in accordance with relevant legislation and ensure, where feasible, that opportunities for using recycled and reused materials are identified. In accordance with the significance criteria it is anticipated that the envisaged moderate reuse and recycling rate, as a result of the implementation of the SWMP, which would likely lead to a **temporary**, **adverse effect** of **minor significance** on the quantity of demolition and excavation waste generated within LBI and LBC.

Development Scenario 2

7.73. To facilitate Development Scenario 2, the existing buildings and some of the structures on the Calthorpe Street site would be demolished, which would generate approximately 3,014m^3 of waste. In addition, 55,304m^3 of spoil (assumed to be equivalent to 55,304 tonnes) would arise from the excavation and groundworks proposed on the Calthorpe Street site. Adherence to the legislative requirements as described for Development Scenario 1 would apply for Development Scenario 2.

7.74. Whilst the implementation of a mandatory SWMP (as described above) would ensure that waste is managed in accordance with relevant legislation, is anticipated that the demolition and excavation works could lead to a temporary large increase in waste generation from the Calthorpe Street site. In accordance with the significance criteria it is anticipated that the envisaged moderate reuse and recycling rate, as a result of the implementation of the SWMP, which would likely lead to a **temporary**, **adverse effect** of **minor significance** on the quantity of demolition and excavation waste generated within LBI.

Development Scenario 3

7.75. To facilitate Development Scenario 3, all of the existing buildings on the Phoenix Place site and remnants of walls would be demolished, generating approximately 978m^3 of waste. In addition, 48,496m^3 of spoil (assumed to be equivalent to 37,306 tonnes) would arise from the basement excavation works. Adherence to the legislative requirements as described above for Development Scenario 1 would apply for Development Scenario 3.

7.76. Whilst the implementation of a mandatory SWMP (as described above) would ensure that waste is managed in accordance with relevant legislation, is anticipated that the demolition and excavation works could lead to a temporary large increase in waste generation from the Calthorpe Street site. In accordance with the significance criteria it is anticipated that the envisaged moderate reuse and recycling rate, as a result of the implementation of the SWMP, which would likely lead to a **temporary**, **adverse effect** of **minor significance** on the quantity of demolition and excavation waste generated within LBC.

Construction Waste

Development Scenario 1

7.77. Construction waste would be generated at all stages during the construction process, from structural and foundation works to the fit-out of the new buildings. Table 7.3 outlines the estimated waste arising during the construction of Development Scenario 1.

Table 7.3: Estimation of Waste Arising During Construction of Development Scenario 1

Site	Land Use	Floor Area of Proposed Development (m^2 GIA)	Waste Generated (m^3)
Phoenix Place Development	Residential	38,723	7,009
	Retail / Community (Flexible Use)	822	172
	Basement	10,189	1,865
Phoenix Place Development Total		49,734	9,046
Calthorpe Street Development	Residential	38,014	6,881
	Retail / Community (Flexible Use)	1,428	298
	Basement	5,024	919
	Office	4,260	843
Calthorpe Street Development Total		48,726	8,941
Entire Development Total		**98,460**	**17,987**

7.78. Using BREs waste generation rates, it is estimated that Development Scenario 1 would produce approximately 17,987m^3 of waste (assumed to be equivalent to 17,987 tonnes) during the construction period. Although the rate of waste generation would vary, based on a total construction period of approximately 5 years 4 months it is estimated that an average of 3,373m^3 of waste would be generated per year.

7.79. The following waste streams would likely be generated based on the proposed construction materials:

- Concrete, plaster and cement;
- Steel and other metals;
- Glass and glass cladding;
- Timber; and
- Packaging waste comprising plastic, cardboard and paper, etc.

7.80. The types and quantity of waste generated would vary throughout the construction programme, with a large proportion of the waste in the early stages being concrete and steel. In the later stages a higher proportion of packaging is anticipated.

7.81. Development Scenario 1 would make use of prefabricated materials, where possible, including the use of glazed panelling for the façades. This would significantly reduce material wastage on the Site. Recycled aggregate would also be used in the construction where feasible in order to reduce the amount of virgin material used. Waste would also be reduced by measures such as ordering materials cut to size, returning any damaged goods to the manufacturer and specifying materials with minimal packaging, included within the SWMP.

7.82. As with demolition and excavation waste, any construction waste that could not be reused on the Site would be recycled offsite as far as practically possible. Where recycling is not possible, the waste would be disposed of in accordance with relevant legislation as outlined above.

7.83. As described above, the implementation of a SWMP and adoption of good waste minimisation methods would assist in reducing waste and ensure, where feasible, that waste is either reused or recycled. On the basis of a large increase in waste during construction, and an envisaged moderate reuse and recycling rate, it is considered that the overall LBI / LBC-wide effect of waste generated during the construction works would be **temporary, adverse** and of **minor significance**.

Development Scenario 2

7.84. As shown in Table 7.3, it is estimated that Development Scenario 2 would produce approximately 8,941m^3 of waste during the construction period. Although the rate of waste generation would vary, based on a total construction period of approximately 4 years and 4 months, an average of approximately 2,063m^3 of waste would be generated per year. The waste streams would likely be similar to those arising during the construction of Development Scenario 1.

7.85. In common with Development Scenario 1, Development Scenario 2 would make use of prefabricated materials where possible, including the use of glazed panelling for the façades. Recycled aggregate would also be used in construction, where feasible, in order to reduce the amount of virgin material used. Again, waste would be reduced by measures such as ordering materials cut to size, returning of damaged goods to the manufacturer and specifying materials with minimal packaging, included within the SWMP.

7.86. As described above, the implementation of a SWMP and adoption of good waste minimisation methods would assist in reducing waste and ensure, where feasible, that waste is either reused or recycled. On the basis of a large increase in waste being generated during construction, and an envisaged moderate reuse and recycling rate, it is considered that the overall LBI wide effect of waste generated during the construction works would be **temporary, adverse** and of **minor significance**.

Development Scenario 3

7.87. As shown in Table 7.3, it is anticipated that Development Scenario 3 would produce 9,046m^3 of waste during the construction period. Although the quantity of waste would vary, based on a total construction period of approximately 3 years 9 months it is anticipated that approximately 2,412m^3 of waste would be generated per year.

7.88. As for Development Scenario 1, Development Scenario 3 would make use of prefabricated materials where possible, including the use of glazed panelling for the façades. Recycled aggregate would also be used in construction, where feasible, in order to reduce the amount of virgin material used. Waste would also be reduced by measures such as ordering materials cut to size, returning of damaged goods to the manufacturer and specifying materials with minimal packaging, included within the SWMP.

7.89. As described above, the implementation of a SWMP and adoption of good waste minimisation methods would assist in reducing waste and ensure, where feasible, that waste is either reused or recycled. On the basis of a large increase in waste during construction, and a moderate reuse and recycling rate, it is considered that the overall LBC wide effect of waste generated during the construction works would be **temporary, adverse** and of **minor significance**.

Completed Development

Development Scenario 1

7.90. Table 7.4 below outlines the estimated waste generated from completed and operation Development Scenario 1 (Entire Development).

Table 7.4: Estimated Waste Generated from each Development Scenario

Site	Land Use	Floor Area of Proposed Development (m^2 GIA)	Typical Waste Generated Rates per Week	Weekly Waste Generation (m^3)
Phoenix Place Development	Residential	38,723	(number of dwellings x (70 x average number of bedrooms) + 30) / 1,000[a]	53.19
	Retail/Community (Flexible Use)	822	0.3 to 0.6m^3 per 100m^2 of floorspace per day[b]	17.26 to 34.52
Phoenix Place Development Total		**39,545**		**70.45 to 87.71**
Calthorpe Street Development	Residential	38,014	(number of dwellings x (70 x average number of bedrooms) + 30) / 1,000[a]	51.80
	Office	4,260	1.5litres / m^2[c]	6.39
	Retail/Community (Flexible Use)	1,428	0.3 to 0.6m^3 per 100m^2 of floorspace per day[b]	29.99 to 59.98
Calthorpe Street Development Total		**43,702**		**88.18 to 118.17**
Entire Development Total				**158.63 to 205.88**

Notes
a. Based on British Standard (BS) 5906:2005
b. Based on Planning for Sustainable Communities: A Code of Practice on Waste Infrastructure and Management
c. Based on Planning for Sustainable Communities: A Code of Practice on Waste Infrastructure and Management

7.91. As presented in Table 7.4, once completed and operational, Development Scenario 1 would likely generate approximately 8,249 to 10,706m^3 per annum of waste associated with residential, office, retail and community uses. This would equate to a large increase compared to the baseline, which is inevitable because of the greater quantum of floorspace proposed.

7.92. The design and proposed waste management strategy for Development Scenario 1 is discussed in detail in SKM Enviros' Operational Waste Plans for the Calthorpe Street Development and the Phoenix Place Development.

7.93. Based on the waste storage and recycling facilities provided within the Entire Development (i.e. 175 1,100 litre storage bins, 13 360 litre and nine litre food storage bins), it is envisaged that up to 50% of residential waste generated could be recycled within the Calthorpe Street Development, which is in line with the national recycling targets for 2020, and up to 30% of residential waste generated could be recycled within the Phoenix Place Development, which is below the national target for 2020. When compared to the significance criteria presented in Table 7.1 this equates to a moderate to low rate of recycling respectively.

7.94. Based on the waste facilities and the anticipated composition of waste, it is envisaged that up to 50% of commercial waste generated could be recycled within the Calthorpe Street Development and up to 30% of commercial waste generated could be recycled within the Phoenix Place Development, which is below the national target for 2020. When compared to the significance criteria presented in Table 7.1, this equates to a low rate of recycling. However, according to the Operational Waste Plans, the waste and recycling storage areas were discussed and agreed with LBI and LBC respectively.

7.95. Development Scenario 1 would result a large increase in the volume of waste currently produced at the Site, which is considered to be a large increase in waste generation. In view of the above the residential and commercial waste generated from Development Scenario 1 is expected to have a **long-term**, **district level adverse effect** of **minor** to **moderate significance**, depending on the rate of recycling.

Development Scenario 2

7.96. As presented in Table 7.4, Development Scenario 2 is anticipated to generate approximately 4,585 to 6,145m^3 per annum of waste. This would equate to a large increase when compared to the baseline.

7.97. The design and proposed waste management strategy for Development Scenario 2 is discussed in detail in SKM Enviros' Operational Waste Plan for the Calthorpe Street Development.

7.98. Based on the facilities provided within the Calthorpe Street Development (i.e. 86 1,100 litre bins and 13 360 litre food storage bins) and the anticipated composition of waste, it is envisaged that up to 50% of residential waste generated could be recycled, which is in line with the national recycling targets for 2020. When compared to the significance criteria presented in Table 7.1 this equates to a moderate rate of recycling.

7.99. Based on the waste storage facilities provided and the anticipated composition of waste, it is envisaged that up to 50% of commercial waste generated from the Calthorpe Street Development would be recycled, which is slightly below the national target for 2020. When compared to the significance criteria presented in Table 7.1, this equates to a low rate of recycling. However, according to the Calthorpe Street Development Operational Waste Plan, the waste and recycling storage areas were discussed and agreed with LBI.

7.100. Development Scenario 2 would result in a large increase in the volume of waste generated at the Calthorpe Street site. Thus, waste generated from Development Scenario 2 is expected to have a **long term**, **district level adverse effect** of **minor** to **moderate significance**.

Development Scenario 3

7.101. As presented in Table 7.4, once completed and operational, Development Scenario 3, is anticipated to generate approximately 3,663 to 4,561m^3 per annum of waste.

7.102. The design and proposed waste management strategy for Development Scenario 3 is discussed in detail in SKM Enviros' Operational Waste Plan for the Phoenix Place Development. Based on the facilities provided (i.e. 89 1,100 litre bins and nine 500 litre food storage bins) and the anticipated composition of waste, it is envisaged that 30% of residential waste generated would be recycled, which is below the national target for 2020. When compared to the significance criteria presented in Table 7.1, this equates to a moderate to low rate of recycling.

7.103. Based on the facilities provided and the anticipated composition of waste, it is envisaged that 30% of commercial waste generated would be recycled, which is below the national target for 2020. When compared to the significance criteria presented in Table 7.1, this equates to a low rate of recycling. However, according to the Phoenix Place Operational Waste Plan, the waste and recycling storage areas were discussed and agreed with LBC.

7.104. Development Scenario 3 would result in a large increase in the volume of waste, and given the anticipated recycling rates, residential and commercial waste generated from Development Scenario 3 is expected to have a **long term**, **district level adverse effect** of **minor** to **moderate significance**.

Mitigation Measures

Demolition and Construction

Development Scenario 1

7.105. The implementation of a SWMP during the demolition and construction stages would be mandatory. This would ensure that waste is minimised and that the management of waste is driven up the waste hierarchy during the demolition, excavation and construction works.

7.106. The SWMP would be submitted to LBC and LBI for approval prior to the commencement of works and would be implemented by the appointed Contractor. The SWMP would include the following measures:

- Ordering materials that are cut to size, rather than standard cuts;
- The use of pre-fabricated materials;
- Reduce over-ordering and ensuring the careful storage of materials to prevent damage;
- Return damaged goods to the manufacturer;
- Specify materials to be delivered with minimum packaging; and
- Reuse waste material within the Site.

7.107. A Construction Environmental Management Plan (CEMP) would be prepared for the Calthorpe Street site and the Phoenix Place site, which would include all details of relevant environmental management controls necessary for environmental protection during the demolition and construction works, including waste management (refer to Chapter 6: *Development Programme, Demolition and Construction*).

7.108. To maximise reuse and recycling, waste would be segregated at source within the Site using clearly labelled and / or colour coded skips and bins. Inert waste would be reused as far as practicable on-Site and options for using additional waste at other construction projects in the vicinity would be investigated. Appropriate waste recycling companies that provide facilities to recycle Site waste that cannot be reused would be identified.

7.109. No further mitigation would be required in respect of construction waste which is not already prescribed by relevant legislation.

Development Scenario 2

7.110. Development Scenario 2 would adhere to the same mitigation as described under the mitigation for Development Scenario 1.

Development Scenario 3

7.111. Development Scenario 3 would adhere to the same mitigation as described under the mitigation for Development Scenario 1.

Completed Development

Development Scenario 1

7.112. On completion of Development Scenario 1, future occupants would be provided with information on reducing, reusing, recycling and composting waste. Future residents would be provided with information on the waste management system and the accepted materials to be placed in each type of bin. All communal bins would be clearly colour coded to minimise any contamination of segregated waste.

7.113. Information would be provided to retailers and occupants of commercial units on their responsibilities and the management of waste. It would also highlight the potential cost savings of waste management services and encourage, for example, the:

- Use of recycled paper;
- Reuse and recycling of packaging, envelopes and scrap paper;
- Segregation of paper, card and where appropriate cans, glass and organic materials to maximise recycling and composting;
- Use of email and CDs rather than distributing hard copies;
- Return of all ink cartridges to suppliers for refilling rather than disposal;
- Recycling of furniture; and
- Use of rechargeable batteries.

Development Scenario 2

7.114. Development Scenario 2 would adhere to the same mitigation as described for Development Scenario 1.

Development Scenario 3

7.115. Development Scenario 3 would adhere to the same mitigation as described for Development Scenario 1.

Likely Residual Effects

Demolition and Construction

Development Scenario 1

7.116. The SWMP would assist in maximising the reuse and recycling of demolition and construction waste in accordance with the waste hierarchy. The SWMP would also ensure that waste is managed in accordance with legislation such as the Duty of Care Regulations.

7.117. The implementation of a SWMP and CEMPs would ensure that waste generated during excavation, demolition and construction would be reused or recycled where feasible, failing which, it would be disposed of in accordance with relevant legislation. It is, therefore, considered that the likely residual effect of waste generated during the demolition and construction phases of Development Scenario 1 would likely be **temporary**, **adverse** and of **minor significance**.

Development Scenario 2

7.118. As for Development Scenario 1, the SWMP and CEMP would assist in maximising the reuse and recycling of demolition waste in accordance with the waste hierarchy and ensure that waste is managed in accordance with relevant legislation. The likely residual effect of Development Scenario 2 on demolition and construction waste generation would be **temporary**, **adverse** and of **minor significance**.

Development Scenario 3

7.119. As for Development Scenario 1 and 2, the SWMP and CEMP would assist in maximising the reuse and recycling of demolition waste in accordance with the waste hierarchy and ensure that waste is managed in accordance with relevant legislation. The likely residual effect of Development Scenario 2 on demolition and construction waste generation would be **temporary**, **adverse** and of **minor significance**.

Completed Development

Development Scenario 1

7.120. Recycling rates within Development Scenario 1 would be dependent on the procedures implemented by future occupants. However, the level of recycling would be dependent on the occupants / tenants. Development Scenario 1 would include recycling facilities (such as dry recycling containers, food waste containers, bulky waste storage and colour coded bags) to achieve a recycling rate of 50% (within the Calthorpe Street Development) and 30% (within the Phoenix Place Development) of residential and commercial waste generated, and therefore, the likely residual effect of the Development Scenario 1 on waste generation would be **long term**, **adverse** and of **minor** to **moderate significance** at district level.

Development Scenario 2

7.121. As for Development Scenario 1, recycling rates within Development Scenario 2 would be dependent on the procedures implemented by future occupants. However, the level of recycling would be dependent on the occupants / tenants. Development Scenario 2 would include recycling facilities to achieve a recycling rate of 50% of residential and commercial waste generated, and therefore, the likely residual effect of the Development Scenario 2 on waste generation would be **long term**, **adverse** and of **minor** to **moderate significance** at district level.

Development Scenario 3

7.122. Recycling rates within Development Scenario 3 would be dependent on the procedures implemented by future occupants. However, the level of recycling would be dependent on the occupants / tenants. Development Scenario 3 would include recycling facilities to achieve a recycling rate of 30% of residential and commercial waste generated, and therefore, the likely residual effect of the Development Scenario 1 on waste generation would be **long term**, **adverse** and of **minor** to **moderate significance** at district level.

Conclusion

7.123. The summary of potential effect, mitigation measures and likely residual effects in relation to each of the Development Scenarios is provided below in Table 7.10.

Table 7.10: Summary of Potential Effects, Mitigation Measures and Likely Residual Effects

Issue	Potential Effect / Significance	Mitigation Measures	Likely Residual Effect / Significance
Demolition and Construction			
Development Scenario 1			
Demolition and excavation waste	**Temporary, adverse effect** of **minor significance**.	The implementation of an SWMP and CEMPs would maximise the recycling and reuse of inert demolition and excavation waste; and disposal of any remaining waste in line with applicable legislation.	**Temporary, local, adverse effect *of* minor significance.**
Construction waste	**Temporary, adverse effect** of **minor significance.**	The implementation of an SWMP and CEMP would minimise waste and maximise reuse and recycling.	**Temporary, local, adverse effect** of **minor significance.**
Development Scenario 2			
Demolition and excavation waste	**Temporary, adverse effect** of **minor significance**.	The implementation of an SWMP and CEMP would maximise the recycling and reuse of inert demolition and excavation waste; and disposal of any remaining waste in line with applicable legislation.	**Temporary, local, adverse effect** of **minor significance**.
Construction waste	**Temporary, adverse effect** of **minor significance**.	The implementation of an SWMP and CEMP would minimise waste and maximise reuse and recycling.	**Temporary**, **local, adverse effect** of **minor significance**.
Development Scenario 3			
Demolition and excavation waste	**Temporary, adverse effect** of **minor significance.**	The implementation of an SWMP and CEMP would maximise the recycling and reuse of inert demolition and excavation waste; and disposal of any remaining waste in line with applicable legislation.	**Temporary, local, adverse effect** of **minor significance.**
Construction waste	**Temporary, adverse effect** of **minor significance.**	The implementation of an SWMP and CEMP	**Temporary, local, adverse**

Issue	Potential Effect / Significance	Mitigation Measures	Likely Residual Effect / Significance
		would minimise waste and maximise reuse and recycling.	**effect** of **minor significance**.
Completed Development			
Development Scenario 1			
Generation of residential and commercial waste but with provision of sufficient space for the storage of recyclable waste within the Development	**Long-term, district, adverse effect** of **minor** to **moderate significance.**	Provision of information to tenants to reduce waste and maximise recycling.	**Long-term, district, adverse effect** of **minor** to **moderate significance**.
Development Scenario 2			
Generation of residential and commercial waste but with provision of sufficient space for the storage of recyclable waste within the Development	**Long-term, district, adverse effect** of **minor** to **moderate significance**.	Provision of information to tenants to reduce waste and maximise recycling.	**Long-term, district, adverse effect** of **minor** to **moderate significance.**
Development Scenario 3			
Generation of residential and commercial waste but with provision of sufficient space for the storage of recyclable waste within the Development	**Long-term, district, adverse effect** of minor to **moderate significance.**	Provision of information to tenants to reduce waste and maximise recycling.	**Long-term, district, adverse effect** of **minor** to **moderate significance.**

References

1 Accessed March 2013: http://ec.europa.eu/environment/waste/framework/index.htm
2 HMSO, 2011 'The Waste (England and Wales) Regulations 2011 (SI 2011 No. 988).
3 Official Journal of the European Communities, 26 April 1999. Council Directive 1999/31/EC Landfill of Waste
4 HMSO, 2002, 'Landfill Regulations, (SI 2002 No. 1559).'
5 HMSO, 2011, The Waste (England and Wales) Regulations 2011.
6 HMSO, 2008, The Site Waste Management Plans Regulations, 2008 (SI 2008 No. 314)
7 Environmental Protection (Duty of Care) Regulations, 2003
8 Department For Communities and Local Government (DCLG) (2011) Draft National Planning Policy Framework Draft.
9 Department For Communities and Local Government (DCLG) (2011). Planning Policy Statement 10 - Planning for Sustainable Waste Management. TSO. London
10 Department for Environment, Food and Rural Affairs, 2007. The Waste Strategy for England 2007.
11 Greater London Authority (GLA), 'The London Plan, Spatial Development Strategy for Greater London', 2011
12 Greater London Authority (GLA), 'The London Plan, Spatial Development Strategy for Greater London Revised Early Minor Alterations' Draft, June 2012
13 Mayor of London, 2011, The Mayor's Municipal Waste Management Strategy: London's Wasted Resource, GLA, London.
14 The Mayor of London, 2011, Making Business Sense of Waste - The Mayor's Business Waste Management Strategy for London, GLA, London.
15 London Borough of Islington (2012) Development Management Policies Submission, June 2012
16 London Borough of Islington (2012) Site Allocation Submission
17 Draft North London Waste Plan (NLWP), February 2012
18 London Borough of Islington (2011) Finsbury Local Plan 'Area Action Plan for Bunhill and Clerkenwell', Proposed Submission October 2011
19 London Borough of Islington (2011) Islington Core Strategy, February 2011
20 London Borougn of Islington (2002) Unitary Development Plan, Saved Policies, 2002
21 London Borough of Camden (2012) Camden Site Allocations Local Development Framework Proposed Submission Document, March 2012
22 London Borough of Camden (2010) Camden's Core Strategy 2010 - 2025 Local Development Framework
23 London Borough of Camden (2010) Camden Development Policies 2010 – 2025 Local Development Framework
24 London Borough of Camden and London Borough of Islington (2012) Mount Pleasant Supplementary Planning Document, February 2012
25 Department for Environment, Food and Rural Affairs (2009) Commercial and Industrial Waste in England, Statement of Aims and Actions, 2009
26 Supplementary Planning Guidance - Sustainable Design and Construction, 2006
27 London Borough of Islington Noise Service 'Code of Practice for Construction Sites', 2006
28 London Borough of Camden 'Guide for Contractors Working in Camden', February 2008
29 Accessed March 2013: www.capitalwastefacts.com
30 Accessed March 2013: http://www.defra.gov.uk/news/2010/08/05/waste-stats/
31 BRE Waste Benchmark Data. June 2012
32 London Borough of Islington (2012) Refuse and Recycling Storage Requirements, March 2012
33 London Borough of Camden (2005) Waste Storage Requirements 'A Guide to Developers of Commercial and Residential Premises in the London Borough of Camden' May 2005
34 Greater London Authority, 2004, Waste Composition Scoping Study.
35. DEFRA, November 2012. Local Authority Collected Waste Management Statistics for England – Final Annual Results 2011/12.
36 Environment Agency, November 2011. Islington London Borough Environmental Fact Sheet
37 Environment Agency, November 2011. Camden London Borough Environmental Fact Sheet
38 Accessed March 2013: http://www.defra.gov.uk/statistics/environment/waste/wrfg03-indcom/

8. Socio-Economics

Introduction

8.1. This Chapter, which was written by Volterra Partners, presents an assessment of the likely significant effects of the Development Scenarios upon the local and regional socio-economic conditions; particularly in relation to employment opportunities, demand on education, healthcare and community facilities.

8.2. In undertaking the assessment, consideration was given to relevant national, regional and local planning policies. The potential effects of the Development Scenarios are described and assessed, together with any mitigation required to prevent, reduce or offset any potentially significant adverse effects. The Chapter concludes with a description of the nature and significance of the likely residual socio-economic effects, taking into account any mitigation measures.

8.3. A Health Impact Assessment was also undertaken in relation to the Development Scenarios, although this is presented as a standalone document that accompanies the planning applications.

Legislation, Planning Policy and Guidance

National Planning Policy

National Planning Policy Framework, 2012

Achieving Sustainable Development

8.4. The National Planning Policy Framework (NPPF)[1] differs from previous national planning policy in that it includes a presumption in favour of sustainable development (paragraph 13). This presumption is negated only in cases where the adverse effects of a development outweigh the benefits when assessed against national planning policies.

Building a Strong, Competitive Economy

8.5. Paragraph 19 of the NPPF states that planning should proactively drive and support development. Every effort should be made to identify and meet the housing, business, and other development needs of an area, and respond positively to wider opportunities for growth.

Delivering a Wide Choice of High Quality Homes

8.6. The NPPF states that Local Planning Authorities (LPAs) should consider housing applications in the context of a presumption in favour of sustainable development (paragraph 47). The NPPF states that LPAs should approve planning applications where there is an identified need for additional housing in the area, provided there are not strong economic reasons why the development would be inappropriate (paragraph 51).

Promoting Healthy Communities

8.7. To deliver the social, recreational and cultural facilities and services that local communities need, the NPPF states that planning policies should plan for the provision of shared space and community facilities (paragraph 73). It also emphasises the importance of ensuring that a sufficient choice of school places is available to meet the needs of existing and new residents (paragraph 72).

Regional Planning Policy

The London Plan: Spatial Development Strategy for Greater London, 2011

8.8. The following policies from the adopted London Plan[2] were identified as being of relevance to this assessment:

- Policy 3.3: 'Increasing Housing Supply' identifies an annual new housing target for London of 32,210 net additional homes.
- Policy 3.5: 'Quality and Design of Housing Developments' states that the design of new housing developments should enhance the quality of local places taking into account physical context, local character, density, tenure and use mix; and relationships with, and provision of, public, communal and open spaces, taking particular account of the needs of children and older people.
- Policy 3.6: 'Children and Young People's Play and Informal Recreation Facilities' highlights the importance of access to play and informal recreation areas for children and young people. Developments that include housing should make provision for play and recreation areas in accordance with Greater London Authority (GLA) guidance[3];
- Policy 3.7: 'Large Residential Developments' states that large residential developments should be encouraged in areas of high public transport accessibility;
- Policy 3.11: 'Affordable Housing Targets' sets a target of 13,200 affordable homes per year (41% of the annual housing target) over the ten year period of the plan. The target aims for 60% of affordable housing provision to be social rented accommodation and the remaining 40% to be intermediate housing for rent or sale. LPAs are encouraged to set their own affordable housing targets that take account of current and future housing requirements;
- Policy 3.12: 'Negotiating Affordable Housing on Individual Private Residential and Mixed Use Schemes' highlights the importance of taking account of the individual circumstances of sites when negotiating the level of affordable housing in a development including the viability of the development and the implications of phasing; and
- Policy 7.1: 'Building London's Neighbourhoods and Communities' states that people should have a good quality environment in an active and supportive local community with the best possible access to local services, infrastructure and public transport to wider London.

Revised Early Minor Alterations to the London Plan, 2012

8.9. The introduction of new legislation by the Government including the NPPF and the Localism Act since the completion of the London Plan in 2011 has meant that some policies are not fully consistent with national planning policy. As such, early minor alterations to the London Plan have been introduced which are set out in the Revised Early Minor Alterations to the London Plan[4]. Revisions to the policies listed above are as follows:

- Policy 3.3: 'Increasing Housing Policy' has been amended to emphasise the importance of taking a flexible approach to setting borough level housing targets that reflect locally distinct circumstances;
- Policy 3.11: 'Affordable Housing Targets' has been amended to include affordable rent as an additional product in the intermediate housing sector alongside social rented and intermediate tenures; and
- Policy 3.12: 'Negotiating Affordable Housing on Individual Private Residential and Mixed Use Schemes' has been amended to include an additional criterion of maximising affordable housing with consideration of the resources available for funding when negotiating the affordable housing component of a development.

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

8.10. The London Borough of Islington (LBI) Development Management Policies[5] (DPD) will form part of LBI's Local Development Framework (LDF). The document is currently at modifications stage and is expected to be adopted during 2013.

- Policy DM14: 'Play Space' states that all major developments are required to make provision for play of 5m^2 per child of informal / private play space based on anticipated child yield. All development with more than 200 units where a specific need has been specified in the DPD are required to provide on-site publically accessible formal child space, working towards The London Plan standard of 10m^2 per child;
- Policy DM21: 'Promoting Islington's Town Centres' states that applications for more than 80m^2 of A or D2 use classes must demonstrate that "*the development would not individually, or cumulatively with other developments, have a detrimental impact on the vitality and viability of town centres within Islington or in adjacent boroughs*";
- Policy DM29: 'Social and Strategic Infrastructure and Cultural Facilities' states that provision of new social infrastructure and cultural facilities will be sought as part of large mixed-use developments. Developments that result in additional need for social infrastructure or cultural facilities will be required to contribute towards enhancing existing infrastructure/facilities, or provide / contribute towards new infrastructure / facilities. The contribution will be addressed through a Community Infrastructure Levy (CIL) and / or Section 106 obligations, as appropriate;
- Policy DM34: 'Healthy Development' states planning obligations will be negotiated to secure additional health services from developments in excess of 200 residential units where needs are not adequately addressed through the CIL; and
- Policy DM35: 'New and Improved Public Open Spaces' states that developments in excess of 200 units are required to provide on-site publicly accessible public open space.

London Borough of Islington's Site Allocations Submission, 2012

8.11. LBI's Site Allocations[6] document forms part of the LDF. The Site is not referred to within the Site Allocations document.

London Borough of Islington's Finsbury Local Plan Submission, 2012

8.12. Policy BC6: 'North Clerkenwell and Mount Pleasant' from the emerging Finsbury Local Plan[7] sets out a policy for the North Clerkenwell and Mount Pleasant area. Of particular relevance are the requirements for:

- A high quality public realm surrounding and throughout a site with a substantial amount of new fully accessible public space and play space;
- Provision of a mix of uses which define and lend character to different parts of a site and which include facilities for both residents and visitors as well as small shops and workspaces; and
- A mix of employment uses including offices, small and affordable workspaces, shops, cafés and restaurants.

London Borough of Islington's Core Strategy, 2011

8.13. LBI's adopted Core Strategy[8] contains a number of policies relevant to this assessment, as follows:

- Policy CS 7: 'Bunhill and Clerkenwell' states, in relation to Clerkenwell, that "*the area is home to a significant residential community. Housing growth will be sought across the area to meet the needs of the current population and to cater for increased demand. A wider range of dwelling types, affordable tenures and family-sized homes will be encouraged to ensure that a mixed community can be accommodated*". The policy continues "*to meet the needs of the growing population improvements to community facilities will be sought. These will be met through the provision of improved, expanded or merged facilities focused in accessible places, such as neighbourhood centres. Better use will be made of underused land and buildings, including car parks and garage spaces, by transferring them into residential, local employment, community and / or open space use*"; and
- Policy CS 12: 'Meeting the Housing Challenge' sets out LBI's housing strategy, which aims to meet and exceed the Borough housing target set of 1,170 homes per year set out in the adopted London Plan. LBI aims to provide 50% of Borough-wide housing as affordable. This implies an annual affordable housing target of 585 new units.
- Policy CS 16: 'Play Space' states the LBI will require developers to provide new inclusive play space as part of new developments, particularly in those areas that have the greatest predicted increases in child population.

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

8.14. One saved policy in LBI's Unitary Development Plan[9] (UDP) is considered relevant to this assessment. Policy CS15: 'Open Space' states that "*the Council will seek to achieve new areas of private and public open space in the area as part of new development proposals*".

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

8.15. The London Borough of Camden's (LBC) Site Allocations Proposed Submission Document[10] lists Phoenix Place (site 28) as one of the key development sites in the Borough. The Site Allocation document seeks to:

- Maximise the potential of the site to provide new housing;
- Accommodate other appropriate uses such as employment, cultural and community uses;
- Provide a range of new open spaces; and
- Meet the more detailed key objectives of the Mount Pleasant Supplementary Planning Document (SPD)[11].

London Borough of Camden's Core Strategy, 2010-2025, 2010

8.16. LBC's adopted Core Strategy[12] contains a number of relevant policies, as follows:

- Policy CS6: 'Providing Quality Homes' sets a target of supplying 595 homes per year. LBC aims to provide 50% of Borough-wide housing as affordable with a guideline of 60% social rented housing and 40% intermediate affordable housing;
- Policy CS8: 'Promoting a Successful and Inclusive Camden Economy' states that LBC expects a mix of employment facilities and types. The policy also promotes the provision of office space in Central London to meet the forecast demand of 615,000m^2 by 2026; and

- Policy CS10: 'Supporting Community Facilities and Services' states that LBC will require development that increase demand for community facilities and services to make appropriate contributions towards providing new facilities or improving existing facilities.

London Borough of Camden's Development Policies 2010-2025, 2010

8.17. LBC's Development Management Policies[13] includes the following relevant policies:

- Policy DP1: 'Mixed Use Development' states that LBC will require a mix of uses in development where appropriate including a contribution towards the supply of housing. In the Central London Area, 50% of additional floorspace is required to be housing;
- Policy DP3: 'Contributions to the Supply of Affordable Housing' requires developments with greater than 50 residential units to provide 50% of their units as affordable. Where a affordable housing contribution is sought, the LBC will take into account the scale and nature that would be appropriate including access to public transport, the character of the area, the financial viability of the development and the impact on the creation of mixed and inclusive communities; and
- Policy DP15: 'Community and Leisure' uses states that the LBC will require developments that result in additional need for community or leisure facilities to contribute towards supporting existing facilities or providing new facilities.

Mount Pleasant Supplementary Planning Document, 2012

8.18. The adopted Mount Pleasant SPD[11] outlines the relevant planning policies that should be addressed by redevelopment proposals for the Site. The SPD highlights the development objectives shared by both LBI and LBC. These are:

- Creating a new neighbourhood which integrates fully into the local area and supports a new mixed and balanced community;
- Providing new housing, particularly affordable housing;
- Promoting a strong local economy that provides a range of opportunities for different types and sizes of businesses; and
- Creating new high quality and inclusive public spaces for local people both on the site and at its four corners.

Guidance

Mayor's Supplementary Planning Guidance: Shaping Neighbourhoods - Play and Informal Recreation, 2012

8.19. Policy 3.6 of the adopted Shaping Neighbourhoods - Play and Informal Recreation Supplementary Planning Guidance[14] (SPG) highlights the importance of play space, emphasising that "*all children and young people have safe access to good quality, well designed, secure and stimulating play and informal recreation provision, incorporating trees and greenery wherever possible*". Therefore, play space should be an important consideration in development proposals which include housing for young people.

8.20. The SPG states that "*whilst the Mayor will expect provision to be made on-site, off-site play provision including the creation of new provision, improvements to existing play facilities and / or an appropriate financial contribution secured by legal agreement towards this provision may be acceptable in accordance with Policy 3.6 where it can be demonstrated that there are planning constraints and that it fully satisfies the needs of the development whilst continuing to meet the needs of existing residents*".

Assessment Methodology and Significance Criteria

Assessment Methodology

8.21. No published standards or guidance currently exist for undertaking socio-economic assessments. The potential socio-economic effects of the Development Scenarios were assessed against the future baseline conditions pertaining to the Site and local area, together with local, regional and national policy. Wherever possible, the assessment is quantified but where this is not feasible, a qualitative assessment is made using professional experience and judgement.

8.22. It should be noted that although the assessment of socio-economic effects focuses on the likely changes as compared against the future baseline conditions of the Site, local and regional socio-economic baseline data readily available from the Government sources referred to below relate to 2011 or before. Therefore, whilst the local and regional socio-economic baseline data relate to the current conditions, for the purposes of this assessment it was assumed that these data are also applicable to the future baseline.

8.23. The socio-economic assessment was based on the following methodology and sources:

- A review of national, regional and local planning policies, guidance and standards;
- A review of relevant data and information from various statistical sources including:
  - The 2011 Census (and subsequent mid-year estimates)[15];
  - The Annual Population Survey[16];
  - The Annual Survey of Hours and Earnings[17];
  - Department for Communities and Local Government (DCLG) data on deprivation[28];
  - Department for Education (DfE) data on early years, primary and secondary education[35 & 37];
  - Data supplied by the National Health Service (NHS) Information Centre[40 & 41];
- Identification and assessment of the potential effects of the Development Scenarios using well-established, proprietary assessment models and standard assessment procedures, supplemented by professional judgement as appropriate, in respect of the following:
  - An estimation and quantification of the direct and indirect Full Time Equivalent (FTE) jobs generated by the demolition and construction works. FTE construction jobs are estimated using output per construction worker in Inner London[18 & 19] (a standard HM Treasury assumption of 10 job years per full time equivalent (FTE) job), the estimated cost of the demolition and construction works provided by the quantitative surveyor (Davis Langdon) and the estimated duration of demolition and construction work provided by the construction advisor (Mace). The duration of construction at each Development Scenario is applied to the estimated job years in order to estimate the average FTE construction jobs per year;
  - An estimation of temporary construction worker expenditure. This is based on the estimation of the average annual number of FTE workers for each Development Scenario and an assumption of 60% of the workers spending £5 per day;
  - An assessment of the displacement and creation of direct and indirect jobs generated by the Development Scenarios once completed and operational. Estimates of direct jobs created at the regional level were made using the proposed floorspace for each Development Scenario and standard employment densities for the Department for Communities and Local Government (DCLG) Employment Densities Guide[20]. Where use classes are designated as flexible (i.e. retail / community Use Classes), the employment

density use class with the lowest employment generation potential was used. Information about existing employment was provided by the Applicant. Estimates of indirect jobs at district and regional level were calculated using English Partnerships' Additionality Guide[21];

- An estimation and quantification of the population and potential child yield associated with each Development Scenario. Population yield was calculated using data from the Islington Housing Needs Assessment 2007[22]. A housing needs assessment is available for Camden[23] but does not contain similar data. Given the likely similar socio-economic profile of the Calthorpe Street site and the Phoenix Place site and the need for comparability, these population yield estimates are used for all Development Scenarios;
- An estimation and quantification of local spend created by each Development Scenario once completed and operational. Estimates of worker spending were derived from a summation of discretionary spending items in Office of National Statistics (ONS) Family Spending 2011[24], assuming 40% leakage of this expenditure from the local area and 10% leakage from the region using English Partnerships' Additionality Guide. Estimates for the resident population spending were based on average individual spending (not including housing costs; based on average London household size) in London[24] and estimated spending leakage from local area and region using English Partnerships' Additionality Guide;

- A qualitative assessment of the effect of estimated population from each Development Scenario on primary healthcare facilities, schools, public facilities and open space / children's playspace. Information was derived from the National Health Service (NHS) Information Service statistics[39, 40 & 41], Department for Education School Census[35, 37 & 38] and Islington and Camden Council Childcare Assessments[25 & 26];
- A qualitative assessment of the effect of each Development Scenario having regard to the perception of crime, safety and wellbeing. Information was derived from Metropolitan Police official crime statistics[27] and DCLG Indices of Deprivation 2012[28]; and
- A qualitative assessment of the effect of each Development Scenario on retail uses in the local area having regard for the likely effects on town centre and other local retail frontages within the Central Activities Zone (CAZ). The assessment was limited to a review of planning policy(Islington and Camden Core Strategies and Development Management Policies) and review of the existing Islington and Camden evidence base relating to retail (Camden and Islington Retail Studies[45 & 46]).

8.24. Potential effects on community receptors are largely localised, and thus a study area of 1km radius was used for this element of the assessment (see Figure 8.1). Similarly, while there is no discrete boundary for assessing the potential effects upon the local economy, labour market data for LBI and LBC and the local wards (principally Clerkenwell, Holborn & Covent Garden and Kings Cross wards) were referred to. The study area for the assessment of healthcare facilities, primary education services, community facilities and open space is limited to a radius of approximately 1km; the standard reasonable walking distance from the Site for accessing facilities. The study area for the assessment of secondary education services is limited to approximately 2km representing the longer average distance travelled by secondary school students to school.

Significance Criteria

8.25. The scale of significance described as follows, together with expert judgement, was used to assess the likely significant effects of the Development Scenarios against the relevant baseline conditions:

- **Beneficial effects** indicate an advantageous or beneficial effect to an environmental resource or receptor, which may be **minor**, **moderate**, or **substantial** in significance;
- **Negligible effects** indicate imperceptible effects to an environmental resource or receptor; and
- **Adverse effects** indicate a disadvantageous or adverse effect to an environmental resource or receptor, which may be **minor**, **moderate** or **substantial** in significance.

8.26. In accordance with Chapter 2: *EIA Methodology*, **temporary**, **short** to **medium-term** effects are considered to be those associated with the demolition and construction works and **long-term** effects are those associated with the Development Scenarios once completed and operational. Local effects are those affecting neighbouring receptors, whilst effects upon receptors in LBI and LBC are considered to be at a **district** level. Effects across London are considered to be at a **regional** level, whilst effects on different parts of the country, or England as a whole, are considered being at a **national** level.

8.27. Some of the following considerations were used when assessing the nature of any effects:

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

Future Baseline Conditions

8.28. The Site straddles the Clerkenwell Ward in LBI and the Holborn & Covent Garden Ward in the LBC, with the Calthorpe Street site located in the Clerkenwell Ward and the Phoenix Place site located in the Holborn & Covent Garden Ward. These two wards are considered as part of the analysis of future baseline conditions.

Population

8.29. In 2011, the population of the Holborn & Covent Garden Ward (LBC) was 13,023 and the Clerkenwell Ward (LBI) was 11,490. The population of the LBC was estimated to be 214,500 in 2013, up from 201,900 in 2003, while the population of LBI was estimated to be 216,500 in 2013, up from 182,800 in 2003. Population in both Boroughs were estimated to have risen significantly between 2003 and 2013, with increases of 8.6% and 15% in LBC and LBI respectively.

8.30. Holborn & Covent Garden Ward and Clerkenwell Ward are characterised by low numbers of children relative to their total populations. Children up to 15 years old represent 11% of the wards population compared to 17% in LBC and LBI.

8.31. Table 8.1 and Table 8.2 outline population estimates for LBC and LBI by age range and by year. Figures are projections from the GLA and are rounded to the nearest 100 people. The GLA projects LBC's population to grow by 1.3% and LBI's population to grow by 2.5% by 2015 (the anticipated year of commencement of construction).

Table 8.1: Camden Population, past growth and 2015 projection

Age	2003	2013	Growth 2003 - 2013	2015 Projection
0 - 15	33,700	36,000	6.8%	36,500
16 - 64	147,300	156,900	6.5%	158,500
65+	20,900	21,600	3.3%	22,300
Total	**201,900**	**214,500**	**6.2%**	**217,300**

Source: GLA Demographic Projections 2011 round (totals may not add up due to rounding)

Table 8.2: Islington Population, past growth and 2015 projection

Age	2001	2011	Growth 2001 -2011	2019 Projection
0 - 15	31,400	33,500	6.7%	34,400
16 - 64	133,900	165,100	23.3%	169,300
65+	17,500	17,900	2.3%	18,200
Total	**182,800**	**216,500**	**18.4%**	**221,900**

Source: GLA Demographic Projections 2011 round (totals may not add up due to rounding)

Ethnicity

8.32. The National Census 2011 shows a wide variation in the level of ethnic diversity between wards in both LBC and LBI. In LBC, the ethnic minority population ranged from 49.2% in Kings Cross to 20.0% in Hampstead Town, whilst Holborn & Covent Garden had an ethnic minority population of 39.8%. In LBI, the ethnic minority population ranged from 42.9% in Finsbury Park to 23.5% in Highbury West, whilst Clerkenwell had 29.3% from ethnic minorities.

8.33. The proportion of people from ethnic minorities29 living in LBC in the twelve months to June 2012 was 35.7%, while the figure was 32.5% for LBI. These are both lower than the overall London rate of 38.5%. In LBC, 61.1% of residents were born in the UK, which is slightly lower than LBI, with 66.4% born in the UK. In London, 63.9% of residents were born in the UK.

Housing

8.34. In 2011, there were an estimated 86,000 households[29] in LBC and 76,700 households in LBI. The following data set out in Table 8.3 from the 2011 Census indicates the levels of owner occupied and council, other social and private rented housing for each Borough and ward:

Table 8.3: Housing Occupier Breakdown (%), 2011

	Owner Occupied	Shared Ownership	Total social rented	Private rented or living rent free
Boroughs				
Camden	32.2	0.7	33.1	34.0
Islington	28.4	1.3	42.1	28.3
Wards				
Holborn & Covent Garden	22.4	0.5	42.5	34.5
Clerkenwell	29.0	0.6	42.3	28.1

Source: Office for National Statistics, Census 2011

8.35. As shown in Table 8.3, all of the local wards have higher levels of social renting than the overall Boroughs, indicating higher levels of deprivation in these wards as opposed to the Borough average.

8.36. Both LBC[30] and LBI[31] have a significant shortfall in affordable housing. Much of this is attributed to overcrowding in the current housing supply. Larger homes are in particularly high demand.

Employment and Education Levels

8.37. Following completion of the modernisation of the Mount Pleasant Sorting office, there would be approximately 2,000 employees working at the Mount Pleasant Sorting Office.

8.38. Table 8.4 provides information on employment and economic activity in LBC, LBI and London for the twelve months up to and including June 2012. Also included are equivalent figures for ethnic minorities by way of comparison.

Table 8.4: Employment Statistics (%), Residents Aged 16 to 64, July 2011 to June 2012

	Camden	Islington	London
Employment rate	62.3	67.7	68.1
Unemployment rate	7.3	11.3	9.3
Economic activity rate	67.1	76.3	75.0
Economic inactivity rate	32.9	23.7	25.0
Ethnic minority employment rate	54.9	56.8	59.5
Ethnic minority economic inactivity rate	36.2	30.9	30.8

Source: ONS Annual Population Survey

8.39. As indicated in Table 8.4, employment rates are lower in LBC than London overall, however unemployment is also lower. This suggests that there are a high number of young and old dependants, or people out of the workforce for other reasons. This is supported by very high levels of economic inactivity. LBI has similar rates of employment and economic activity to London as a whole, but significantly higher unemployment.

8.40. Across LBI, LBC and London as a whole, minority groups have higher levels of economic inactivity and lower levels of employment. These differences are fairly uniform so the employment landscape, in terms of ethnicity, is similar in both LBC and LBI to London on the whole.

8.41. Table 8.5 highlights the highest level of qualification for residents in the Holborn & Covent Garden Ward, Clerkenwell Ward and both Boroughs and compared to London as a whole.

Table 8.5: Highest Level of Qualification (%), Residents Aged 16 and Over

	Holborn and Covent Garden	Clerkenwell	Camden	Islington	London
NVQ level 4+	46.2%	47.9%	50.5%	48.1%	37.7%
NVQ level 3+	14.2%	12.8%	12.1%	9.8%	10.5%
NVQ level 2+	7.9%	7.7%	7.8%	8.4%	11.8%
NVQ level 1+	7.3%	7.1%	6.8%	8.0%	10.7%
Other qualifications	11.5%	9.4%	10.1%	8.8%	11.6%
No qualifications	12.9%	15.1%	12.7%	17.0%	17.6%

Source: Annual Census 2011

8.42. As shown in Table 8.5, LBC, LBI and the wards perform better than the London average. Both Boroughs have a relatively high proportion of residents with high level qualifications, an indicator of economic prosperity.

Occupations

8.43. Table 8.6 outlines the general occupations of residents of LBC, LBI and London as a whole. Both LBC and LBI have higher than average proportions of employees in senior management roles, and significantly higher than average proportions working in professional and technical occupations. This mirrors the high levels of qualifications in these Boroughs as outlined in paragraph above.

Table 8.6: Occupations of Residents, % of those in Employment, July 2011 to June 2012

	Camden	Islington	London
Managers, directors and senior officials	13.5	12.2	11.6
Professional occupations	32.5	34.0	24.8
Associate prof and tech	26.0	21.9	17.9
Administrative and secretarial	3.3	7.4	10.6
Skilled trades	2.3	3.7	7.4
Caring, leisure and other service	6.9	6.3	7.2
Sales and customer service	5.4	4.7	6.3
Process, plant and machine operatives	3.7	2.6	4.5
Elementary occupations	6.5	6.7	9.1

Source: ONS Annual Population Survey

Income and Jobs

8.44. Table 8.7 provides the average income for residents of LBC, LBI and London as a whole.

Table 8.7: Jobs and Average Pay, 2011

	Camden	Islington	London
Median weekly pay (£)	690.5	673.4	610.2
Mean weekly pay (£)	940.7	916.6	768.0

Source: ONS Annual Survey of Hours and Earnings (ASHE)

8.45. The mean pay values for LBC, LBI and London as a whole are significantly higher than the median pay values as the mean is skewed by a small number of extremely high earners. This is typical for LBC, LBI and London as a whole but is especially prevalent with Inner London, and in particular these Boroughs given their proximity to the City of London.

8.46. As shown in Table 8.7, LBC and LBI have higher mean and median earnings than London as a whole. This is not unexpected as these Boroughs are within short commuting distance of highly paid jobs in the City of London and the West End.

8.47. Table 8.8 shows the number of jobs located within the Clerkenwell Ward and Holborn & Covent Garden Ward. The number of jobs in each ward and Borough is higher than the number of residents in employment because many people commute to these Boroughs from outer London and the south-east of England.

8.48. Holborn & Covent Garden Ward in particular have a high number of employees, with many of these in the retail, hotel and restaurant industries. The majority of these jobs are likely to be located some distance from the Site.

Table 8.8: Number of Employees (Nearest 100), 2011

	Holborn & Covent Garden	Camden	Clerkenwell	Islington	London
Part-time	22,900	70,900	6,200	37,000	1,134,700
Full-time	78,700	220,300	37,700	143,700	3,152,600
Total	**101,600**	**291,200**	**43,900**	**180,700**	**4,287,000**

Source: Business Register and Employment Survey (BRES)

Business Structure and Economic Activity

8.49. The average employees per business in LBC in 2011 was 12.2, with 291,200 employees and 24,000 registered businesses[32]. LBC has the third highest number of employees among all the London Boroughs, after Westminster and the City of London. LBI had an average of 17.6 employees per business in 2011, with 180,700 employees and 10,300 registered employers[33].

Deprivation

8.50. Significant areas of deprivation exist in both LBC and LBI. Of the 33 London Boroughs, LBC is ranked[34] as the 15th most deprived and LBI is ranked as the 5th most deprived.

8.51. Deprivation levels vary widely across Camden. The Holborn & Covent Garden Ward is about average for the Borough and slightly more deprived than the average for London. However, wards in LBI generally score highly on deprivation indices, all ranking among the most deprived third of wards in London. Clerkenwell is one of the two least deprived wards in the Borough, along with Highbury East, although it is still ranked as significantly more deprived than average for London.

Crime

8.52. Crime figures from the Metropolitan Police, as set out in Table 8.9 illustrate crime levels for LBC, LBI, Holborn & Covent Garden Ward and Clerkenwell Ward, together with equivalent figures for the entire area covered by the Metropolitan Police.

Table 8.9: Crime - Offences per 1,000 Population, January 2012 to December 2012

Offence	Holborn & Covent Garden	Camden	Clerkenwell	Islington	Metropolitan Total
Burglary	3.4	0.8	1.7	1.3	0.9
Criminal damage	1.5	1.0	0.9	0.7	0.7
Drugs offences	2.2	0.8	0.8	0.9	0.8
Fraud or Forgery	1.0	0.8	0.3	0.6	0.4
Robbery	0.9	0.6	0.2	0.3	0.4
Sexual offences	0.1	0.0	0.1	0.1	0.1
Theft and Handling	20.3	5.3	7.7	6.3	5.3
Violence	4.7	2.4	1.2	2.0	2.0
Other	0.2	0.0	0.1	0.1	0.1

Source: Metropolitan Police Crime Figures 2012-13

8.53. As illustrated in Table 8.9, the Holborn & Covent Garden Ward and Clerkenwell Ward have very high crime rates relative to the Boroughs and Metropolitan area as a whole. The Boroughs also have above average crime rates compared to the average for London. Much of the crime within these wards can be attributed to higher footfall due to shopping, tourism and nightlife elsewhere in the wards. For example, theft is very high in the Holborn & Covent Garden Ward, which is likely to be related to the large shopping areas within Covent Garden.

Education

Early Years' Education

8.54. In line with the DfE requirement for the universal (free) provision of early education for 3 and 4 year olds, all such children living in LBC and LBI are entitled to a funded early education place of 15 hours a week for 38 weeks a year. The most recent statistics from the DfE Early Years' Census[35] show that 4,830 pupils in LBC and 4,560 pupils in LBI were enrolled in some form of early years' education (private or state-funded providers) in January 2012. In LBI, 95.6% of these pupils benefitted from some free early years education, whilst in LBC, 80.7% of these pupils in early years education benefited from some free education, well below the Inner London average of 93.6%.

8.55. The Camden Childcare Sufficiency Assessment 2011 found that the supply of childcare in the Borough broadly meets the needs of parents who are working or undertaking activities which support employment. The Holborn & Covent Garden Ward was found to have 297 childcare places for 0 to 4 year olds representing 45 places for every 100 children in the ward. This compares with the LBC average of 39 places per 100 children.

8.56. The Islington Childcare Sufficiency Assessment 2011[36] found that supply of childcare places was most constrained in the younger age groups between 0 to 2 year olds but was largely sufficient for 3 to 4 year olds. There were however, some deficiencies in the supply of childcare during school holidays. The assessment found that Clerkenwell Ward has sufficient childcare provision given the relatively high level of vacancies and supply of childcare places.

Primary School Education

8.57. LBC has 41 state-funded primary schools and one primary level academy and similarly LBI has 42 state-funded primary schools and two primary level academies. The most recent statistics (School Census 2011) from the DfE[37] show that state funded schools in LBC and LBI have a total of 11,600 pupils and 14,177 pupils, respectively. The number of primary-age school children in LBC is predicted to increase by 6.7% between 2010/2011 and 2015/2016 (the latest projection years readily available), whilst the number of primary-age school children in LBI is predicted to increase by 11.7% between over the same period.

8.58. There are nine state-funded primary schools within 1km from the Site. In 2011 these schools had 2,425 places and 2,086 pupils, suggesting a surplus of 14% of total places. This exceeds the LBC and LBI averages where there are surpluses of 6.6% and 11.8% of total places relative to registered pupils.

8.59. In LBC, 87% of primary school age children attend primary school in the Borough. There is significant cross-border movement of pupils, and Westminster and LBI are the largest recipients of primary school aged pupils living in LBC; receiving 7% and 3% respectively. In LBI, 91% of primary school age children attend school in the Borough. Haringey and LBC are the largest recipients of primary school age children living in LBI; receiving 7% and 3% respectively.

Secondary School Education

8.60. There are currently ten state-funded secondary schools in LBI, including two academies[37]. According to the most recent DfE statistics from 2011, there are 9,891 places in state-funded secondary schools in LNI with 8,673 pupils on the role. Three schools have pupil numbers that exceed stated capacity and seven secondary schools have surplus places amounting to 1,431 places or 14.5% of total places. One of the schools with a deficit of capacity is located within 2km of the Site. Central Foundation Boys' School which is located 2km from the Site has 828 places and 894 pupils, with a deficit of 66 places.

8.61. LBC has nine state-funded secondary schools, which together had a combined 10,440 places and 9,708 pupils in 2011. All secondary schools located in LBC have some surplus places. LBC has a total of 732 surplus places; equivalent to 7% of total places.

8.62. The number of secondary school aged children living in LBC is predicted to increase by 2.5% between 2010/2011 and 2017/2018 (the latest projection years readily available). The number of secondary school aged children living in LBI is predicted to increase by 7.5% between 2010/2011 and 2017/2018[38].

8.63. The nearest secondary schools to the Site are Elizabeth Garrett Anderson School for Girls and the Central Foundation Boy's School located 1km and 2km from the Site, respectively. The most recent DfE statistics from 2011 indicate that Elizabeth Garrett Andersen School has a surplus of 469 places representing 36% of total places, although the Central Foundation Boys' School had a deficit of 131 places, representing 16% of total places in 2011.

8.64. Both LBC and LBI are net importers of pupils from surrounding Boroughs, although LBC has a far higher influx of pupils than other LPAs (15.6% of LBC pupil population) compared to LBI (1.5% of LBI pupil population). Westminster and LBI are the largest recipients of secondary school aged pupils living in LBC (10.2% and 9.4% of total respectively) and LBC is by far the most popular destination for secondary school aged pupils living in LBI (15.6%) followed by Haringey (4.3%)). LBI and LBC retain 67.7% and 73.1% respectively of secondary school aged pupils living in the Boroughs.

Private Education

8.65. LBC has a total of 27 independent schools; 19 primary schools, 3 secondary schools and 5 schools that provide education at both primary and secondary level. LBI has five independent schools, all of which are at primary level, which is the lowest number of independent schools of any Inner London borough with the exception of the City of London.

8.66. According to DfE statistics for 2011[37], independent schools located in LBC provide education for 8,678 pupils, whilst independent schools in LBI have a combined headcount of 860 pupils. There is no information available on the number of surplus places in independent schools or the extent of cross-border movement. However, it is assumed that cross-border movement of independent school pupils is similar or exceeds the rate for state-funded schools.

Health

8.67. In 2011, there were 40 General Practitioner (GP) practices in LBC and 38 GP practices in LBI[39], of which eight GP practices are located within approximately 1km of the Site. Only one practice located within 1km is not currently listed as accepting new patients according to the NHS Choices website[39].

8.68. The average GP list size in LBI in 2011 was 1,812 (equivalent to 53 GPs (full time equivalent) per 100,000 residents)[40], whereas the average GP list size in LBC was slightly lower at 1,628 (equivalent to 61 GPs per 100,000 residents). Across London as a whole, the average list size was 54 GPs per 100,000 residents. Therefore, the average GP list size in LBI is similar to the London average. The average GP list size in LBC is lower than the London average.

8.69. There are currently six dental practices located within 1km of the Site, 5 of which are listed as currently accepting new patients for NHS treatment without restriction on the NHS website. According to data from the NHS Information Centre for Health and Social Care[41], there are currently 1,471 people per NHS open contracted dentist in the Camden Primary Care Trust (PCT) area. There are 1,459 people per NHS contracted dentist in the Islington PCT area. This compares with 1,923 people per dentist in London Strategic Health Authority (SHA)[41]. There may however, be some double counting owing to dentists contracted in more than one PCT or SHA.

Open Space and Play Space

8.70. The Mount Pleasant SPD[11] acknowledges that there is a lack of public space in the immediate vicinity of the Site. Those public spaces that are available are identified as being of poor quality and have significant capacity for improvement. This supports the findings of the Islington Open Space, Sport and Recreation Study[42] which identified the Clerkenwell Ward as a priority area for increasing the quality and functionality of existing spaces.

8.71. The Camden Open Space, Sport and Recreation Study[43] shows that the central area (Holborn and Covent Garden, Kings Cross and Bloomsbury Wards) in which part of the Site is located has a total of 11.4 hectares (ha) of publically accessible open space. The Camden Open Space, Sport and Recreation Study found that the central area has 4m^2 of public open space per resident, which is in line with similar areas in Camden such as Kentish Town and Gospel Oak, although well below areas which incorporate the major parks of Hampstead Heath and Regents Park. Policy DP31 'Provision of, and improvements to, open space, sport and recreation' of LBC Development Policies sets a target of 9m^2 of publically accessible open space per resident. As a whole, LBC meets this target although many areas fall short.

8.72. The Islington Open Space, Sport and Recreation Study[44] proposes accessibility standards for the maximum distance a resident can be expected to travel for each type of open space. These

standards are predominantly based on Greater London Authority (GLA) open space standards. It is recommended that residents should have to travel no further than 1,200m to a strategic park or garden, 800m to a major park or garden and 400m to a small local park or neighbourhood square.

8.73. There are a number of public parks and green spaces within 400m (5 minutes' walk) of the Site. These include Wilmington Square, Spa Fields, Granville Square, St. Andrew's Gardens, Grays Inn Gardens and Coram's Fields. These green spaces have a combined area of 5.6ha. Spa Fields, Granville Square and Coram's Fields all provide children's playgrounds.

Community Facilities

8.74. Owing to its proximity to central London, the Site has a wide range of facilities within walking distance such as the Holborn Library located on Theobalds Road approximately 400m south-west from the Site, the Charles Dickens Museum (100m west of the Site), Foundling Museum (1km west of the Site) and the British Museum (1.5km to the south-west of the Site). The British Postal Museum and Archive will be located adjacent to the Site.

8.75. There are a wide range of leisure facilities in the local area. Finsbury Leisure Centre is supported by LBI and located approximately 1.4km east of the Site. The Finsbury Leisure Centre provides swimming and gym facilities, as well as a sports hall and outdoor floodlit pitches. Oasis Leisure Centre located 1.6km south-west of the Site on High Holborn is supported by LBC and provides a range of facilities including gym, swimming pool and squash courts. There are five private gyms within 1km from the Site including Vie Health Club on Clerkenwell Road and Nuffield Health on Mecklenburgh Place.

Retail

8.76. The Camden Retail Study 2008[45] appraised the vitality and viability of existing retail centres in LBC. The study assessed three central London retail centres located near the Site; High Holborn, Covent Garden (northern part) and Hatton Garden.

8.77. The northern part of the Covent Garden shopping area performs a specialist fashion retailing role and is located approximately 1.7km from the Site. This is a major shopping area and attracts visitors from all over the UK and abroad.

8.78. High Holborn shopping area principally serves the daytime weekday office workforce and has reduced visitor numbers in the evening and at weekends. The shopping area is located approximately 1.2km from the Site. The area has large numbers of Use Class A3 (restaurants and cafés) and convenience units providing for the daytime workforce as well as local residents.

8.79. Hatton Garden is a specialist retail area for jewellery as well as a neighbourhood retail centre serving the needs of the local residents and the local workforce. The area is located approximately 900m from the Site.

8.80. The Islington Retail Study[46] assessed the viability and future demand at retail centres in the Borough. The study found that the Borough has a healthy range of independent retailers and service businesses. Owing to the density, LBI is dependent on small and medium size foodstores. Existing foodstores are heavily overtrading and the scope for new large-scale foodstores is limited.

8.81. The study focuses on the main town centres in LBI. One of these is Angel Town Centre located 1.2km from the Site. The study found that there is strong demand from retailers for floorspace in Angel Town Centre and limited capacity to meet that demand. Once the Kings Cross

regeneration area is completed, it is likely to absorb future expenditure growth which would otherwise have gone to Angel Town Centre.

8.82. The study finds that Zone 11 (the southernmost study area in which the Site is located) has the highest level of retention of local resident expenditure on comparison and convenience goods in the Borough at 24% and 41% respectively.

Potential Effects

Demolition and Construction

Temporary Employment and Local Spend

Development Scenario 1

8.83. It is estimated that demolition and construction of Development Scenario 1 would be undertaken over a period of five years from the middle of 2015 to the middle of 2020. The demolition and construction phases of Development Scenario 1 would be expected to generate temporary employment. As shown in Table 8.10, 514 FTE direct jobs and 51 FTE indirect jobs are estimated at a local level and a further 257 FTE jobs created at a regional level. Due to the duration of Development Scenario 1 and the average number of construction jobs existing over a longer period, the sum of job creation in Development Scenario 2 and 3 does not correspond with Development Scenario 1.

8.84. It is considered that the demolition and construction employment associated with Development Scenario 1 would have a potential **temporary**, **beneficial effect** of **minor significance** at the **local** and **district levels** on employment opportunities.

8.85. Based on the temporary employment estimates for Development Scenario 1, local spend associated with the workforce is estimated at £373,000. This would provide a potential **temporary**, **beneficial effect** of **minor significance** at the **local level** on the economy.

Table 8.10: Estimated Demolition and Construction Jobs Created Per Year of Construction (FTEs)

	Development Scenario 1	Development Scenario 2	Development Scenario 3
Direct	514	344	480
Indirect (local)	51	34	48
Total (local)	**565**	**378**	**528**
Indirect (regional)	257	172	240
Total (regional)	**771**	**516**	**720**

Source: Volterra Estimates

Development Scenario 2

8.86. The demolition and construction works of the Development Scenario 2 would be expected to generate temporary employment. As shown in Table 8.10, 344 FTE direct jobs and 34 FTE indirect jobs are estimated at local level and a further 172 FTE jobs created at a regional level.

8.87. Local spend for Development Scenario 2 is estimated at £250,000, based on these employment estimates and the conditions outlined above.

8.88. It is considered that the demolition and construction employment associated with Development Scenario 2 would have a potential **temporary**, **beneficial effect** of **minor significance** at the **local** and **district levels** on employment opportunities.

8.89. Local spending in the local area by construction workers associated with Development Scenario 2 would provide a potential **temporary**, **beneficial effect** of **minor significance** at the **local level** on the economy.

Development Scenario 3

8.90. It is estimated that demolition and construction employment of Development Scenario 3 would generate 1,441 job-years or an average of 480 FTE jobs in each year of construction. Local spend for the development Scenario is estimated at £349,000 based on these employment estimates and the conditions outlined above.

8.91. It is considered that the demolition and construction employment associated with Development Scenario 3 would have a potential **temporary**, **beneficial effect** of **minor significance** at the **local** and **district levels** on employment opportunities.

8.92. Local spending in the local area by construction workers associated with Development Scenario 3 would provide a potential **temporary**, **local beneficial effect** of **minor significance** at the **local level** on the economy.

Completed Development

Population and Associated Local Spend

Development Scenario 1

8.93. It is estimated that Development Scenario 1 would accommodate a population of 1,202 residents, including 162 children, as shown in Table 8.11. This represents a 4.9% increase in the 2011 population of the Holborn & Covent Garden and Clerkenwell Wards.

Table 8.11: Estimated Population Yield of the Development Scenarios

	Development Scenario 1		Development Scenario 2		Development Scenario 3	
Unit Type	Population Yield	Child Yield	Population Yield	Child Yield	Population Yield	Child Yield
Studio	6	0	0	0	6	0
1 bed	201	7	97	3	104	4
2 bed	611	78	322	43	289	35
3 bed	289	56	97	16	192	40
4 bed	95	21	82	18	13	3
Total	**1,202**	**162**	**598**	**81**	**604**	**81**

Source: Volterra estimates using Islington HNA data

8.94. Using the average spend per person per week of £190 in Greater London[47] (not including mortgage repayments and rent) and assuming 1,202 residents living in the 681 residential units, the total additional spend attributed to the new population of Development Scenario 1 in London would be approximately £19.7 million per year. Additional spending in LBI and LBC would amount to £9.6 million per year.

8.95. The potential effect on the local economy of additional spending associated with Development Scenario 1 would be **long-term**, **beneficial** and of **minor significance** at the **district level** and **negligible** at the **regional level**.

Development Scenario 2

8.96. As shown in Table 8.11, it is estimated that the Development Scenario 2 would accommodate a resident population of 598, including 81 children, representing an increase in the 2011 population figures of 5.2% in Clerkenwell Ward.

8.97. The total additional spending attributed to the new population of the Development Scenario 2 in London would be approximately £9.8 million per year. Additional spending in LBI would amount to £4.8 million per year.

8.98. The potential effect on the local economy of additional spending associated with Development Scenario 2 would be **long-term**, **beneficial** and of **minor significance** at the **district level** and **negligible** at the **regional level**.

Development Scenario 3

8.99. It is estimated that the Development Scenario 3 would accommodate a resident population of 604, including 81 children (see Table 8.11), representing an increase of 4.6% in the 2011 population figures in Holborn & Covent Garden Ward.

8.100. The total additional spending attributed to the new population of the Development Scenario 3 in London would be approximately £9.9 million per year. Additional spending in LBC would amount to £4.8 million per year.

8.101. The potential effect on the local economy of additional spending associated with Development Scenario 3 would be **long-term**, **beneficial** and of **minor significance** at the **district level** and **negligible** at the **regional level**.

Housing

Development Scenario 1

8.102. Development Scenario 1 would provide 681 housing units representing 2% of the annual London target of 32,210 homes. The 132 affordable units (social and intermediate, the final total of which is subject to a viability assessment) represent 15% of the combined LBC and LBI annual affordable housing target (882 units) or 1% of the London affordable target of 13,200 homes per year.

8.103. The increase in market and affordable housing associated with Development Scenario 1 would have a potential **long-term**, **beneficial effect** of **moderate significance** at the **local** and **district levels** and **negligible** at the **regional level**.

Development Scenario 2

8.104. Development Scenario 2 would provide 336 residential units, which would represent 51% of the annual monitoring target for LBI of 665 units. The 66 affordable units (social and intermediate, the final total of which is subject to a viability assessment) proposed within Development Scenario 2 represents 33% of LBI's annual affordable housing target.

8.105. The increase in market and affordable housing associated with Development Scenario 2 would have a potential **long-term, beneficial effect** of **moderate significance** at the **local** and **district levels** and **negligible** at the **regional level**.

Development Scenario 3

8.106. The 345 residential units proposed within the Phoenix Place Development represent 30% of the annual monitoring target for LBC's of 1,170 units. The 66 affordable units (social and intermediate, the final total of which is subject to a viability assessment) represent 11% of LBC's annual affordable housing target.

8.107. The increase in market and affordable housing associated with Development Scenario 3 would have a **long-term**, **local** to **district beneficial effect** of **moderate** significance and **negligible** at the **regional level**.

Employment

8.108. The proposed Use Classes for each Development Scenario are listed in Table 8.12, together with the estimated local direct and indirect jobs (FTE) and the regional indirect jobs (FTE).

Table 8.12: Employment Floorspace within the Each Development Scenario

Development Scenario	Use Class	Proposed Floorspace (NIA m^2)	Density ratio (NIA m^2)[1]	Direct Jobs (FTE)	Local indirect jobs (FTE)	Regional indirect jobs (FTE)
Development Scenario 2 (Calthorpe Street Development)	A1, A2, A3, D1, D2	1,215	65	19	2	9
	A1, A2, A3	178	18	10	1	5
	B1	2,935	12	245	24	122
Development Scenario 3 (Phoenix Place Development)	A1, A2, A3	568	18	32	3	16
	A1, A2, A3, D1, D2	254	65	4	0	2
Development Scenario 1 (Entire Development)		**5,150**		**309**	**31**	**154**

8.109. Because the operations of the adjacent Mount Pleasant Sorting Office would remain, there would be no permanent loss of employment to the local area as a result of any of the Development Scenarios. Given existing employment in the Clerkenwell and Covent Garden and Holborn wards (43,900 and 101,600 respectively), the employment generated from each of the three Development Scenarios would have a limited effect on increasing local employment. However, the employment floorspace would create long-term employment opportunities for residents in the local area and the Boroughs.

Development Scenario 1

8.110. It is estimated that there would be 309 additional direct FTE jobs generated as a result of Development Scenario 1.

8.111. The commercial activity would have a positive effect on local businesses leading to indirect employment generation in the local area and in London. Using standard employment multipliers of 10% at the local level and 50% at the regional level21, Development Scenario 1 would generate an additional 31 indirect local jobs and 154 indirect jobs across London.

8.112. It is anticipated that the potential effect of Development Scenario 1 on employment would be **long-term**, beneficial and of **minor significance** at the **local** and **district levels** and **negligible** at the **regional level**.

8.113. The employees working within Development Scenario 1 would generate additional local spending. Assuming that 60% of the Development Scenario 1 workforce spends an average of £6 a day in the local area[2], it is estimated that local spending would increase by £245,000 per year (309 employees). It is therefore considered that the increase in local spending associated with the increase in employment associated with Development Scenario 1 would have a potential **beneficial effect** of **minor significance** at the **local level** and a **negligible effect** at the **district** and **regional levels**.

[1] In calculating the employment generation of flexible community and retail space, the lowest employment density ratio of the five use classes is used.
[2] Represents average discretionary spending per day and estimated leakage of expenditure from local area

Development Scenario 2

8.114. It is estimated that the Development Scenario 2 would generate an estimated 29 FTE direct jobs associated with the proposed flexible retail / community floorspace. It is estimated that the office floorspace would generate 245 direct FTE jobs assuming 100% occupancy.

8.115. Development Scenario 2 would generate an additional 27 indirect local jobs and 137 indirect jobs across London.

8.116. It is anticipated that the potential effect of Development Scenario 2 on employment would be **long-term**, **beneficial** and of **minor significance** at the **local** and **district levels** and **negligible** at the **regional level**.

8.117. It is estimated that local spending would increase by £217,000 per year for Development Scenario 2 (274 employees). The increase in local spending associated with the increase in employment generated by Development Scenario 2 would have a potential **beneficial effect** of **minor significance** at the **local level** and a **negligible effect** at the **district** and **regional levels**.

Development Scenario 3

8.118. It is estimated that 36 FTE jobs would be directly created from the proposed flexible retail and community floorspace. Development Scenario 3 would generate an additional 3 indirect local jobs and 18 indirect jobs in London. It is anticipated that the potential effect of Development Scenario 3 on employment would be **long-term**, **beneficial** and of **minor significance** at the **local level and negligible** at the district and **regional levels**.

8.119. Based on the creation of 36 FTE jobs, it is estimated that local spending would increase by £29,000 per year for Development Scenario 3. The increase in local spending associated with the increase in employment generated by Development Scenario 3 would have a **negligible effect** at the **local, district** and **regional levels**.

Retail

Development Scenarios 1, 2 and 3

8.120. The relevant retail planning policy and supporting evidence for LBI is contained in the emerging Development Management Policies, adopted Core Strategy (Policy CS14) and the Islington Retail Study[46]. Policy DM 21 from the Development Management Policies[5] states that applications from more than 80m^2 of Use Class A or D2 must demonstrate that *'the development would not individually, or cumulatively with other developments, have a detrimental impact on the vitality and viability of town centres within Islington or in adjacent boroughs'*.

8.121. The relevant retail planning policy and supporting evidence for LBC is contained in Core Strategy (Policy CS7) and the Camden Retail Study[45]. Policy CS7 of the Core Strategy states that LBC will support some retail provision in "*other town centres and Central London Frontages where* opportunities *emerge*". LBC states that it will also support "*limited provision of small shops outside centres to meet local needs*".

8.122. The Development Scenarios are not located within a designated town centre. The proposed retail provision within the Development Scenarios would likely be largely for use by the new residential community and employees, and therefore would be expected to compliment local shopping areas.

8.123. The emerging Finsbury Local Plan outlines a vision for the local area, including provision for a mix of employment uses such as offices, small and affordable workspaces, shops, cafés and restaurants.

8.124. It is therefore concluded that the retail floorspace proposed within any of the Development Scenarios would not have a significant effect on LBI's or LBC's designated town centres and / or other local retail frontages. The potential effect of each Development Scenario on existing retail outlets would therefore be **negligible**.

Crime, Safety and Wellbeing

Development Scenarios 1, 2 and 3

8.125. The Site and surrounding area has relatively high levels of crime owing to the density of shopping and employment activity in the two Boroughs, which are within, or lose to, the Central Activities Zone.

8.126. All the Development Scenarios would likely bring active management resulting in 24 hour activity, security and surveillance associated with the residential, community and retail uses. This would provide increased levels of natural surveillance over a longer period, reducing the potential for crime.

8.127. Each of the three Development Scenarios would have the potential to result in **long-term**, **local, beneficial effect** of **minor significance** in relation to reducing the potential for and perception of local crime, and the associated effects on safety and wellbeing.

Education

8.128. As reported in the baseline section, there is surplus of approximately 339 places for primary age children across 9 state funded primary schools within 1km of the Site. There are currently 2 secondary schools within 2km of the Site with a combined surplus of 238 places.

Table 8.13: Estimated Child Yield by Age

Child Yield	Development Scenario 1	Development Scenario 2	Development Scenario 3
0 - 4	98	46	52
5 - 10	45	24	21
11 - 15	19	11	8
Total	**162**	**81**	**81**

Source: Volterra estimates using Islington HNA data

Development Scenario 1

8.129. Owing to the proposed residential mix of Development Scenario 1, there would be a large proportion of young children within the resident population. As shown in Table 8.13, 98 children would be aged between 0 and 4 years old living in the Entire Development (Development Scenario 1). As with the case across London, a significant proportion of children may attend early years' education near their parents' place of work which could be in another London borough. By levels of demand in the Boroughs25 [&] 26, approximately 40 places would be required to cater for these children, providing that usage trends for the Entire Development mirror those currently experienced in the Boroughs.

8.130. In addition, the estimated 311 new employees associated with Development Scenario 1 would generate demand for childcare services. Although there are a number of vacant places at nearby childcare providers, the additional young children within the Entire Development are expected to increase the demand on local childcare and early years' services. It is therefore considered that

the potential effect would be **adverse** and of **moderate significance** at the **local level** and **negligible** at the **district** and **regional levels**.

8.131. It is estimated that there would be 46 children aged 0 to 4 living at the completed Entire Development (Development Scenario 1). On this basis, it is considered that there is adequate provision of primary school places within the local area and thus the likely effect of Development Scenario 1 on primary education would be **negligible** at the **local, district** and **regional** levels.

8.132. Across LBI and LBC there are in excess of 2,000 surplus secondary school places. Since the estimated population of secondary school aged children associated with the Entire Development is estimated to be 19. As such, the potential effect of Development Scenario 1 on the secondary school provision would be **negligible** at the **local, district** and **regional levels**.

Development Scenario 2

8.133. As presented in Table 8.13, it is estimated that there would be 46 children aged 0 to 4 living at the completed Calthorpe Street Development (Development Scenario 2). It is considered that the potential effect of Development Scenario 2 on the provision of childcare services would be adverse and of **minor significance** at the **local level** and **negligible** at the **district** and **regional levels**.

8.134. It is estimated that there would be 24 children of primary school age living at the completed Calthorpe Street Development (Development Scenario 2). It is considered that there is adequate provision of primary school places within the local area and thus the likely effect of Development Scenario 2 on primary education would be **negligible** at the **local, district** and **regional levels**.

8.135. There are in excess of 1,431 surplus secondary school places in Islington borough. The number of secondary school aged children associated with the Development Scenario 2 is estimated to be 11. As such, the potential effect of Development Scenario 2 on the secondary school provision would be **negligible** at the **local, district** and **regional levels**.

Development Scenario 3

8.136. It is estimated that there would be 52 children aged 0 to 4 living at the completed Phoenix Place Development (Development Scenario 3). It is considered that the potential effect of Development Scenario 3 on the provision of childcare services would be of **minor adverse significance** at the **local level** and **negligible** at the **district and regional levels**.

8.137. It is estimated that there would be 21 children of primary school age living at the completed Phoenix Place Development (Development Scenario 3). It is considered that there is adequate provision of primary school places within the local area and thus the likely effect of Development Scenario 3 on primary education would be **negligible** at the **local, district** and **regional levels**.

8.138. There are in excess of 732 surplus secondary school places in the LBC. The number of secondary school aged children associated with the Development Scenario 2 is estimated to be 8. As such, the potential effect of Development Scenario 2 on the secondary school provision would be **negligible** at the **local, district** and **regional levels**.

Health

Development Scenarios 1, 2 and 3

8.139. Of the 8 GP surgeries within 1km of the Site, 7 are accepting new patients according to the NHS Choices website[39]. However, given the estimated population of Development Scenario 1 (1,202 persons), an additional 0.7 GPs would be required to maintain current levels of GPs relative to patients in local area. However, this assumes that the population of the Entire Development moves from outside the local area. Existing residents of the local area moving to new accommodation at the Development Scenarios would not place an additional demand on the provision of GP services.

8.140. The estimated population of 598 people associated with Development Scenario 2 would generate demand for an additional 0.33 GPs in LBI based on average list sizes set out in the baseline section of this Chapter. The estimated population of 604 people associated with Development Scenario 3 would generate demand for an additional 0.37 GPs in LBC based on current average list sizes.

8.141. Based on the size of the projected population of each Development Scenario, it is considered that the new residents would place additional demand on GP services. It is therefore considered that the potential effects of each of the Development Scenarios would be **long-term**, **adverse** and of **minor significance** at the **local level** and **negligible** at the **district** and **regional levels**.

8.142. At present, dental provision in the local area is significantly more generous than the rest of London, suggesting there is adequate provision for new patients while maintaining a reasonable standard of service. Therefore, together with the estimated population of each Development Scenario, the potential effect of all three Development Scenarios on dental care would be **negligible** at the **local**, **district** and **regional levels**.

Leisure and Community Facilities

Development Scenarios 1, 2 and 3

8.143. Given their central location, residents of each of the three Development Scenarios would have good access to the large range of leisure facilities on offer in the Central Activities Zone. In addition, a number of leisure and community facilities are located in the vicinity of the Site (within 2km).

8.144. The Calthorpe Street Development (Development Scenario 2) provides 1,393m^2 flexible retail and community space. The Phoenix Place Development (Development Scenario 3) provides 254m^2 flexible retail and community space. The floorspace has the potential to accommodate a range of activities including a community or leisure facilities which can be adapted to the requirements of the residents of each Development Scenario.

8.145. The additional population associated with any of the three Development Scenarios would have a potential **negligible effect** on the provision of local community and leisure facilities.

Open Space and Play Space

8.146. In terms of the minimum required provision of play space, LBI sets its own minimum play space standard of 5 sq. m per child. LBC defers to the Greater London Authority (GLA) guidance with a minimum requirement of 10 sq. m per child. As such, we provide estimated play space requirements for Development Scenario 1 according to GLA guidance, Development Scenario 2 (Calthorpe Street) according to Islington guidance and Development Scenario 3 according to GLA guidance.

Table 8.12: Open Space and Play Space Requirements within the Each Development Scenario

Development Scenario	Estimated Children (using GLA child yield estimates)	Estimated Children (using Islington child yield estimates)	Minimum required play space provision (GLA guidance)	Minimum required play space provision (Islington Borough Council)
Development Scenario 1 (Entire Development)	216		2,160m^2	
Development Scenario 2 (Calthorpe Street Development)		81		405m^2
Development Scenario 3 (Phoenix Place Development)	112		1,120m^2	

Development Scenario 1

8.147. Based on GLA child yield estimates, there would be 216 children living within both the Calthorpe Street Development and the Phoenix Place Development. Applying GLA guidance, the minimum requirement for play space provision would be 2,160m^2.

8.148. The Entire Development (the two developments combined) would provide a total of 4,120m^2 of child play space. The total amount of public open realm space provided in Development Scenario 1 would be 6,944m^2.

Development Scenario 2

8.149. Based on the estimated 81 children living at the Calthorpe Street Development and child yield data from the Islington Housing Needs Assessment, the minimum required play space provision for the Calthorpe Street site would be 405m^2.

8.150. As set out in the Play Space Strategy prepared by Publica, the Calthorpe Street Development would provide approximately 1,100m^2 of play space for 0 to 4 year olds, 1,350m^2 for 5 to 11 year olds and 300m^2 for 12+ year olds. The Calthorpe Street Development would create 5,124m^2 public open realm space accessible to the general public and residents of the Calthorpe Street Development. Private amenity space accessible to residents would also be provided within the Calthorpe Street Development in the form of balconies and winter gardens. Private roof terraces accessible to individual residential units would be provided at different levels within Buildings E, F, H and K.

Development Scenario 3

8.151. Based on GLA guidance and using GLA child yield estimates, there would be an estimated 112 children living at the Phoenix Place Development. GLA guidance of 10 sq m per child implies a minimum required play space provision of 1,120m^2.

8.152. The Phoenix Place Development would provide 1,120m^2 dedicated play spaces for 0 to 11 year olds and 250m^2 youth space for 12+ year olds. The Phoenix Place Development would also provide 1,820m^2 of public open realm accessible to the general public and residents of the Phoenix Place Development.

8.153. The proposed area of play space for Development Scenarios 1, 2 and 3 match or exceed the minimum required provision. It is considered that the play space provision within each Development Scenario would have a potential **long-term beneficial effect** of **minor significance** at the **local level** and **negligible** at the **district** and **regional levels**.

8.154. The publically accessible open realm within Development Scenarios 1, 2 and 3 would benefit the local community as well as the Development Scenarios' residents. It is considered that the open space provision within each Development Scenario would have a potential **long-term beneficial effect** of **minor significance** at the **local level** and **negligible** at the **district** and **regional levels**.

Mitigation Measures

Demolition and Construction

8.155. During the demolition and construction phases of any of the Development Scenarios, employment and spending would be generated, resulting in beneficial effects. Therefore, no mitigation would be required. There may, however, be opportunities to maximise the beneficial effects from the construction phase through the implementation of local employment or training initiatives.

Completed Development

8.156. The Development Scenarios 1, 2 and 3, once completed and operational, would result in negligible or beneficial effects in relation to local spend, housing supply, employment, crime, primary and secondary school education, dental provision, leisure and community facilities and retail provision. As such, no mitigation would be required.

8.157. All the Development Scenarios are considered to have adverse effects on provision for early years' education (0 to 4 year olds) and on local GPs surgeries, owing to the additional demand on these services. These effects would be mitigated through contributions under a Section 106 Agreement, which would be used to increase and improve provision in order to maintain or enhance current standards.

Likely Residual Effects

8.158. Owing to the fact that no mitigation would be required for any of the identified potential demolition and construction effects of Development Scenarios 1, 2 and 3, the likely residual effects would be:

- Demolition and construction employment - **temporary**, **local** to **district beneficial effect** of **minor significance**; and
- Demolition and construction related local spend - **temporary**, **local**, **beneficial effect** of **minor significance**.

Completed Development

8.159. The likely residual effects of Development Scenario 1, 2 and 3 (assuming mitigation, where identified above) unless otherwise stated would be as follows:

- The additional local population arising from the Development - **negligible**;
- Local spend resulting from the occupants of the Development - **long-term**, **local** to **district beneficial effect** of **minor significance**;
- The provision of new homes - **long-term, local** to **district beneficial effect** of **moderate significance**;
- Net employment gain when considered against other related factors - **long-term, local** to **district beneficial effect** of **minor significance** for Development Scenarios 1 and 2, **negligible effect** for Development Scenario 3;
- Effect of retail floorspace on designated Town Centres or other local retail frontages – **negligible**;
- Local crime, safety and wellbeing - **long-term, local beneficial effect** of **minor significance**;
- Effects upon the supply and demand for primary and secondary services - **negligible**;
- Effects upon the supply and demand for dental services - **negligible**;
- Effect of provision of open space and play space – **long-term, local beneficial effect** of **minor significance**;
- Effects on the supply and demand for early years education- **negligible**; and
- Effects upon the supply and demand for GP services- **negligible**.

Conclusion

8.160. A summary of the potential socio-economic effects of the three Development Scenarios, together with the necessary mitigation measures, and the likely residual effects are summarised in Table 8.14.

Table 8.14: Summary of Potential and Likely Residual Effects

Description of Effect	Potential Effect	Mitigation	Likely Residual Effect
Demolition and Construction			
Development Scenario 1			
Estimated generation of 514 temporary construction jobs per year over the 63 month demolition and construction works	Temporary, short to medium-term, local to district effect of **minor beneficial** significance	None required	Temporary, short to medium-term, local to district effect of **minor beneficial** significance
Estimated contribution of £373,000 of demolition and construction workforce local spend per year	Temporary, short to medium-term, local effect of **minor beneficial** significance	None required	Temporary, short to medium-term, local effect of **minor beneficial** significance
Development Scenario 2			
Estimated generation of 344 temporary construction jobs per year over the 54 month demolition and construction works	Temporary, short to medium-term, local to district effect of **minor beneficial** significance	None required	Temporary, short to medium-term, local to district effect of **minor beneficial** significance
Estimated contribution of £250,000 of demolition and construction workforce local spend per year	Temporary, short to medium-term, local effect of **minor beneficial** significance	None required	Temporary, short to medium-term, local effect of **minor beneficial** significance
Development Scenario 3			
Estimated generation of 480 temporary construction jobs per year over the 36 month demolition and construction works	Temporary, short to medium-term, local to district effect of **minor beneficial** significance	None required	Temporary, short to medium-term, local to district effect of **minor beneficial** significance
Estimated contribution of £349,000 of demolition and construction workforce local spend per year	Temporary, short to medium-term, local effect of **minor beneficial** significance	None required	Temporary, short to medium-term, local effect of **minor beneficial** significance
Completed Development			
Development Scenario 1			
Generation of an estimated £9.6m and £19.7m of household spending from the new residents at the district and regional levels respectively	Long-term, local to district effect of **minor beneficial**	None required	Long-term, local to regional effect of **minor beneficial** significance and **negligible** at the regional level

Description of Effect	Potential Effect	Mitigation	Likely Residual Effect
	significance and **negligible** at the regional level		
Provision of 681 new residential units	Long-term, local to district effect of **moderate beneficial** significance	None required	Long-term, local to district effect of **moderate beneficial** significance
309 jobs created at the Site	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level	None required	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level
Generation of an additional £245,000 in local spending per year due to the increase in employment at the Site	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level	None required	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level
Effect of new retail provision on designated Town Centres or other local retail frontages	**Negligible**	None required	**Negligible**
Reduction in opportunities for crime and associated effects upon safety and wellbeing	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Increased pressure on early years education provision	Long-term, local effect of **moderate adverse** significance	Mitigation via Section 106 contribution	**Negligible**
Increased pressure on Primary and secondary school education provision	**Negligible**	None required	**Negligible**
Increased pressure on GP services	Long-term, local effect of **minor adverse** significance	Mitigation via Section 106 contribution	**Negligible**
Increased pressure on dental services	**Negligible**	None required	**Negligible**
Increased pressure on leisure and community	**Negligible**	None required	**Negligible**

Description of Effect	Potential Effect	Mitigation	Likely Residual Effect
facilities			
Increased pressure on open space provision	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Play space provision for children under 12 years of age	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Play space provision for children over 12 years of age	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Development Scenario 2			
Generation of an estimated £4.8m and £9.8m of household spending from the new residents at the district and regional levels respectively	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level	None required	Long-term, local to regional effect of **minor beneficial** significance and **negligible** at the regional level
Provision of 336 new residential units	Long-term, local to district effect of **moderate beneficial** significance	None required	Long-term, local to district effect of **moderate beneficial** significance
273 jobs created at the Site	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level	None required	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level
Generation of an additional £216,000 in local spending per year due to the increase in employment at the Site	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level	None required	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level
Effect of new retail provision on designated Town Centres or other local retail frontages	**Negligible**	None required	**Negligible**
Reduction in opportunities for crime and associated effects upon safety and wellbeing	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance

Description of Effect	Potential Effect	Mitigation	Likely Residual Effect
Increased pressure on early years education provision	Long-term, local effect of **minor adverse** significance	Mitigation via Section 106 contribution	**Negligible**
Increased pressure on primary and secondary school education provision	**Negligible**	None required	**Negligible**
Increased pressure on GP services	Long-term, local effect of **minor adverse** significance	Mitigation via Section 106 contribution	**Negligible**
Increased pressure on dental services	**Negligible**	None required	**Negligible**
Increased pressure on leisure and community facilities	**Negligible**	None required	**Negligible**
Increased pressure on open space provision	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Play space provision for children under 12 years of age	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Play space provision for children over 12 years of age	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Development Scenario 3			
Generation of an estimated £4.8m and £9.9m of household spending from the new residents at the district and regional levels respectively	Long-term, local to district effect of **minor beneficial** significance and **negligible** at the regional level	None required	Long-term, local to regional effect of **minor beneficial** significance and **negligible** at the regional level
Provision of 345 new residential units	Long-term, local to district effect of **moderate beneficial** significance	None required	Long-term, local to district effect of **moderate beneficial** significance
Generation of an additional £29,000 in local spending per year due to the increase in employment at the	**Negligible**	None required	**Negligible**

Description of Effect	Potential Effect	Mitigation	Likely Residual Effect
Site			
36 jobs created at the Site	Long-term, local effect of **minor beneficial** significance and **negligible** at the district and regional levels	None required	Long-term, local effect of **minor beneficial** significance and **negligible** at the district and regional levels
Effect of new retail provision on designated Town Centres or other local retail frontages	**Negligible**	None required	**Negligible**
Reduction in opportunities for crime and associated effects upon safety and wellbeing	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Increased pressure on early years education provision	Long-term, local effect of **minor adverse** significance	Mitigation via Section 106 contribution	**Negligible**
Increased pressure on Primary and secondary school education provision	**Negligible**	None required	**Negligible**
Increased pressure on GP services	Long-term, local effect of **minor adverse** significance	Mitigation via Section 106 contribution	**Negligible**
Increased pressure on dental services	**Negligible**	None required	**Negligible**
Increased pressure on leisure and community facilities	**Negligible**	None required	**Negligible**
Increased pressure on open space provision	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Play space provision for children under 12 years of age	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance
Play space provision for children over 12 years of age	Long-term, local effect of **minor beneficial** significance	None required	Long-term, local effect of **minor beneficial** significance

References

1 Department for Communities and Local Government, 2012, 'National Planning Policy Framework'. DCLG, London.
2 Greater London Authority, 2011, 'The London Plan', GLA, London.
3 Greater London Authority, 'Shaping Neighbourhoods: Play and Informal Recreation Supplementary Planning Guidance', GLA, London.
4 Greater London Authority, 2012, 'The London Plan – Revised Early Minor Alterations', GLA, London.
5 London Borough of Islington, 2012, 'Islington Development Policies submission', LBI, London.
6 London Borough of Islington, 2012, 'Islington Site Allocations Submission', LBI, London.
7 London Borough of Islington, 2012, 'draft Finsbury Local Plan', LBI, London.
8 London Borough of Islington, 2011, Islington Core Strategy', LBI, London.
9 London Borough of Islington, 2002, 'Unitary Development Plan', LBI, London.
10 London Borough of Camden, 2012, 'Camden Site Allocations Submission', LBC, London.
11 London Boroughs of Camden and Islington, 2012, 'Mount Pleasant – Supplementary Planning Document', LBC and LBI, London.
12 London Borough of Camden, 2010, 'Camden Core Strategy', LBC, London.
13 London Borough of Camden, 2010, Camden Development Policies Adopted Version', LBC, London.
14 Greater London Authority, September 2012, 'Shaping Neighbourhoods Play and Informal Recreation', GLA, London.
15 Office for National Statistics, 2012, 'National Census 2011', ONS
16 Office for National Statistics, 2012, 'Annual Population Survey', ONS
17 Office for National Statistics, 2012, 'Annual Survey of Hours and Earnings', ONS
18 Office for National Statistics, 2012, 'Regional Gross Value Added', ONS.
19 Office for National Statistics, 2012, 'Workforce Jobs by Region', ONS.
20 Drivers Jonas Deloitte, 2010, 'Employment Densities Guide: 2nd Edition', Department for Communities and Local Government, London.
21 English Partnerships, 2008, 'Additionality Guide, 3rd Edition', English Partnerships.
22 Fordham Research, 2008, 'London Borough of Islington Local Housing Needs Assessment', LBI, London.
23 Fordham Research, 2008, 'London Borough of Camden Housing Needs Survey Update 2008', LBC, London.
24 Office for National Statistics, 2011, 'Family Spending 2011', ONS.
25 London Borough of Islington, 'Childcare Sufficiency Assessment 2011', LBI, London.
26 London Borough of Camden, 'Camden Childcare Sufficiency Assessment 2011', LBC, London.
27 London Metropolitan Police, 'London Crime Figures – borough 2012-13', London Metropolitan Police, London.
28 Department for Communities and Local Government, 'The English Indices of Deprivation 2010', DGLG, London.
29 Office for National Statistics, 2011, 'Annual Population Survey', ONS.
30 London Borough of Camden, 2011, 'Camden's Housing Strategy 2011-2016', LBC, London.
31 London Borough of Islington, 2008, 'Local Housing Needs Assessment', LBI, London.
32 London Borough of Camden, 2012, 'Camden Business and Employment Bulletin', LBC, London.
33 London Borough of Islington, 2011, 'Islington Local Economic Assessment', LBI, London.
34 Department for Communities and Local Government, 2012, '2010 Indices of Multiple Deprivation', DCLG, London.
35 Department for Education, 2012, *'Early Years Census 2012'*. DfE, London.
36 London Borough of Islington, 2011, '*Islington Childcare Sufficiency Assessment',*LBI, London.
37 Department for Education*, 2012, 'National School Census 2012'.* DfE*, London.*
38 Department for Education, 2012, *'School Capacity; 2010/11'*, DfE, London.
39 www.nhs.uk
40 *ICHSC, 2012, IC Indicator Portal, https://indicators.ic.nhs.uk/webview/, NHS.*
41 *ICHSC, 2012, 'NHS Dental Statistics for England. 2011/12, Annex 2', NHS*
42 Land Use Consultants/ PMP, 2009 *'Open Space, Sport and Recreation Assessment',* LBI, London.
43 Atkins, 2008, *'Open Space, Sport and Recreation Study Update', LBC, London.*

44 Land Use Consultants / PMP, 2009, ‘Open Space, Sport and Recreation Assessment’, LBI, London.
45 Roger Tym and Partners, 2008, ‘Camden Retail Study’, Roger Tym and Partners, London.
46 DTZ, 2008, ‘Islington Retail Study Update’, DTZ, London.
47 Office for National Statistics, 2011, ‘Family Spending 2011 Edition’, ONS.

9. Transportation and Access

Introduction

9.1. This Chapter, which was written by SKM Colin Buchanan, provides a summary of the Transport Assessment (TA) prepared in support of the planning applications. The TA is included as Appendix 9.1.

9.2. This Chapter describes the assumed transportation and access-related future baseline conditions on and in the vicinity of the Site, together with the assessment methodology used to forecast the trip generation associated with each of Development Scenario. The likely significant direct and indirect effects of each Development Scenario are identified in relation to a variety of transport modes, followed by any necessary mitigation measures required to prevent, reduce or offset potential adverse effects arising from the Development Scenarios. Finally, the nature and significance of the likely residual effects of each of the Development Scenarios taking into account the mitigation measures are described.

Legislation, Planning Policy and Guidance

National Planning Policy

National Planning Policy Framework, 2012

9.3. The National Planning Policy Framework[1] (NPPF) sets out national planning policies for England. It supersedes and replaces almost all previous national Planning Policy Statements (PPS) and Planning Policy Guidance notes (PPG), including PPG13 Transport[2]. Policy in relation to Transport is set out within Chapter 4, Paragraphs 29 to 41 of the NPPF.

9.4. Paragraph 32 of the NPPF notes that all developments that generate significant amounts of movement should be accompanied by a Transport Statement or TA and that plans and decisions should take account of whether:

- *"The opportunities for sustainable transport modes have been taken up depending on the nature and location of the site, to reduce the need for major transport infrastructure*
- *Safe and suitable access to the site can be achieved for all people*
- *Improvements can be undertaken within the transport network that are cost effective and limit the significant effects of the development. Development should only be prevented or refused on transport grounds where the residual cumulative effects of development are severe."*

9.5. Similarly, Paragraph 34 notes "*Plans and decisions should ensure developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.*"

9.6. Paragraph 35 discusses the design of development noting that, where practical, developments should:

- "*Accommodate the efficient delivery of goods and supplies;*
- *Give priority to pedestrian and cycle movements, and have access to high quality public transport facilities;*
- *Create safe and secure layouts which minimise conflicts between traffic and cyclists or pedestrians;*
- *Avoiding street clutter;*

- *Incorporate facilities for charging plug-in and other ultra-low emission vehicles; and*
- *Consider the needs of people with disabilities by for all modes of transport*".

Regional Planning Policy

The London Plan: Spatial Development Strategy of Greater London, 2011

9.7. Chapter 6 of the adopted London Plan[3] relates to the improvement of London's accessibility. The main transport objective is to "*make London a city where it is easy, safe and convenient for everyone to access jobs, opportunities and facilities with an efficient and effective transport system which actively encourages more walking and cycling*." The key relevant strategic policy directions for achieving this objective are to:

- Encourage patterns and nodes of development that reduce the need to travel, especially by car;
- Seek to improve the capacity and accessibility of public transport, walking and cycling, particularly in areas of greater demand;
- Support development that generates high levels of trips at locations with high public transport accessibility;
- Improve interchange between different forms of transport;
- Support measures that encourage shifts to more sustainable modes and appropriate demand management; and
- Promote walking by ensuring an improved urban realm.

9.8. On assessing the transport-related effects of development, Policy 6.3 of the London Plan states that:

- Development proposals should ensure that effects on transport capacity are fully assessed;
- TA's will be required in accordance with Transport for London's (TfL) Transport Assessment Best Practice Guidance for major planning applications; and
- Residential and workplace Travel Plans should be provided, defined by TfL standards.

9.9. On cycling, Policy 6.9 of the London Plan states that developments should "*Provide secure, integrated and accessible cycle parking facilities in line with the minimum standards for cycle parking*".

Revised Early Minor Alterations to the London Plan, 2012

9.10. In June 2012, the London Plan Revised Early Minor Alterations[4] was published for public consultation in order to establish consistency with the NPPF.

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

9.11. Chapter 8 of the London Borough of Islington's (LBI's) Development Management Policies Submission document[5] provides further details on transport policy, and in particular helps implement the transport policies which are set out in the Core Strategy. Policy DM45 states that new developments should prioritise the transport needs of pedestrians, public transport users and cyclists above those of motor vehicles. Policy DM46 goes on to states that development proposals are required to meet the transport needs of the development, and also address the transport impacts in a sustainable manner.

9.12. Furthermore, in order for developments to be considered acceptable by the LBI, they are required to:

- Fully mitigate any adverse impacts on the capacity of the transport infrastructure;
- Have no negative impacts on the safe and efficient operation of transport infrastructure;
- Maximise safe, convenient and inclusive accessibility to, from and within developments for pedestrians, cyclists and public transport users, and adequately address delivery, servicing and drop-off requirements; and
- Developments are also required to include the submission of either a Transport Assessment and Travel Plan, and also a Construction Logistics Plan and Delivery and Servicing Plan which would all describe how impacts will be mitigated.

9.13. Policy DM48 outlines that where any public realm works are required as part of a development proposals, these shall be undertaken to best practice standards and meet the objectives within Islington's Streetbook SPD[6]. Furthermore any major development proposals are required to contribute financially to strategic improvements to walking and cycling infrastructure, including the Borough's cycle network. Major developments are also required to provide cycle parking. It should also be demonstrated that there are no road safety conflicts between pedestrians, cyclists and vehicles entering, parking and servicing a development.

9.14. Policy DM49 focuses on parking and in particular states that in line with the Core Strategy all additional homes shall be car free. Unless exceptional circumstances can be demonstrated no parking permits will be issued to occupiers of these new homes. Furthermore parking will only be allowed for non-residential developments where this is essential of operational requirements. It also states that the major residential developments will be required to contribute towards the provision of car clubs in the vicinity of the development, either through CIL and/ or Section 106 agreements.

9.15. Finally Policy DM50 deals with delivery and servicing for new developments and suggests that these should be provided off-street. It also states that it must be demonstrated that servicing vehicles can enter and exit the site in forward gear. Details will also need to be submitted outlining the delivery and servicing needs of new developments. All bays are required to be strictly controlled and clearly signed. Furthermore, for major development details of refuse and recycling must also be submitted.

London Borough of Islington's Site Allocations Submission, 2012

9.16. The final Submission document[7] was submitted to the Planning Inspectorate on 16 August 2012. It will now be examined by an independent Planning Inspector. This document provides further details on sites in Islington however, it does not provide any details on the Mount Pleasant site, as this is contained in the Finsbury Local Plan Submission

London Borough of Islington's Finsbury Local Plan Submission, 2012

9.17. Referred to in previous consultations as the Bunhill and Clerkenwell Area Action Plan, the document is now being taken forward as the Finsbury Local Plan[8], reflecting the establishment of the council's new Finsbury Ward Partnership.

9.18. The document states that for the Mount Pleasant Sorting Office, the following should be provided by the development proposals:

- A masterplan that links the Camden and Islington parts of the site as an integrated scheme;

- A high quality public realm surrounding and throughout the site which blends seamlessly with the wider public realm and provide new fully accessible public spaces, cycle parking and cycle hire facilities;
- Pedestrian priority routes that connect major pedestrian routes in the wider areas;
- Delivery and service vehicle access accommodated in a manner that minimises the impact of traffic movement on the wider area; and
- Public realm improvements which facilitate walking and cycling throughout the area, and which restrict vehicular movements where necessary to promote pedestrian activity.

London Borough of Islington's Core Strategy, 2011

9.19. The LBI's Core Strategy[9] was adopted in 2011 and informs planning decisions and shapes development in the Borough up to 2025.

9.20. In transport terms, the Objective 1 of the Core Strategy encourages walking and cycling over public transport use and encourages all these modes over car use. Objective 1 also aims to improve transport connections to ensure that public transport capacity is sufficient to meet the needs of those who live, work and study in the Borough and that capacity is also sufficient to allow access to work, study and leisure opportunities. Objective 17 promotes sustainable transport choices to mitigate the effect of developments on the environment and to respond to congestion affecting local roads.

9.21. On sustainable travel, Policy CS2 states that the LBI will:

- Require new developments which generate large numbers of trips to be located in town centres and other highly accessible locations;
- Only allow for essential parking needs in new development;
- Require new housing in locations well served by public transport to be car free;
- Improve provision for walking and cycling; and
- Work with TfL and other partners to improve public transport.

London Borough of Islington Unitary Development Plan (Saved Policies 2011)

9.22. With regards to new developments which generate traffic, saved Policy T56 of the LBI Unitary Development Plan[10] (UDP) states that "*the proposals will be assessed for their contribution to traffic generation, their impact on congestion and the present and potential availability of public transport and its capacity to meet increased demand*".

9.23. LBI's saved UDP Policy T8 'Greater London Road Network' seeks to meet their traffic reduction targets by promoting measures to increase the proportion of road space allocated to public transport, cyclists and pedestrians.

9.24. Saved Policy T18 'Parking and Traffic Restraint' states that the LBI will discourage private car journeys which are not essential and which could reasonably be made by public transport, walking or cycling.

9.25. To reconcile traffic restraint, saved Policy T19 'Hierarchy of Parking Need' prioritises disabled parking, goods / services provision and local resident parking when considering parking need.

9.26. Policy T29 'On-Street Parking' states that the LBI will extend parking restrictions and controlled parking zones, where necessary, to areas where parking demand exceeds the safe capacity of the streets.

9.27. The needs of cyclists are prominent throughout the UDP and in particular, the provision of adequate, secure and safe parking for bicycles at all development. Saved Policy T34 'Cycle Parking' states that the provision of parking is set out in the LBI's Planning Standards Guidelines[11].

9.28. Saved Policies T55 and T56 'New Development' seek to ensure that development is:

- Properly related to the Borough's public transport network; and,
- Meets the Council's standards in terms of parking, servicing and highway access.

9.29. Saved Policy T32 'On-Street Servicing' states that the "*The Council will seek ways of eliminating on-street servicing particularly on bus lanes, by promoting access arrangements where possible*."

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

9.30. The Phoenix Place site is allocated within this document for *'a mixed use development, primarily residential, which could include other uses such as business , community and retail uses, which makes efficient use of this highly accessible Central London location and also helps to meets the operational needs of Royal Mail '*

Mount Pleasant Supplementary Planning Document, 2012

9.31. The Mount Pleasant Supplementary Planning Document[12] (SPD) forms part of both LBI's and LBC's Local Development Frameworks (LDF). The SPD sets out policies that should be addressed by the redevelopment of the Site and provides development guidelines.

9.32. The SPD states that "*any future development of the Mount Pleasant site is intended to be predominantly car free and that new residential parking will be limited to disabled parking, servicing and delivery access only*".

9.33. On the production of a TA, the SPD states:

- *"A Transport Assessment / Statement is required to assess the impact of any future development proposal for the planning brief area on transport infrastructure, including the capacity of roads, public transport and walking and cycling infrastructure, and detail action to manage this impact.*
- *It should present qualitative and quantitative information about the anticipated transport and related environmental impacts before, during and after implementation of the proposed development, including details of the accessibility of the site by all transport modes and all users, including disabled people, and the likely modal split of journeys to and from the site.*
- *A Servicing and Delivery Plan (detailing access and delivery arrangements), cross referenced to the Transport Assessment / Statement (if separate), should describe how any impacts arising from servicing the proposed development would be minimised. In line with Islington UDP Policy T32, servicing and deliveries should be provided for on-site if possible.*
- *The Travel Plans / Statements, cross referenced to the Transport Assessment / Statement (if separate), for any future development of the planning brief area should be prepared in accordance with Islington's Sustainable Transport Planning Guidance Note and submitted with any planning application. When adopted, the transport section of the emerging Islington Development Management Policies will supersede the Islington Sustainable Transport Planning Guidance Note."*

Guidance

London Borough of Islington's Environmental Design Planning Document, 2012

9.34. LBI's Environmental Design SPD[13] provides guidance on how the LBI's current planning policies relating to sustainable design will be applied to development proposals. Sustainable transport issues are not mentioned in much detail within this guidance.

London Borough of Islington Streetbook Supplementary Planning Document, 2012

9.35. LBI prepared a Streetbook SPD[14], which provides guidance to developers on promoting to more sustainable modes of travel. The Streetbook SPD highlights that LBI is fundamentally committed to an incremental shift towards more sustainable forms of transport, specifically walking and cycling. Accordingly, suggests that all schemes should demonstrate how they facilitate a shift towards sustainable forms of transport.

9.36. The SPD also recommends that an assessment of the existing and potential for new cycle routes and sustainable transport facilities are produced as part of the TA. The SPD acknowledges the continued need for transport professionals to engage in pre-application discussions and consultation with Borough transport officers and to demonstrate how the scheme facilitates modal shift to more sustainable modes.

London Borough of Islington Urban Design Guide - Supplementary Planning Document, 2006

9.37. The LBI's Urban Design Guide[15] provides urban design principles for development within the LBI, based on policies contained within the LDF.

9.38. The need to strengthen connections is identified within the SPD and in particular the need to clearly define through-routes to minimise walking distances to public transport interchanges. The SPD encourages car free housing development in areas of high public transport accessibility and states that "*parking permits for new housing will only be provided for essential users.*" On underground parking, it is recommended that solutions should be sought for off-street parking that ideally allows it to benefit from 24 hour surveillance and to be hidden from view.

Assessment Methodology and Significance Criteria

Assessment Methodology

9.39. In order to assess the significant effects of each Development Scenario, a TA was undertaken. As part of the pre-application dialogue, SKM produced a TA Scoping Report which was submitted to all the relevant highway authorities to agree the scope and the methodology of the TA. In addition, a Transport Workshop meeting was held on 17 October 2012, and a technical note submitted to the highway authorities addressing comments raised. A pre-application meeting was held also with TfL on 16 January 2013.

9.40. The methodology used for the assessment of highway, public transport, pedestrian and cycle-related effects is summarised below. Further details are provided within Appendix 9.1:

- Consulting relevant officers at LBI, LBC and TfL;
- Collecting and / or estimating baseline data relating to:
  - Existing traffic flows on the main highways;
  - Public transport provision; and
  - Pedestrian and cyclist facilities.

- Assessing the assumed future baseline conditions;
- Assessing likely significant effects during the proposed demolition and construction works using construction estimates by MACE;
- Estimating trip generation resulting from the completed and operational Development Scenarios using standard database sources such as TRICS and TRAVL, together with traffic surveys;
- Estimating trip demands for public transport, walk and cycle associated with each Development Scenario;
- Estimating trip demands for servicing associated with each Development Scenario;
- Identifying mitigation measures to offset any likely significant adverse effects in relation to the above where necessary; and
- Assessing the nature and significance of the likely residual effects, accounting for the mitigation measures where appropriate.

9.41. All assessments were undertaken in accordance with 'Transport Assessment Best Practice Guidance Document'[16]. This Chapter summarises the findings of the TA and the issues covered in this Chapter are considered in full in the TA.

9.42. Existing traffic flows in the area around the Site were established from fully classified turning counts which were undertaken on Thursday 13 September 2012.

9.43. Recent five year records of road traffic accident statistics were obtained from the LBI and LBC to determine the safety of local roads surrounding the Site. The records supplied provided an overview of all recorded accidents from 1 July 2007 to 30 June 2012.

9.44. As agreed with the relevant highway authorities, junction capacity assessments were carried out as follows:

- Farringdon Road / Rosebery Avenue signalised junction;
- Farringdon Road / Kings Cross Road / Calthorpe Street / Margery Street / Lloyd Baker Street signalised junction;
- Mount Pleasant / Rosebery Avenue priority junction;
- Mount Pleasant / Phoenix Place priority junction;
- Phoenix Place / Gough Street priority junction; and
- Calthorpe Street / Phoenix Place / Pakenham Street priority junction.

9.45. Fully classified traffic surveys were undertaken at the above junctions on Thursday 13 September 2012. These surveys indicated that the AM and PM network peak periods fall between 08:30 and 09:30 and between 18:00 and 19:00 respectively. In addition to recording traffic flows by vehicle type, the surveys recorded on site green times, cycle times, saturation flows, Degree of Saturation (DoS), and queue lengths. Signal data (timing sheets, SLDs) for the two signalised junctions, together with M16/17/18 data and ASTRID / demand dependency data recorded and supplied by TfL for the specific survey day.

9.46. In addition to the junction counts, fully classified entry and exit counts were undertaken for all the Mount Pleasant Sorting Office operational accesses on 13 September 2012. The staff car park to the adjacent Mount Pleasant Sorting Office (accessed from Phoenix Place) was also surveyed on 20 September 2012.

9.47. The junctions of Kings Cross Road / Farringdon Road / Margery Street / Calthorpe Street / Lloyd Baker Street and Farringdon Road / Rosebery Avenue on the A201 operate within the same Urban Traffic Control (UTC) region. Therefore, TranEd Version 2 was used to assess the traffic capacity of the junctions. The priority controlled site access to the Mount Pleasant Sorting Office off Farringdon Road, between the two junctions, was also modelled as part of the network.

9.48. On Site survey and signal data were recorded in line with the TfL modelling guidelines and all the models accurately reflects on-Site conditions. Whilst the assessment presented in this Chapter is based on the assumed future baseline conditions, existing traffic survey data was used to validate the future baseline, and therefore is set out in this Chapter.

9.49. The remaining priority controlled junctions were modelled using PICADY software.

9.50. Estimates of the assumed future baseline traffic, taking account of 'committed development' and growth in Royal Mail operational traffic were produced and capacity assessments of each of the junctions repeated using these.

9.51. Finally estimates of traffic generated by each of the Development Scenarios were undertaken; this traffic was assigned to the road network and junction capacity assessments repeated. Comparing the assumed future baseline and with each of the Development Scenarios junction performance identifies the likely significant effects on the capacity of the road network.

Significance Criteria

9.52. Guidance provided by the then Institute of Environmental Assessment[17] (IEA) and Department for Transport[18] (DfT) was consulted to identify the significance criteria applicable to the assessment. However, for a number of effects, there are no standard thresholds of significance. In such cases, professional judgement was applied based on knowledge of the Site and professional experience.

9.53. Likely significant effects are therefore described as:

- **Negligible:** Meaning that the effect is too small to measure meaningfully so that there is no significant effect;
- **Beneficial:** Meaning the effect provides a benefit in terms of transportation and access; and
- **Adverse:** Meaning the effect provides disbenefits in terms of transportation and access.

9.54. Beneficial and adverse effects are further characterised as:

- **Minor:** Slight, very short or highly localised effect;
- **Moderate:** Limited effect (by extent, duration or magnitude); and
- **Substantial:** Considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

Existing Conditions

Vehicular Site Access, Road Links and Highways

Vehicular Site Access

9.55. Public access is not currently permitted onto the Site, which is screened by a perimeter wall. However, as shown in Figure 9.1, there are a number of vehicular access points. All the vehicular entry / exit points for the Calthorpe Street site are for the use of the Applicant's operational vehicles only. There is a main entry / exit on Farringdon Road which is used for operational vehicles and there is also a vehicle exit point onto Phoenix Place (opposite Calthorpe House) which again is used by operational vehicles associated with the Mount Pleasant Sorting Office. In addition, there is a vehicle entry on the corner of the Mount Pleasant / Phoenix Place junction which provides access to the basement of the Sorting Office (which houses 23 loading bays that serve the EC1 postcode areas). Vehicles then egress via an exit onto Phoenix Place. There are a number of other gated access points around the Site, most notably on Calthorpe Street and onto Rosebery Avenue.

9.56. Vehicular access to the Phoenix Place site is primarily available for staff accessing Royal Mail's staff car park. This is barrier-controlled and only staff with parking permits are allowed access. Parts of the Phoenix Place site are also used for overspill operational parking.

Road Links and Highways

9.57. Figure 9.2 shows the existing road links and highways of key importance surrounding the Site. These are described in more detail below. It should be noted that the baseline traffic conditions for the principal roads surrounding the Site are also outlined below

9.58. The A201 (Farringdon Road) forms the principal route along the eastern side of the Site. The A201 extends from the Pentonville Road (A501) junction to the north of the Site to the Elephant and Castle roundabout to the south.

9.59. Farringdon Road is an approximately 12m wide two-way single carriageway road and is designated as a 'red route' by TfL. Adjacent to the Site, a bus lane extends along both sides of Farringdon Road, with a taxi rank in place along the red route. The existing average weekday two-way traffic flow along Farringdon Road (50m south of the Site vehicular access) is 1,129 vehicles during the AM peak hour (08:30 to 09:30) and 1,298 vehicles during the PM peak (18:00 to 19:00).

9.60. Calthorpe Street (B502) varies in width from 9.3m to 11.5m and is predominantly a 9m wide two-way single carriageway road which extends from Farringdon Road to the east to Grays Inn Road to the west. The B502 continues westerly to connect with the A4200. A vehicle width restriction (of 7 feet) is in place on Calthorpe Street; west of the Calthorpe Street / Phoenix Place / Pakenham Street junction. Calthorpe Street also has a raised table at its junction with Pakenham Street.

9.61. The existing average weekday two-way traffic flows along Calthorpe Street (50m west of its junction with Farringdon Road) are 526 vehicles during the AM peak and 472 vehicles during the PM peak.

9.62. Phoenix Place is a two-way single carriageway road, with road widths varying from between 5.5m to 10m. Phoenix Place extends from Calthorpe Road in the north to Mount Pleasant in the south, and extends through the Phoenix Place site. Speed bumps are intermittently spaced along Phoenix Place. The Mount Pleasant / Phoenix Place / Warner Street junction is raised. The existing average weekday two-way traffic flow along Phoenix Place (50m north of its junction with Mount Pleasant) is 238 vehicles during the AM peak and 234 vehicles during the PM peak.

9.63. Mount Pleasant also varies in width from 8.5m to 11.5m and is a two-way single carriageway road extending from Rosebery Avenue in the north-east to Gough Street in the south-west. On street car parking extends along both sides of Mount Pleasant. The existing average weekday two-way traffic flow along Mount Pleasant (50m east of its junction with Phoenix Place) are 181 vehicles during the AM peak and 145 vehicles during the PM peak .

9.64. Rosebery Avenue is a two-way single carriageway road extending from St John's Street (Angel) in the east to Clerkenwell Road (A401) in the south west. The section of Rosebery Avenue between its junctions with Farringdon Road and Clerkenwell Road is predominantly 10m wide with on street parking located intermittently on both sides of the road. The existing average weekday two-way traffic flows along Rosebery Avenue (50m west of its junction with Farringdon Road) are 806 vehicles during the AM peak and 786 vehicles during the PM peak.

9.65. Gough Street is predominantly a 6.5m wide access road. The initial section, leading north from its junction with Mount Pleasant to its junction with Coley Street, has a one way southbound operation in place. Gough Street does not connect with Calthorpe Street. The existing average weekday two-way traffic flow along Gough Street (50m north of its junction with Mount Pleasant) is 33 vehicles during the AM peak and 49 vehicles during the PM peak.

9.66. The existing traffic flows for the local road network are summarised in Figures 9.3 and 9.4 for the weekday morning and evening peaks respectively.

Accident Analysis

9.67. Between 1 July 2007 and 30 June 2012 there were 51 recorded accidents in the area around the site involving 102 vehicles (including pedestrians) in total. There were no fatalities during this period, but ten accidents (19%) were recorded as being 'serious' and 41 (80%) were recorded as being 'slight'. Within Greater London, the average percentage of fatal and serious road traffic accidents combined is 12%. For injuries classified as being 'slight', the London average is 88% ('Levels of Collision Risk in Greater London', Issue 13, April 2012, TfL). Therefore, there is a higher level of serious accidents in the area around the site compared to the London average, but a lower level of slight accidents.

9.68. A total of 43 of the accidents (85%) occurred during weekdays and 8 (15%) occurred during the weekend. Only six recorded accidents occurred during the weekday AM peak and only two occurred during the weekday PM peak. The majority of recorded accidents in the local area occurred on the main surrounding Site.

9.69. At the Rosebery Avenue / Farringdon Road junction there were 16 recorded accidents, three of which were serious. A total of 31% of all recorded accidents in the area around the site occurred at this junction. Out of the 16 accidents, six involved cyclists, four involved pedestrians and six involved motorised vehicles.

9.70. At the Calthorpe Street / Margery Road / Farringdon Road junction, there were 16 recorded accidents, three of which were serious. A total of 31% of all recorded accidents in the study area occurred at this junction. Out of the 16 accidents, six involved cyclists, two involved pedestrians and eight involved motorised vehicles.

9.71. At the Calthorpe Street / Pakenham Street / Phoenix Place junction there were 13 recorded accidents, two of which were serious. A total of 26% of all recorded accidents in the area around the site occurred at this junction. Out of the 13 accidents, 11 involved cyclists and two involved motorised vehicles.

9.72. At the Rosebery Avenue / Coldbath Square junction there were three recorded accidents, none of which were serious. A total of 6% of all recorded accidents in the area around the site occurred at this junction. Out of the three accidents, one involved a cyclist, one involved a pedestrian and one involved a motorised vehicle.

9.73. Cars attributed to 39% of all the recorded accidents and bicycles were involved in 26% of recorded accidents. Motorcycles accounted for 16% of recorded accidents. The Greater London average for car accidents is 76.5%, for bicycles is 16.2% and for motorcycles is 25%. Therefore, the percentage of car and motorcycle accidents in the area around the site is well below the London average. However, bicycle accidents in the area around the site are 10% higher than the London average.

9.74. There were no recorded incident involving buses and only one accident (1% of vehicles) involved a Heavy Goods Vehicle (HGV), despite the Site situated along a high bus and HGV traffic route. A total of 9% of recorded accidents involved Light Goods Vehicles (LGV) (nine accidents) and 7% of recorded accidents involved a collision between a pedestrian and another vehicle. The London average for bus accidents is 9% and for HGVs and LGVs combined is 15%. Furthermore, the London average for pedestrian accidents is 15%. Therefore, a lower percentage of bus, HGV, LGV and pedestrian accidents occur on local roads surrounding the site compared to the London average.

9.75. Since the accident statistics showed a maximum of 16 recorded accidents over the five year period at any one junction, it is not considered that there are any specific road safety issues at junctions surrounding the Site. The statistics also demonstrate that there is no correlation or significant similarity in the nature of accidents on the local surrounding roads.

Pedestrian and Cycle Access and Facilities

Pedestrian Access and Network

9.76. As previously noted, public access to the Site is not currently permitted. However, security controlled pedestrian access into the Site is provided from Farringdon Road for staff of the Mount Pleasant Sorting Office.

9.77. All of the principal routes surrounding the Site have footways which are well lit.

9.78. The Farringdon Road / Kings Cross Road / Margery Street / Calthorpe Street junction is signalised, with pedestrian crossings available on all arms. The Farringdon Road / Rosebery Avenue is also signalised, and again provides controlled pedestrian crossings on all arms. Recently pedestrian countdowns have been incorporated at the Farringdon Road/ Rosebery Avenue junction, which provides pedestrians an indication of how long they have to cross the road after the green man light has gone out.

9.79. The road, Phoenix Place, has footways which vary in width; on the eastern side the footway varies between 2.1m to 4.4m, and on the western side this varies between 1.7m 3.4m. The footway on the southern section of Calthorpe Street measures approximately 2.8m in width, with the footway on the northern side of the road varying between 2.3m to 5.2m. The footway on Rosebery Avenue measures approximately 3.5m on both the northern and southern sides of the road, with the footway on Mount Pleasant measuring approximately 3.5m on the southern side, and varying in width between 1.5m and 2.4m on the northern side of the road. Footway widths on Gough Street measure approximately 2.4m on the eastern side, and vary between 2.0m and 3.7m on the western side. Similarly footway widths on Farringdon Road also vary between 1.5m and 2.8m and 3.3m and 3.8m on the western and eastern sides respectively.

9.80. A raised pedestrian central refuge exists on Calthorpe Street, 10m east of the Phoenix Place / Calthorpe Street junction.

Cycle Access and Network

9.81. The Site is very well served by existing cycle links. The TfL Cycle Guide[19] describes the following routes surrounding the Site as 'routes signed, or marked for use by cyclists on a mixture of quiet or busier roads':

- Farringdon Road (A201) from Elephant and Castle to the Farringdon Road / Calthorpe Street junction. The cycle route passing along the eastern boundary of the Site on Farringdon Road is a shared 3m wide bus lane / cycle lane. This operates in a two-way direction;
- Calthorpe Street, from the Calthorpe Street / Phoenix Place junction to the Calthorpe Street / Farringdon Road junction. This section is marked by a 1m wide, on-road cycle lane on the southern side of the road. The restriction states that the cycle lane is only operational 08:30 to 10:30 and 16:30 to 18:30 Monday to Friday. The northern side of the road has a 1m wide cycle lane extending 15m from the junction with Farringdon Road;
- Pakenham Street (in its entirety). This has no cycle lanes marked;
- Margery Street, from the Margery Street / Farringdon Road junction to the Margery Street / Amwell Street junction. The eastbound section is marked with a 1m wide on-road contraflow cycle lane. The westbound side is unmarked, but signed as a cycle lane; and
- Rosebery Avenue, between its junction with Farringdon Road and the Rosebery Avenue / Rosoman Street junction. These cycle lanes have widths of 1m and are intermittently marked on street.

9.82. In addition, the TfL Cycle Guide describes the following routes surrounding the Site as 'quieter roads that have been recommended by cyclists':

- Mount Pleasant (in its entirety);
- Rosebery Avenue, between the Rosebery Avenue / Clerkenwell Road junction and the Farringdon Road / Rosebery Avenue junction; and
- Phoenix Place (in its entirety).

9.83. Figure 9.5 shows the location of cycle routes in relation to the Site. The cycle route which passes the eastern side of the Site on Farringdon Road extends past Farringdon Station to Elephant and Castle in the south, where it connects with Cycle Superhighway 7 (Morden to The City). Farringdon Station can be accessed by bicycle in approximately 5 minutes from the Site.

Barclays Cycle Hire

9.84. In addition to the local accessible cycle routes, five Barclays Cycle Hire stations are located within 5 minutes' walk of the Site, as shown in Figure 9.5, and provide a total of 101 cycles.

Public Transport

Public Transport Accessibility Level

9.85. The Site is located in Zone 1 and is well served by public transport. The TfL Public Transport Accessibility Level (PTAL) Calculator was used to assess the PTAL score of the Site. On the Phoenix Place site, the PTAL is 6b. On the Calthorpe Street site the PTAL varies from 6a (at the southern part of the site, i.e. closest to the Mount Pleasant Sorting Office) and PTAL 5 on the part of the site near Calthorpe Street.

Bus Services

9.86. The Site is very well served by existing bus routes. A total of nine bus routes have stops which are accessible within PTAL walking distance (640m or 8 minutes' walk) of the Site. The nine accessible bus routes surrounding the Site provide a viable sustainable travel option to the majority of central London. The closest bus stops to the Site are:

- The bus stop on Farringdon Road (classified as stop PS), located approximately 30m south of the junction with Calthorpe Street, which serves the northbound 63 service towards Kings Cross. Southbound services are available from the CG bus stop, which is located approximately 30m north of the Farringdon Road / Rosebery Avenue junction; and
- Bus stops CK and CJ on Rosebery Avenue, north of its junction with Farringdon Road. These stops serve the southbound 19, 38 and 341 services. The closest northbound bus stop for these services is located on Roseberry Avenue, approximately 30m north of its junction with Warner Street, classified as sop CF. Services are also available at stops CE and CN, also located on Rosebery Avenue.

9.87. Further bus services are available on Clerkenwell Road, and Grays Inn Road. Figure 9.6 shows the location of bus stops within 400m of the Site (5 minutes' walk, which is the maximum recommended distance to bus stops for new developments as outlined in the IHT Guidelines Planning for Public Transport in New Developments[20]), and the routing of the buses serving those bus stops.

Rail Services

9.88. The Site is strategically located between Kings Cross / St Pancras and Farringdon Stations, which are shown in Figure 9.7. Farringdon Station is located 900m walking distance south-east (11 minutes' walk) from the centre of the Site. This is the closest National Rail Station to the Site.

9.89. Kings Cross and St Pancras National Rail Stations are located outside the permissible PTAL walking distance from the Site (960m). These stations are located approximately 1.3km walking distance north-west (16 minutes' walk) from the centre of the Site. Kings Cross and St Pancras Stations provide national and international train services.

London Underground

9.90. Farringdon Station is the only London Underground Station located within PTAL walking distance of the Site (11 minutes' walk). Farringdon Station is served by three London Underground lines (Circle, Metropolitan and Hammersmith & City). When Crossrail opens in 2018, Farringdon Station will also be served by Crossrail trains.

9.91. Although Kings Cross and St Pancras Stations are located outside of the permissible PTAL walking distance, they are important stations in terms of London Underground access from the Site. Kings Cross and St Pancras Stations are served by six London Underground lines (Victoria, Northern, Metropolitan, Circle, Hammersmith & City and Piccadilly).

9.92. London Underground Stations at Angel (Northern Line), Chancery Lane (Central Line), Holborn (Central and Piccadilly Lines) and Russell Square (Piccadilly Line) are all located approximately 1km (15 minutes' walk) from the centre of the Site.

9.93. All these stations are shown in Figure 9.7.

Junction Analysis

9.94. At the junction of Kings Cross Road / Farringdon Road / Margery Street / Calthorpe Street / Lloyd Baker Street, the maximum DoS is 90% on the Farringdon Road southbound approach, with the westbound approach also experiencing a relatively high DoS of 88%. The remaining arms operate below 60%. In the PM peak the modelling shows the maximum DoS of 80% occurring on the eastbound Calthorpe Street approach, with all other arms operating below 70%.

9.95. At the junction of Farringdon Road / Rosebery Avenue the maximum DoS is 95% on the Roseberry Avenue westbound approach. The remaining arms operate below 90%. In the PM peak the modelling shows the maximum DoS of 97% occurring on the northbound Farringdon Road approach. The Roseberry Avenue arm operates at 93%, with all other arms operating below 90%.

9.96. The modelling of the priority controlled Farringdon Road / Mount Pleasant Sorting Office access junction shows significant spare capacity with a maximum DoS of 47% on the southbound Farringdon Road approach in the AM peak period, and 43% in the PM peak period.

9.97. The junctions of Mount Pleasant / Phoenix Place, Phoenix Place / Calthorpe Street / Pakenham Street and Mount Pleasant / Roseberry Avenue / Coldbath Square all show a significant degree of spare capacity.

Future Baseline Conditions

9.98. Royal Mail will have closed three delivery offices in central London and transferred their respective activities, including vehicles, to the adjacent Mount Pleasant Sorting Office prior to any demolition and construction works commencing on either the Phoenix Place site or the Calthorpe Street site. This will intensify operations and vehicle movements at the Mount Pleasant Sorting Office as noted within the Mount Pleasant SPD. The relocation of delivery office activities and the associated increased staff at the Mount Pleasant Sorting Office will lead to increased vehicle movements around the Site. The forecasting methodology is described in further detail in the TA (see Appendix 9.1). Essentially the increase in traffic was based on the Applicants proposed fleet numbers for the future. Table 9.1 shows both the existing and future fleet numbers as provided by the Applicant.

Table 9.1: Royal Mail Existing and Future fleet numbers

Vehicle type	Existing fleet numbers	Proposed fleet numbers
Shunter	1	205
100cft	5	
225cft	34	
400cft	19	
400 tail-lift	0	
Pool Cars/ Misc	1	
Small crew bus 225cft	8	
Large Crew Bus 400 cft	17	
6.5T	10	46
7.5T	28	
Trailers	8	3
Total	131	254

9.99. The above table shows that there is almost a doubling of fleet numbers. However, much of this increase is as a result of an increase in vans. There is only a relatively small increase in HGV's, and furthermore a reduction in the number of artics which will access the Site.

9.100. Traffic surveys undertaken in September 2012 provided the total number of operational vehicles entering and exiting the Mount Pleasant Sorting Office. These operational traffic flows were "uplifted" to take into account the increase in operational fleet. Furthermore, the future PCU's were estimated by looking at the proportion of LGV, HGV and artics and applying PCU factors. Table 9.2 summarises the future traffic flows, during the network peak periods, as well as over a 24 hour period. For completeness the existing flows are also shown.

Table 9.2: Royal Mail Existing and Future Fleet Numbers

Future Baseline – Operational trips		
Time period	**Total Vehicles into Mount Pleasant**	**Total Vehicles out of Mount Pleasant**
08:30-09:30hrs	43	68
18:00-19:00hrs	227	163
24 hours	1582	1627
HGV veh per 24 period	402	401
Existing (from traffic surveys)		
08:30-09:30hrs	22	35
18:00-19:00hrs	117	84
24 hours	816	839
HGV veh per 24 period	377	376

9.101. It should be noted that vehicles would continue to use the vehicular accesses and routes in the future baseline scenario as they currently use.

9.102. In addition to the increase in operational traffic, there will also be an increase in staff numbers which have been forecast by the Applicant. In a similar methodology to that used to forecast the operational traffic, the future staff trips have been forecast by taking the existing vehicle flows in and out of the staff car park, and providing an uplift to reflect the increase in staff numbers.

9.103. Table 9.3 and Table 9.4 below outlines the existing and future staff numbers, as well as the existing vehicle flows in and out of the staff car park (recorded from traffic surveys), as well as an estimate of future staff trips (based on future staff numbers).

Table 9.3: Royal Mail Existing and Future Staff Vehicle Flows

Existing staff numbers (and shifts)	
Early (06:00-14:00hrs)	480
Day (08:00-16:00hrs)	240
Late (14:00-22:00hrs)	820
Night (22:00-06:00hrs)	350
Total	1890
Proposed staff numbers and shifts	
Early (06:00-14:00hrs)	880
Day (08:00-16:00hrs)	700
Late (14:00-22:00hrs)	960
Night (22:00-06:00hrs)	430
Total	2970

Table 9.3: Royal Mail Existing and Future Staff Vehicle Flows

Future Baseline – Staff Trips		
Time period	**Total Vehicles into Mount Pleasant**	**Total Vehicles out of Mount Pleasant**
08:30-09:30hrs	14	14
18:00-19:00hrs	8	13
24 hours	453	385
Existing Staff Trips (from traffic surveys)		
08:30-09:30hrs	9	9
18:00-19:00hrs	5	8
24 hours	288	245

9.104. As outlined earlier, staff work on four shifts which cover - Early (06:00-14:00hrs), Day (08:00-16:00hrs), Late (14:00-22:00hrs) and Night (22:00-06:00hrs), and these are outside of the network peak periods. Therefore there is a very small increase in traffic during these peak periods. Over a 24-hour period, there is an increase of 165 vehicles into the Site, and 140 out of the Site.

9.105. It should be noted that these staff would continue to use the existing surface car park which is accessed off Phoenix Place.

9.106. The junctions were assessed under the assumed future baseline conditions (i.e. taking account of the intensification at the Mount Pleasant Sorting Office). The results indicate that:

- At the junction of Kings Cross Road / Farringdon Road / Margery Street / Calthorpe Street / Lloyd Baker Street, during the AM peak the maximum DoS remains at 90% on the Farringdon Road southbound approach, with the Margery Street arm also experiencing a relatively high DoS of 89%. The remaining arms operate below 60%. In the PM peak the modelling shows the maximum DoS of 84% occurring on the eastbound Calthorpe Street approach, with all other arms operating below 70%;
- At the junction of Farringdon Road / Rosebery Avenue the maximum DoS is 95% on the Roseberry Avenue westbound approach in the AM peak. The remaining arms operate below 90%. In the PM peak the modelling shows the maximum DoS of 107% occurring on the northbound Farringdon Road approach, with the Rosebery Avenue eastbound and westbound approaches operating at 100% and 90% respectively;
- The modelling of the priority controlled Farringdon Road / Mount Pleasant Sorting Office access junction shows significant spare capacity with a maximum DoS of 48% on the southbound Farringdon Road approach in the AM peak, and 45% in the PM peak; and
- The junctions of Mount Pleasant / Phoenix Place, Phoenix Place / Calthorpe Street / Pakenham Street and Mount Pleasant / Roseberry Avenue / Coldbath Square all show a significant degree of spare capacity, even under the future baseline conditions.

Potential Effects

Demolition and Construction

Development Scenario 1

9.107. The number of demolition / construction vehicles accessing the Site would vary during the various phases of the demolition and construction works associated with Development Scenario 1. It is anticipated that demolition of all structures on the Phoenix Place site would take place, with construction commencing in the southern part of the Phoenix Place site, and then proceeding onto the northern part. Subsequently, the demolition and Enabling works on the Calthorpe Street site would take place, followed by construction of the Calthorpe Street Development itself.

9.108. For the Calthorpe Street site, it is anticipated that traffic initially would make use of the existing Mount Pleasant Sorting Office access on Farringdon Road, and then exit the Calthorpe Street site via Phoenix Place, although some larger vehicles may need to exit via Farringdon Road. A new temporary access would be created off Farringdon Road to allow construction of the new ramp down to the basement, and the new access road to existing delivery / service yard, as well as the new permanent entrance to the Mount Pleasant Sorting Office on Farringdon Road. The new permanent access would then be used by Royal Mail vehicles, which would allow construction vehicles associated with the Calthorpe Street site to make use of the existing Sorting Office access on Farringdon Road to enter the Site, with vehicles exiting via the existing exit on Phoenix Place.

9.109. It is anticipated that construction traffic for the Phoenix Place site would make use of the existing access on Phoenix Place. The main approach routes for construction traffic would be from the strategic road network. Therefore, all traffic would approach the Site via Farringdon Road.

9.110. The additional traffic generated by vehicles involved in the demolition phase would be small when compared to the existing traffic volumes and flows already occurring on the local highway network. The exact number of vehicles would be dependent on the quantities of waste / materials to be removed from the Site, however at this stage it is estimated that this would be approximately eight two-way trips per day. In terms of the wider strategic highway network, the potential effect would be **negligible**.

9.111. It is estimated that for this Development Scenario during the construction phase the maximum number of vehicles per hour which would access the Site would be 23 two-way vehicle movements. The additional traffic generated by construction vehicles would be small when compared to the existing traffic volumes and flows already occurring on the local highway network. In terms of the wider strategic highway network, the potential effect would be **negligible**.

Development Scenario 2

9.112. Demolition and the Enabling Works would take place on the Calthorpe Street site, followed by construction of the Calthorpe Street Development itself. Access would be as described for this part of the Site under Development Scenario 1.

9.113. The additional traffic generated by vehicles involved in the demolition phase would be small when compared to the existing traffic volumes and flows already occurring on the local highway network. The exact number of vehicles will be dependent on the quantities of waste / materials to be removed from site, however at this stage it is estimated that this would be approximately 4 two-way trips per day. In terms of the wider strategic highway network, the potential effect would be **negligible**.

9.114. It is estimated that for this Development Scenario during the demolition / construction phase the maximum number of vehicles per hour which would access the Calthorpe Street site would be 19 two-way vehicle movements. The additional traffic generated by construction vehicles would be small when compared to the existing traffic volumes and flows already occurring on the local highway network. In terms of the wider strategic highway network, the potential effect would be **negligible**.

Development Scenario 3

9.115. The demolition works on the Phoenix Place would be followed by construction of the Phoenix Place Development itself. Access would be as described for this part of the Site under Development Scenario 1.

9.116. The additional traffic generated by vehicles involved in the demolition phase will be small when compared to the existing traffic volumes and flows already occurring on the local highway network. The exact number of vehicles will be dependent on the quantities of waste / materials to be removed from site, however at this stage it is estimated that this would be approximately four two-way trips per day. In terms of the wider strategic highway network, the potential effect would be **negligible**.

9.117. It is estimated that for this Development Scenario during the construction phase the maximum number of vehicles per hour which would access the Phoenix Place site would be 12 two-way vehicle movements. The additional traffic generated by demolition / construction vehicles would be small when compared to the existing traffic volumes and flows already occurring on the local highway network. In terms of the wider strategic highway network, the potential effect would be **negligible.**

Completed Development.

Road Traffic and Highway Capacity

9.118. The likely significant effects of traffic associated with the three Development Scenarios was ascertained by comparing the future baseline model results outlined above, with the 'with development' junction model results. This comparison is summarised below for the three Development Scenarios.

Development Scenario 1

9.119. In the AM peak at the junction of Kings Cross Road / Farringdon Road / Margery Street / Calthorpe Street / Lloyd Baker Street, the maximum DoS would remain at 90% for the Kings Cross southbound ahead approach. Therefore, there would be no change from the future baseline condition. There would be a small increase in the DoS for Margery Street to 91%, compared to 89% in the future baseline condition. The queue on the Margery Street approach would increase by one vehicle. All other links would operate below 90%. In the PM peak all links would operate below 90%.

9.120. In the AM peak, at the junction of Farringdon Road / Rosebery Avenue the maximum DoS on Rosebery Avenue westbound would increase to 96%, compared to 95% in the future baseline condition, although the queue would remain the same length. The DoS on the Farringdon Road southbound approach would rise to 92% compared to 85% in the future baseline condition. The queue on this link would increase by only five vehicles. All other links would continue to operate below 90%. In the PM peak, the DoS on Rosebery Avenue westbound would increase to 93%, compared to 90% from the baseline condition, and there would be an increase in two vehicles in queue. The DoS on Farringdon Road would reduce slightly to 104% (from 107% in the future baseline condition), and the DoS along Rosebery Avenue eastbound would remain the same. All other links would operate below 90%.

9.121. Modelling of the priority controlled Farringdon Road / Mount Pleasant Sorting Office access junction shows that it would continue to operate well below 90%.

9.122. The junctions of Mount Pleasant / Phoenix Place, Phoenix Place / Calthorpe Street / Pakenham Street and Mount Pleasant / Roseberry Avenue / Coldbath Square would all have a significant degree of spare capacity under Development Scenario 1. The Ratio of Flow to Capacity (RFC) along Phoenix Place and Mount Pleasant would decrease because in Development Scenario 1 the existing exit from the Mount Pleasant Sorting Office onto Phoenix Place would be removed and therefore traffic flow along these routes would decrease.

9.123. In view of the above, the potential effect of traffic generated by the completed and occupied Development Scenario 1 on the local highway network capacity would be **negligible**.

Development Scenario 2

9.124. In the AM peak at the junction of Kings Cross Road / Farringdon Road / Margery Street / Calthorpe Street / Lloyd Baker Street, the maximum DoS would remain at 90% for the Kings Cross southbound ahead approach; therefore, there would be no change from the future baseline condition. There would be a small increase in the DoS for Margery Street to 91%, compared to 89% in the future baseline condition. The queue on this approach would increase by one vehicle. All other links would operate below 90%. In the PM peak all links would operate below 90%.

9.125. In the AM peak, at the junction of Farringdon Road / Rosebery Avenue, the maximum DoS on Rosebery Avenue westbound remain at 95%. Therefore there would be no change from the future baseline condition. The DoS on the Farringdon Road southbound approach would rise to 92%, compared to 85% in the future baseline condition. The queue on this link would increase by only five vehicles. All other links would continue to operate below 90%. In the PM peak, the DoS on Rosebery Avenue westbound would increase to 93%, compared to 90% in the future baseline condition, and there would be an increase of two vehicles in the queue. The DoS on Farringdon Road would slightly reduce to 104% (from 107% in the future baseline condition), and the DoS along Rosebery Avenue eastbound would reduce to 99%. All other links would operate below 90%.

9.126. Modelling of the priority controlled Farringdon Road / Mount Pleasant Sorting Office access junction shows that it would continue to operate below 90%.

9.127. The junctions of Mount Pleasant / Phoenix Place, Phoenix Place / Calthorpe Street / Pakenham Street and Mount Pleasant / Roseberry Avenue / Coldbath Square would all have a significant degree of spare capacity under Development Scenario 2. The RFC along Phoenix Place and Mount Pleasant would decrease because under Development Scenario 2 the existing exit from the Mount Pleasant Sorting Office onto Phoenix Place would be removed. Therefore, traffic flows along these routes would decrease.

9.128. In view of the above, the potential effect of traffic generated by the completed and occupied Development Scenario 2 on the local highway network capacity would be **negligible**.

Development Scenario 3

9.129. In the AM peak at the junction of Kings Cross Road / Farringdon Road / Margery Street / Calthorpe Street / Lloyd Baker Street, the maximum DoS would remain at 90% for the Kings Cross southbound ahead approach; therefore, there would be no change from the future baseline condition. The DoS for Margery Street would also remain at 89%; the same as the future baseline condition. All other links would operate below 90%. In the PM peak all links would operate below 90%.

9.130. In the AM peak, at the junction of Farringdon Road / Rosebery Avenue the maximum DoS on Rosebery Avenue westbound would be 96%, compared to 95% in the future baseline condition. The DoS on Farringdon Road southbound would remain at 85% (because the exit onto Phoenix Place would still be operational in this scenario and traffic would therefore be using other routes), compared to 85% in the future baseline condition. All other links would continue to operate below 90%. In the PM peak, the DoS on Rosebery Avenue westbound would remain at 90%. The DoS on Farringdon Road remains at 107%, therefore no change from the future baseline condition, and the DoS along Rosebery Avenue eastbound would increase to 101% and the queue increases by one vehicle. All other links would operate below 90%. The queues on these links would remain the same.

9.131. Modelling the priority controlled Farringdon Road / Mount Pleasant Sorting Office access junction shows that it would continue to operate below 90%.

9.132. The junctions of Mount Pleasant / Phoenix Place, Phoenix Place / Calthorpe Street / Pakenham Street and Mount Pleasant / Roseberry Avenue / Coldbath Square would all have a significant degree of spare capacity under Development Scenario 3.

9.133. In view of the above, the potential effect of traffic generated by the completed and occupied Development Scenario 3 on the local highway network capacity would be **negligible**.

Pedestrians and Cyclists

Development Scenarios 1, 2 and 3

9.134. None of the three Development Scenarios would involve any direct works to the cycle routes surrounding the Site. It is considered that pedestrians and cyclists would not be adversely affected by the Calthorpe Street Development or the Phoenix Place Development and the potential effect of Development Scenarios 1, 2 and 3 on pedestrian and cycle routes would be **negligible**.

9.135. . The proposed cycle parking associated with each Development Scenario is as follows:

- Development Scenario 1: 872 residential spaces, 76 residential visitor spaces and 51 commercial spaces;
- Development Scenario 2: 441 residential spaces, 40 residential visitor spaces and 44 commercial spaces; and
- Development Scenario 3: 431 residential spaces, 36 residential visitor spaces and seven commercial spaces.

9.136. Following discussion with TfL, a Barclays Cycle Hire docking station comprising 50 cycles would also be provided along Mount Pleasant (east of Phoenix Place).

9.137. The Development Scenarios 1, 2 and 3 would be accessible to pedestrians and cyclists with a number of routes through the Calthorpe Street Development and Phoenix Place Development. Pedestrian and cycle access and egress to and from the Site would be available at the following locations:

- At two locations on Farringdon Road;
- From Calthorpe Street;
- From Phoenix Place; and
- A new east-West Street linking Phoenix Place with Gough Street.

9.138. The provision of such access would improve the pedestrian and cycle permeability and connectivity of the Site. It should be noted that all the above links and routes would be publicly accessible but would remain in private ownership. The volume and speed of pedestrian, cycle and in some places vehicular traffic would be sufficiently low to allow safe sharing of these spaces for movement without segregation. The layout of each area allows enough space for this.

9.139. It is envisaged this would encourage opportunities for future residents of each Development Scenario and others in the locality to make local journeys by foot and cycle.

9.140. In view of the above, the provision of pedestrian and cycle routes associated with each Development Scenario, improvements to the permeability and connectivity of the Site and surrounding areas would give rise to a **long-term, local beneficial effect** of **moderate significance**.

Accidents and Safety

Development Scenarios 1, 2 and 3

9.141. The existing incidents of road accidents in the area surrounding the Site is minimal (refer to earlier in this Chapter). Given that the effect of traffic generation on all local highways would be **negligible**, it is anticipated that none of the Development Scenarios would increase the risk of road accidents in the local area. The potential effect of trips generated by each of the three Development Scenarios on the risk of road accidents on the local highway network would therefore be **negligible**.

Public Transport

9.142. The daily public transport trip generation arising from the completion and operation of the three Development Scenarios is summarised in Tables 9.5 to 9.7 below.

Table 9.5: Peak Hour All modes Trip Generation for Development Scenario 1

Mode	Weekday AM Peak (08:00 to 09:00)			Weekday PM Peak (18:00 to 19:00)		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Bus	62	89	151	104	79	183
Rail	87	34	121	30	37	66
Taxi	2	6	8	6	3	9
Underground	124	109	232	127	111	238

Table 9.6: Peak Hour All modes Trip Generation for Development Scenario 2

Mode	Weekday AM Peak (08:00 to 09:00)			Weekday PM Peak (18:00 to 19:00)		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Bus	41	48	90	58	48	107
Rail	82	21	102	17	29	45
Taxi	1	3	4	3	2	4
Underground	98	62	160	73	72	146

Table 9.7: Peak Hour Trip Generation for Development Scenario 3

Mode	Weekday AM Peak (08:00 to 09:00)			Weekday PM Peak (18:00 to 19:00)		
	IN	OUT	TOTAL	IN	OUT	TOTAL
Bus	21	41	62	45	31	76
Rail	5	13	19	13	8	21
Taxi	1	3	4	3	1	4
Underground	26	47	73	54	39	92

Development Scenario 1

9.143 Table 9.1 shows that Development Scenario 1 would generate around 230 two-way trips by underground, 60 to 120 two-way trips by rail and between 150 and 180 two-way trips by bus in the peaks. TfL confirmed during pre-application consultation that there would be sufficient capacity to accommodate the additional demand for public transport trips associated with Development Scenario 1. The potential effect of Development Scenario 1 on the public transport network capacity once completed and operational would be **negligible**.

Development Scenario 2

9.144. Table 9.2 shows that Development Scenario 2 would generate around 140 to 160 two-way trips by underground, 45 to 100 two-way trips by railand between 90 and 100 two-way trips by bus in the peaks. As this is less than for Development Scenario 1, there is sufficient capacity on the network to accommodate these trips. The potential effect of Development Scenario 2 on the public transport network capacity once completed and operational would be **negligible**.

Development Scenario 3

9.145. Table 9.3 shows that Development Scenario 3 would generate around 75 to 95 two-way trips by underground, around 20 two-way trips by railand between 60 and 80 two-way trips by bus in the peaks. As this is less than for Development Scenario 1, there is sufficient capacity on the network to accommodate these trips. The potential effect of Development Scenario 3 on the public transport network capacity once completed and operational would be **negligible**.

Access and Servicing

Development Scenario 1

9.146. A number of new vehicular access points are being proposed as part of Development Scenario 1. Vehicular access for the Calthorpe Street Development basement would be provided from The Lane; a new vehicular route off Calthorpe Street. Refuse / servicing vehicles, and deliveries to part of the Calthorpe Street Development, would use this access and continue through a one-way route through the Calthorpe Street Development, which would exit onto Farringdon Road. These vehicles would be restricted to making left turns only onto Farringdon Road, and the kerb radii of this servicing exit was designed to discourage a right turn. An automatic bollard would also restrict any vehicles trying to enter the Calthorpe Street Development from Farringdon Road. This transport access strategy is illustrated in Figure 9.8.

9.147. Access to this servicing route would also be controlled through the use of automatic bollards, to ensure that cars exiting from the car park do not make use of the servicing route. Servicing for the Calthorpe Street Development is intended to take place within this part of the Site, and there are a number of stopping places within the site to accommodate large vehicles.

9.148. The vehicular access point for southern part of the Phoenix Place Development would be from Gough Street; this would provide access for Royal Mail staff car parking, as well as residential car parking. Vehicular access to the northern part of the Phoenix Place Development would be from a new access from Phoenix Place, accessing the basement car park. It should be noted that the two basements of the Phoenix Place Development are not connected.

9.149. Refuse / servicing and any deliveries are proposed to take place from Gough Street, Phoenix Place and Mount Pleasant, and this was agreed with highways officers at LBC.

9.150. Given the above, proposed access and servicing arrangements are deemed to be appropriate and acceptable, thus the potential effect in relation to Development Scenario 1 is considered to be **negligible**.

Development Scenario 2

9.151. Vehicular access for the Calthorpe Street Development basement is to be provided from The Lane, a new vehicular route off Calthorpe Street. Refuse / servicing vehicles, and deliveries to part of the Calthorpe Street Development, would use this access and continue through a one-way route through the Calthorpe Street Development, which exits onto Farringdon Road. These vehicles would be restricted to making left turns only onto Farringdon Road, and the kerb radii of this servicing exit was designed to discourage a right turn. An automatic bollard would also restrict any vehicles trying to enter the Calthorpe Street Development from Farringdon Road. Again, this transport access strategy is illustrated in Figure 9.8.

9.152. Access to this servicing route would also be controlled through the use of automatic bollards, to ensure that cars exiting from the car park do not make use of the servicing route. Servicing for the Calthorpe Street Development is intended to take place within this part of the Site site, and there are a number of stopping places within the site to accommodate large vehicles.

9.153. Given the above, proposed access and servicing arrangements are deemed to be appropriate and acceptable, thus the potential effect in relation to Development Scenario 2 is considered to be **negligible**.

Development Scenario 3

9.154. The vehicular access point for southern part of the Phoenix Place Development would be from Gough Street; this would provide access for Royal Mail staff car parking, as well as residential car parking. Vehicular access to the northern part of the Phoenix Place Development would be from a new access from Phoenix Place, accessing the basement car park. It should be noted that the two basements of the Phoenix Place Development are not connected. Again, this transport access strategy is illustrated in Figure 9.8.

9.155. Refuse / servicing and any deliveries are proposed to take place from Gough Street, Phoenix Place and Mount Pleasant, and this was agreed with highways officers at LBC.

9.156. Given the above, proposed access and servicing arrangements are deemed to be appropriate and acceptable, thus the potential effect in relation to Development Scenario 1 is considered to be **negligible**.

Car Parking

Development Scenario 1

9.157. A total of 119 residential parking spaces are being provided for Development Scenario 1. This includes provision for the mobility impaired of 34 spaces (5%), with the remainder of parking spaces for the larger family units (3+ bedrooms). Across the Entire Development, this works out as a provision of 0.17 spaces per unit. No car parking is being provided for the commercial units.

9.158. Electric charging points would also be provided within the basement car parks; these are to be provided in accordance with the guidance in the London Plan with 20% of parking spaces for electric vehicles with an additional 20% passive provision for electric vehicles in the future.A further 196 parking spaces are being provided for Royal Mail staff in the basement of the Phoenix Place Development. These replace the surface level parking that is currently available at the Phoenix Place site.

9.159. This level of parking provision, based on local car ownership Census data, is considered to be entirely adequate and appropriate for the Entire Development, without being excessive. The likely effect is considered to be **negligible** for Development Scenario 1.

Development Scenario 2

9.160. A total of 65 residential parking spaces would be provided for Development Scenario 2. This includes provision for the mobility impaired of 17 spaces (5% of total residential units), with the remainder of parking spaces for the larger family units (3+ bedrooms). No car parking is being provided for the commercial units.

9.161. Electric charging points are also to be provided within the basement car park of the Calthorpe Street Development; these are to be provided in accordance with the guidance in the London Plan with 20% of parking spaces for electric vehicles with an additional 20% passive provision for electric vehicles in the future.

9.162. This level of parking provision, based on local car ownership Census data, is considered to be entirely adequate and appropriate for the Site, without being excessive. The likely effect is considered to be **negligible** for Development Scenario 2.

Development Scenario 3

9.163. A total of 54 residential parking spaces would be provided for Development Scenario 3. This includes provision for the mobility impaired of 17 spaces (5% of total residential units), with the remainder of parking spaces for the larger family units (3+ bedrooms). No car parking is being provided for the commercial units.

9.164. Electric charging points are also to be provided within the basement car parks of Phoenix Place; these are to be provided in accordance with the guidance in the London Plan with 20% of parking spaces for electric vehicles with an additional 20% passive provision for electric vehicles in the future.

9.165. A total of 196 parking spaces are being provided for Royal Mail staff within the basement of the Phoenix Place Development. These replace the surface level parking that is currently available at the Phoenix Place site.

9.166. This level of parking provision, based on local car ownership Census data, is considered to be entirely adequate and appropriate for the Site, without being excessive. Again, the likely effect is considered to be **negligible** for Development Scenario 3.

Mitigation Measures

Demolition and Construction

Development Scenarios 1, 2, and 3

9.167. In accordance with best practice, the implementation of Construction Traffic Management Plan would closely control all construction traffic entering and leaving the Site. Vehicles making deliveries to the Site or removing spoil would travel via designated routes which would be agreed with the LBI and LBC as appropriate, TfL and other relevant bodies. The Construction Traffic Management Plan would be developed for each Development Scenario.

9.168. The Construction Traffic Management Plan would be compiled by the Principal Contractor and agreed with LBI and LBC as appropriate and others (as necessary) prior to commencement of any demolition and construction works would include:

- Phased deliveries on a controlled 'just in time' basis, outside peak hours; and
- In the event of unusual activities or events that can be anticipated, the local authorities and the relevant adjacent property owners or occupiers would be notified, in advance of the activity, wherever possible.

9.169. In addition, the passage of all vehicular traffic to and from the Site would adhere to the environmental procedures applicable to all contractors.

Completed Development

Road Traffic

Development Scenarios 1, 2, and 3

9.170. Because the potential road traffic effects would be negligible on all highway links assessed for all three Development Scenarios, there would be no requirement for additional mitigation measures. However, in accordance with national, regional and local planning policies, a Residential Travel Plan was prepared and submitted in support of the planning applications which covers all of the three Development Scenarios, and seeks to encourage the maximum use of sustainable modes of (non-car) travel. Framework Travel Plans have also been prepared for the commercial land uses for each of the Development Scenarios and submitted with the planning applications; these would be revised once the final occupiers of the commercial units are known.

Pedestrians and Cyclists

Development Scenarios 1, 2, and 3

9.171. Given the negligible effects identified for each of the Development Scenarios upon surrounding pedestrian and cycle facilities and the long-term, local potential beneficial effects of moderate significance identified in relation to the proposed pedestrian and cycle routes within each Development Scenario, which would improve the permeability and connectivity of the Site to the surrounding area, additional mitigation is not required.

Accidents and Safety

Development Scenarios 1, 2, and 3

9.172. Similar to the above, none of the Development Scenarios would likely give rise to any significant accident and safety effects. Therefore, no mitigation measures are proposed.

Public Transport

Development Scenarios 1, 2, and 3

9.173. The potential effect of each Development Scenario upon public transport services was identified as negligible. As such, no mitigation is required.

Access and Servicing

Development Scenarios 1, 2, and 3

9.174. It is concluded that each Development Scenario would provide adequate and appropriate access and servicing arrangements. Consequently, no mitigation in these respects is required.

Car Parking

Development Scenarios 1, 2, and 3

9.175. Similar to the above, each Development Scenario would provide an adequate and appropriate level of car parking. As such, mitigation is not required.

Likely Residual Effects

Demolition and Construction

Development Scenarios 1, 2, and 3

9.176. Implementing the Construction Traffic Management Plan would ensure that demolition and construction traffic would not cause undue disruption to users of the local highway network and its capacity. Therefore, the likely residual effect of the demolition and construction works on traffic flows on the local network would be as **negligible** for Development Scenarios 1, 2 and 3.

Completed Development

Road Traffic

Development Scenarios 1, 2, and 3

9.177. For the reasons explained above, no mitigation measures are required in relation to road traffic effects. Therefore, the likely residual effect of road traffic generated by each Development Scenario would be **negligible**.

Pedestrians and Cyclists

Development Scenarios 1, 2, and 3

9.178. With the implementation each of the Development Scenario, new routes would be created and the area would be become more permeable for pedestrians and cyclist and it is therefore considered that the pedestrian and cyclist experience surrounding the Site would be enhanced and therefore further encouraged. Therefore, the likely residual effect on pedestrian and cyclist journeys around and through Development Scenarios would be improved to a **long-term**, **local effect** of **moderate beneficial significance**.

Accidents and Safety

Development Scenarios 1, 2, and 3

9.179. As noted above, no mitigation measures are required in relation to accident and safety. Therefore, the likely residual effect of road traffic generated by each Development Scenario would be **negligible**.

Public Transport

Development Scenarios 1, 2, and 3

9.180. Mitigation is not required in relation to public transport. Therefore, the likely residual effect for all three Development Scenarios on public transport capacity would be **negligible**.

Access and Servicing

Development Scenarios 1, 2, and 3

9.181. The proposed access and servicing arrangements are deemed to be appropriate and acceptable. Therefore, there would be no potential adverse effects to mitigate. Consequently, the likely residual effect for all three Development Scenarios of the proposed access and servicing arrangements would be **negligible**.

Car Parking

Development Scenarios 1, 2, and 3

9.182. The proposed parking provision associated with the Development is deemed to be appropriate. Therefore, there would be no potential adverse effects to mitigate. Consequently, the likely residual effect for all three Development Scenarios of the proposed parking provision would remain as **negligible**.

Summary

9.183. A summary of the potential effects, proposed mitigation measures and likely residual effects in relation to transportation and access is provided below in Table 9.5.

Table 9.5: Summary of Transportation and Access Related Potential Effects, Mitigation Measures and Likely Residual Effects

Issue	Potential Effect / Significance	Mitigation Measures	Likely Residual Effect / Significance
Demolition and Construction			
Development Scenario 1, 2 and 3			
Construction traffic on the local highway network.	**Negligible** in relation to the wider highway network.	Implementation of Construction Traffic Management Plan which would set out construction traffic logistics to best minimise effects. Agreement of all construction traffic routes with LBC and LBI and other relevant bodies.	**Negligible**.
Completed Development			
Development Scenario 1, 2 and 3			
Road traffic and Highway Capacity	**Negligible**.	None required. However, in line with planning policies a Residential Travel Plan / Framework Travel Plan for commercial uses would be implemented to encourage the use of sustainable modes of transport.	**Negligible**.
Pedestrian and cycle routes surrounding the Site	**Negligible**.	None required. Cycle parking as well as a new Barclays Cycle Hire Docking Station provided	**Long-term**, **local** effect of **minor beneficial** significance.
Addition of pedestrian and cyclist routes throughout the Site resulting in improvements to the permeability and connectivity of the Site	**Long-term**, **local effects** of **moderate beneficial significance**.	None required.	**Long-term**, **local effects** of **moderate beneficial significance**.
Accidents and safety	**Negligible**.	None required.	**Negligible**.
Additional trip generation demand on public transport capacity	**Negligible**.	None required.	**Negligible**.
Access and servicing	**Negligible**.	None required.	**Negligible**.
Parking provision	**Negligible**.	None required.	**Negligible**.

References

1 Department for Communities and Local Government (DCLG). 'National Planning Policies Framework' March 2012
2 Department for Communities and Local Government (DCLG). 'Planning Policy Guidance 13 : Transport' January 2011
3 Greater London Authority (GLA). 'The London Plan Spatial Development Strategy for Greater London' July 2011
4 Greater London Authority (GLA), 'The London Plan, Spatial Development Strategy for Greater London Revised Early Minor Alterations' Draft, June 2012
5 London Borough of Islington (2012) Development Management Policies Submission, June 2012
6 London Borough of Islington (2012) The Streetbook Supplementart Planning Document, Adopted October 2012
7 London Borough of Islington (2012) Site Allocation Submission
8 London Borough of Islington (2011) Finsbury Local Plan 'Area Action Plan for Bunhill and Clerkenwell', Proposed Submission October 2011
9 London Borough of Islington (LBI). 'Core Strategy' February 2011
10 London Borough of Islington (LBI). 'Unitary Development Plan (Saved Policies 2011)' February 2011
11 London Borough of Islington (LBI). 'Planning Standards Guidelines' August 2002
12 London Borough of Camden and Islington (LBC / LBI). 'Mount Pleasant Supplementary Planning Document' February 2012
13 London Borough of Islington (LBI). 'Environmental Design Planning Guidance' October 2012
14 London Borough of Islington (LBI). ' Streetbook Supplementary Planning Document' October 2012
15 London Borough of Islington (LBI) ' Urban Design Guide' December 2006
16 Transport for London (TfL). 'Transport Assessment Best Practice Guidance Document' April 2010
17 Institute for Environmental Assessment (IEA). 'Guidelines for Environmental Impact Assessment' 2004
18 Department for Transport (DfT). 'Assessment and Management of Environmental Effects' August 2008
19 Transport for London (TfL). 'Central London Cycle Guide'
20 Institute of Highways and Transportation (IHT). 'Guidelines for Planning for Public Transport in Developments' 1999

10. Noise and Vibration

Introduction

10.1. This Chapter, which was written by Hoare Lea Acoustics, presents an assessment of the likely noise and vibration effects associated with each of the three Development Scenarios. These potential effects are established in relation both to existing sensitive receptors surrounding the Site and future residents within each of the Development Scenarios. Consideration is given to both the demolition and construction works associated with each Development Scenario, and to the operational phase of the Site following completion of each Development Scenario.

10.2. The Chapter describes the methods used to assess the likely effects, the assumed future baseline conditions of the Site and its environs, and the potential direct and indirect effects of each Development Scenario. In this respect consideration is given to:

- Noise from demolition and construction activities, including construction traffic;
- Increases in operational road traffic attributed to each of the Development Scenarios;
- Ambient noise effects on the proposed Development Scenarios;
- Direct noise and vibration transfer to the proposed residential units above the basement of the Mount Pleasant Sorting Office;
- Vibration and re-radiated noise within each of the Development Scenarios;
- The operation of building services plant; and
- Noise within the proposed courtyards.

10.3. Mitigation measures required to prevent, reduce or offset any significant adverse effects are identified for each Development Scenario. The Chapter concludes with a description of the nature and significance of likely residual noise and vibration effects, taking into account any mitigation measures proposed.

Legislation, Planning Policy and Guidance

Legislation

Construction Noise and Vibration

10.4. In England there are two legislative instruments which address environmental noise and vibration nuisance from construction activities. The Environmental Protection Act 1990[1] (EPA) and the Control of Pollution Act 1974[2] (CoPA). The CoPA provides two means of controlling construction noise and vibration. Section 60 provides Local Planning Authorities (LPA) with the power to impose at any time, operating conditions on a construction site. Section 61 allows the developer to negotiate a set of operating procedures with the LPA prior to commencement of site works.

National Planning Policy

National Planning Policy Framework, 2012

10.5. The National Planning Policy Framework[3] (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. Reference to noise is made in Section 11, paragraph 123 of the NPPF, which states that planning policies and decisions should aim to:

- "*Avoid noise from giving rise to significant adverse effects on health and quality of life as a result of new development.*
- *Mitigate and reduce to a minimum other adverse effects on health and quality of life arising from noise from new development, including through the use of conditions.*
- *Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put upon them because of changes in nearby land uses since they were established.*
- *Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason*".

10.6. Reference is made in the NPPF to the Department for Environment, Food and Rural Affairs (DEFRA) 'Noise Policy Statement for England' (NPSfE) 2010[4]. The NPSfE is intended to apply to all forms of noise other than that which occurs in the workplace, and includes environmental noise and neighbourhood noise in all forms.

10.7. The NPSfE advises that the effect of noise should be assessed on the basis of adverse and significant adverse effect, but does not provide any specific guidance on assessment methods or limit sound levels. This lack of numeric limit sound levels is a direct consequence of the advice also contained in the NPSfE which is that it is not possible to have "*a single objective noise-based measure that is applicable to all sources of noise in all situations*". It further advises that the sound level at which an adverse effect occurs is "*likely to be different for different noise sources, for different receptors and at different times*".In the absence of specific guidance within the NPPF and NPSfE for the assessment of environmental noise, it is considered appropriate to base assessment on LPA requirements, current British Standards and national and international guidance (as described later in this Chapter). However, one noteworthy advisory point in the NPSfE is the need to place into context any general requirements that increases in ambient noise should be 'minimised' (see, for example, the following paragraph 10.11). In this regard the NPSfE states:

'Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as is reasonably practical ….. the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular policy, development or other activity may not have been given adequate weight when assessing the noise implications.'

10.8. The above is of direct relevance to the discussion contained in the following paragraphs in which references to various of the policies and plans considered does, indeed, indicate requirements to 'minimise' noise effects. It is clear from the NPSfE that any such requirements means that the appropriate 'minimisation' must be interpreted within the context and planning balance of the scheme.

Regional Planning Policy

The London Plan: Spatial Development Strategy for Greater London, 2011

10.9. Chapter 7 of the London Plan[5] sets out policies on a range of issues including the effect of noise. Policy 7.15 is specifically concerned with noise pollution and is to be implemented in order to reduce noise and support the objectives of the Mayor's Ambient Noise Strategy[6]. Development proposals should seek to:

- *"reduce noise by: a minimising the existing and potential adverse impacts of noise on, from, within, or in the vicinity of, development proposals;*
- *separating new noise sensitive development from major noise sources wherever practicable through the use of distance, screening, or internal layout in preference to sole reliance on sound insulation; and*
- *promoting new technologies and improved practices to reduce noise at source".*

10.10. The policies are, therefore broadly in accordance with those of the NPPF and NPSfE, also bringing into account the NPSfE advice concerning the use of the term 'minimise'.

10.11. Policy 7.5 'Public Realm' notes that the effects of traffic can have a significant impact on the quality of the public realm in terms noise and amenity of a space. It states "*the negative effects of traffic should be minimised to ensure people's enjoyment of public realm is maximised*", and that "*places should provide opportunity for quiet enjoyment*".

10.12. Policy 7.7 'Location and Design of Tall and Large Buildings' states that tall building should not affect their surroundings in terms of noise.

Revised Early Minor Alterations to the London Plan, 2012

10.13. No specific reference is made to noise in Revised Early Minor Alterations to the London Plan[7].

London Ambient Noise Strategy, 2004

10.14. The Ambient Noise Strategy aims to minimise the adverse effects of noise on people living, working in, and visiting London, using the best available practices and technology within a sustainable development framework.

10.15. The Ambient Noise Strategy aims to work towards a more compact city development, while minimising noise. Guidance is provided on effective noise reduction measures through better design of developments, including introduction of screening and layout. The Strategy also seeks to reduce noise at source by introducing quieter road surfaces and other long term policy objectives.

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

10.16. Under Policy DM1 of London Borough of Islington's (LBI's) Development Management Policies Submission[8], it is a requirement that all forms of development shall not result in an unacceptable adverse effect on residential amenity by noise impact.

10.17. Under Policy DM12, all new housing developments are required to provide accommodation of adequate size, with acceptable shape and layout of rooms (with due consideration to noise).

10.18. Policy DM13 highlights the importance of considering noise from use of outdoor spaces and how this can impact of occupants overlooking the areas.

10.19. Whereas the above policies make mention of noise, Policy DM15 is explicitly concerned with noise, requiring;

- *"A. All development proposals shall demonstrate how potential adverse noise impact on and between dwellings will be mitigated by housing layout, design and materials.*
- *B. The layout of adjacent dwellings and the location of lifts and circulation spaces is required to limit the transmission of sound to noise sensitive rooms within dwellings.*
- *C. Sufficient sound insulation with reasonable resistance to airborne sounds and impact sounds shall be installed in all walls and floors between and within dwellings, and between dwellings and public and/or communal areas.*
- *D. Noise sensitive developments should be adequately separated from major sources of noise, such as road, rail and certain types of development. Mitigation will be required where the noise environment necessitates this. For residential development the noise exposure categories will be used to assess applications. New residential development should wherever possible be sited away from noise generating land uses.*
- E. *Noise generating uses should be sited away from noise sensitive uses".*

10.20. Policy DM15 includes, to assist in assessing the suitability of sites for residential development, a series of Noise Exposure Categories. These are in line with the historical guidance given in the now defunct Planning and Policy Guidance Note 24 (PPG24). Whilst the site may be assessed with respect to these external noise levels, it is common that the LPA will be concerned with the achievability of internal noise conditions to appropriate standards, generally those advised within BS 8233, and the control of noise impact on outdoor amenity spaces.

London Borough of Islington's Site Allocations Submission, 2012

10.21. No specific reference is made to noise in LBI's Site Allocations Submission[9].

London Borough of Islington's Finsbury Local Plan Submission, 2012

10.22. No specific reference is made to noise in the LBI's Finsbury Local Plan Submission[10].

London Borough of Islington's Core Strategy, 2011

10.23. The LBI's adopted Core Strategy[11] acknowledges that "*noise can have a significant effect on the environment and the quality of life enjoyed by individuals and communities*". Existing local noise and vibration affecting a development is addressed in Policy CS12 of the Core Strategy, which states that:

- "*Where external noise and vibration may make a residential development unacceptable, that mitigating measures be prescribed.*
- *The transmission of noise between dwellings should be minimised".*

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

10.24. LBI's Unitary Development Plan[12] (UDP) (adopted June 2002) has been partly superseded by the Core Strategy. Two key saved noise policies are defined for protecting amenity from noise, nuisance and pollution; these are saved policies ENV16 and ENV17. Saved Policy EN17 states: "*when considering applications for new developments and changes of use, the Council will seek to protect or enhance the amenities of the area. Planning permission will not be granted to developments which cause unacceptable levels of noise*".

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

10.25. The London Borough of Camden's (LBC) Site Allocations Proposed Submission Document[13] acknowledges the proposals for the redevelopment of the Site and specifically states that a noise assessment should be submitted with proposals to demonstrate that residential occupiers could be satisfactorily accommodated in proximity to the Mount Pleasant Sorting Office and its attendant comings and goings. Any appropriate noise attenuation measures should be included in the design of residential units.

London Borough of Camden's Core Strategy, 2010-2025, 2010[14]

10.26. The adopted Core Strategy for the LBC sets out the Council's 'planning vision and strategy' for Camden. The Core Strategy recognises that the central location of the Borough results in high levels of noise, and this noise can have an adverse effect on amenity. It states that assessment of the level of amenity should be made by developers on existing and future occupiers. Protection of amenity from noise and vibration is considered in Policy DP28 (further details of which are given below.

London Borough of Camden's Development Policies 2010-2025, 2010

10.27. The LBC's Development Policies[15] document outlines all relevant planning policy, and contains policies relating to noise effects on housing standards and from cultural facilities, entertainment and anti-social behaviour, and retail and commercial operations.

10.28. As referenced in the LBC's Core Strategy, Policy DP28 'Development Management Policies' specifies quantitative criteria in respect of a number of noise related considerations. The policy states:

"The Council will seek to ensure that noise and vibration is controlled and managed and will not grant planning permission for:

a) development likely to generate noise pollution; or

b) development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided.

Development that exceeds Camden's Noise and Vibration Thresholds will not be permitted.

The Council will only grant permission for plant or machinery if it can be operated without cause harm [sic] to amenity and does not exceed our noise thresholds.

The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact".

10.29. Supporting the above excerpt are a number of criteria covering:

- Development site noise levels where planning will not be granted;
- Development site noise levels where attenuation measures will be required;
- Vibration levels on development sites where planning permission will not be granted;
- Noise levels from places of entertainment where planning permission will not be granted; and
- Noise levels from plant and machinery where planning permission will not be granted.

Mount Pleasant Supplementary Planning Document, 2012

10.30. The Mount Pleasant Supplementary Planning Document[16] (SPD) recognises that the Mount Pleasant Sorting Office (to the south-east of the Site) and vehicle movements will operate within an enclosed environment and requires that appropriate mitigation must be used to protect adjacent land uses, particularly new homes. It makes clear that the acceptability of residential uses adjacent to the service yard will be dependent upon achievement of a high quality residential environment at all time of the day and year, with regard to issues such as noise, vibration. No specific objective noise or vibration criteria are stipulated in this SPD.

Guidance

London Borough of Islington Environmental Design Planning Document, 2012

10.31. In terms of noise and vibration, the LBI's Environmental Design SPD[17] seeks for the minimisation of effect from demolition and construction. Section 1.4 of the SPD states that while the control of noise pollution is not specifically addressed, reference should be made to draft Policy DM15[7].

London Borough of Islington Streetbook Supplementary Planning Document, 2012

10.32. The Streetbook SPD[18] also forms a material consideration in the determination of planning applications, and is intended for use as a tool in the design and renewal of streets in the LBI. Design considerations in the SPD address road and pavement surfaces, seating, signage, lighting, art, furniture and trees and planting. Noise is only specifically mentioned once in the SPD, where it is suggested that dense foliage planting schemes could be used as an aid to reduce noise pollution.

London Borough of Islington Urban Design Guide Supplementary Planning Document, 2006

10.33. The Islington Urban Design Guide SPD[19] provides design principles and standards that build upon the policies set out in the adopted Core Strategy and the UDP for the LBI, together with the adopted London Plan. The Urban Design Guide SPD seeks to provide guidance and a framework for assessing planning applications at an all-encompassing local level, rather than at the individual development level. The Urban Design Guide SPD specifically mentions noise on only two occasions:

- "*Sanctuary' from (street) noise should be provided in bedrooms and private gardens. This sanctuary arises from the discussion regarding 'continuity and enclosure'; and*
- *the 'advantages of a perimeter block layout*".

10.34. Policy CS12 of LBI's Core Strategy is reiterated, stating that (among other concerns) noise pollution "*is an issue the Council seeks to address*".

Sustainable Design and Construction Supplementary Planning Guidance, 2006

10.35. The Sustainable Design and Construction Supplementary Planning Guidance[20] (SPG) to the adopted London Plan provides guidance on reducing the effects of noise. It is considered essential to demonstrate that "*adverse impacts of noise have been minimised, using measures at source or between source and receptor (including choice and location of plant or method, layout, screening and sound absorption) in preference to sound insulation at the receptor, wherever practicable*". The development's layout and design should be used to mitigate noise effects, and mitigate noise pollution. The SPG also states that the Mayor's preference is for residential development to achieve internal noise standards in line with 'good' standard as defined by

BS 8233:1999[21] (Table 5) and to improve on Building Regulations[22] (2003) Part E requirements for internal sound transmission by 5dB.

10.36. The SPG recommends considering the overall soundscape (sound features and character of noise in the area) at early design stages. Noise generating activities should be identified and assessed. LPAs should be consulted in particular regarding the control of construction noise. Windows or ventilation system design should incorporate acoustic features to address noise, especially at night time. Street canyons and reflection effects should be considered.

British Standard 5228

10.37. To assess construction noise and vibration, British Standard (BS) 5228 'Noise Control on Construction and Open Sites', Parts 1 to 4[23], is deemed the appropriate source of guidance. The most recent update was published in January 2009 and consolidates all previous parts of the standard into BS 5228 1:2009 (BS 5228-1) for airborne noise and BS 5228 2:2009 (BS 5228-2) for groundborne vibration. These updated standards supersede all previous versions, and were therefore adopted as the relevant versions upon which to base this assessment.

10.38. BS 5228-1 provides guidance on a range of considerations relating to construction noise, including the legislative framework, general control measures, example methods for estimating construction noise levels and example criteria which may be considered when assessing effect significance. Similarly, BS 5228-2 provides general guidance on legislation, prediction, control and assessment criteria for construction vibration.

British Standard 8233 and World Health Organisation Guidelines

10.39. It is considered appropriate that BS 8233 (1999) 'Sound Insulation and Noise Reduction for Buildings - Code of Practice'[18], be adopted when assessing suitable internal noise levels. This standard offers guidance on suitable internal noise levels for dwellings to facilitate good and reasonable resting and sleeping conditions. It is noted that these criteria are based on satisfying the majority of the population accounting for noise from normally occurring external sources including road and rail traffic, but exclude sources such as emergency vehicle sirens and train horns. The recommended levels are for unoccupied conditions. The criteria specified within BS 8233 are generally in line with guidance given by World Health Organisation (WHO) 'Guidelines for Community Noise'[24]. This guidance also indicates that few people would be highly annoyed when exposed to external day-time ambient noise levels of no more than 55dB L_{Aeq} in outdoor living areas.

10.40. BS 8233 is under review and due for revision in April 2013.

British Standard 4142

10.41. BS 4142:1997 'Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas'[25] was originally developed for assessing industrial situations. However, many LPAs recommend adopting BS 4142 in assessing a wide range of noise sources including building services plant in commercial premises.

10.42. BS 4142 is also under review and due for significant revision in March 2014.

Calculation of Road Traffic Noise / Institute of Environmental Management and Assessment / Institute of Acoustics Guidance

10.43. Department of Transport / Welsh Office Memorandum 'Calculation of Road Traffic Noise (CRTN)' (1998)[26] is suitable for environmental assessments of schemes where road traffic noise may have an effect.

10.44. Guidance on effect assessment of traffic noise is also provided within the Joint Institute of Environmental Management and Assessment (IEMA) and the Institute of Acoustics draft guidelines for noise effect assessment[27].

British Standard 6472: Guide to Evaluation of Human Exposure to Vibration in Buildings'

10.45. BS 6472-1 'Guide to Evaluation of Human Exposure to Vibration in Buildings, Part 1: Vibration Sources Other Than Blasting'[28], presents recommended frequency weighted vibration spectra (for continuous vibration) and vibration dose values (VDV) (for intermittent vibration) above which adverse comment is likely to occur in residential properties.

Assessment Methodology and Significance Criteria

10.46. Modernisation of the Mount Pleasant Sorting Office is currently underway and it is anticipated that these works will be completed prior to the demolition and construction works commencing for each of the Development Scenarios. Consequently, this Chapter considers the assumed 'future' baseline conditions of the Site, whereby it is assumed that intensification of the Sorting Office is complete and fully operational.

10.47. Contact was made with both LBI and LBC, and requests made for consideration and feedback on any specific matter or approaches to be adopted in undertaking this assessment. At the time of writing this Chapter no formal responses had been received.

Baseline Noise and Vibration Surveys

10.48. To enable assessment of noise and vibration effects upon the Site and also of the three Development Scenarios upon noise sensitive surrounding receptors, a series of baseline surveys were undertaken. It was identified that there were three key noise and vibration considerations where the baseline condition needed to be established:

- Noise levels created by specific activities associated with the operation of the adjacent Mount Pleasant Sorting Office. This includes the loading and unloading of Royal Mail vehicles and their movement around the facility;
- Ambient noise levels affecting the suitability of the Site and noise sensitive receptors surrounding the Site. This would inform the design of the new building envelopes and the ventilation strategy at a later stage; and
- Background noise levels in the local surroundings, to enable an assessment of noise from each of the Development Scenarios, particularly new building services plant on neighbouring properties.

Site Noise Survey

10.49. To determine how noise from activities within the service yard would influence the design of the proposed residential buildings, a fixed noise monitor was located close to the loading docks and main internal roadways, as indicated in Figure 10.1.

10.50. The fixed monitor was in place from the 21st January until the 26th January 2010. A survey period of six days provided an indication of how the noise environment in the service yard fluctuates and also provides insight into typical noise profiles throughout day and night-time periods.

10.51. Supplementary measurements were recorded for periods of 15 minutes at the service yard fixed monitor location. This provided a typical noise frequency spectrum shape for the noise levels recorded.

10.52. Further measurements of isolated vehicle noise events were recorded. These provide an indication of vehicle movements that are likely to be the cause the noise levels shown in fixed monitor results. To ensure typical movements were captured, this survey was carried out during both early morning and evening peak vehicle movement periods.

Road Traffic Noise Survey Surrounding the Site

10.53. Fixed position noise monitors recorded contiguous 5 minute samples at three locations shown in Figure 10.2, from 21st to 31st January 2011. The fixed monitor sites were chosen as they provide results that are representative of ambient noise that would effect on the various residential façades proposed.

10.54. To provide additional information on the characteristics of the sound being recorded by the fixed monitors, supplementary measurements were taken at each location. This provided an indication as to the frequency spectrum of sound being recorded and can be used for façade design at a later date.

10.55. Additional verification measurements were carried out in August 2012 which confirmed there had been no noticeable change in noise levels since the original comprehensive noise survey undertaken in 2011.

Background Noise Level Survey

10.56. The background noise parameter describes the prevailing underlying noise level at the Site. As a statistical definition, it is the sound pressure level which is exceeded for 90% of a given measurement. Typical sources include distant road traffic, nearby road ways with constant vehicle streams and steady state noise sources such as external mechanical plant equipment.

10.57. Background levels are primarily measured to assess the effect of noise generated by mechanical plant associated with a development on sensitive neighbours.

10.58. The noise levels were measured at the three fixed position noise monitors that were also used in the previously discussed road noise survey. These fixed monitors recorded contiguous 5 minute samples at three locations shown in Figure 10.2, from 21 to 31 January 2011.

10.59. The fixed monitor sites were chosen as they provide results that are representative of background noise at neighbouring sensitive façades.

Vibration Survey

10.60. Acknowledging the proximity of the London Underground Metropolitan Line which runs beneath Farringdon Road and that Farringdon Road carries Heavy Good Vehicles (HGV's) through the day and night time, a series of vibration measurements were made at the Site boundary along Farringdon Road on 23 August 2012. A further check of the baseline groundborne vibration level was made at a distance of approximately 10m back from the Farringdon Road boundary along Calthorpe Street.

10.61. Vibration through building structure can also manifest as re-radiated noise. Re-radiated noise levels into the building must be estimated based on raw measured vibration acceleration levels at ground surface. Using the measured free field vibration levels a correction is made for attenuation and amplification factors to predict the level of vibration actually affecting the Site as shown in Table 10.1 below:

Table 10.1: Transfer Functions from Free Field Vibration Levels

Transfer medium	Amplification/attenuation factors
Substantial Piled / Raft Structure	-15dB
Reduction per Floor	-3dB
Worst-case Amplification due to Concrete Floor Resonance	+5dB

10.62. These amplification and attenuation factors are derived from the references shown below and are consistent with measured results for similar schemes where re-radiated noise was identified.

- ANC (The Association of Noise Consultants) Measurement and Assessment of Groundborne Noise and Vibration[29] ;
- Bies & Hansen Engineering Noise Control (Second Edition) Transportation[30];
- Proceedings of Inter Noise 1993 (R J Greer) AEL Methodology for the prediction of re radiated noise in residential buildings from trains travelling in underground tunnels[31]; and
- Noise Reference Book, Paul Nelson (editor), 1978, Butterworths[32].

10.63. The values are then applied to two methods of prediction of the resultant sound level due to re-radiated structure-borne noise.

Noise and Vibration Survey Equipment

10.64. Equipment details are summarised below:

- Sound level meter: Rion NL-32 Sn: 01161938;
- Sound level meter: Rion NL-31 Sn 841830;
- Sound level meter: Rion NL-28 SN 1260200;
- Sound level meter: Bruel & Kjaer Sn 2447600; and
- Sound and vibration analyser: Svantek Sn 6751.

Noise Modelling

10.65. In addition to measurement of the baseline situation to enable assessment, a three dimensional noise model has been constructed to aid the understanding of the variability of noise level exposure throughout the Site with the buildings in place providing shielding effects. This information has been used at an early stage to inform of the implications of noise for the design of the buildings, particularly on the likely specification of facades of also for the ventilation strategy.

10.66. The programme used for the modelling process was Datakustik GmbH Cadna-A Version 3.5.115 using the Calculation of Road Traffic Noise (CRTN) calculation method.

10.67. The model was calibrated with respect to the results of the noise measurements around the Site with adjustment as appropriate for future traffic changes.

10.68. A three dimensional computer model was also developed to better understand the projection of noise generated by HGVs and other vehicles at the entry / exit point of the tunnel access to the Royal Mail Group (RMG) basement from Farringdon Road to surrounding receptors. It also

enabled analysis of the potential effect of introducing acoustic absorption treatment to control noise build up in the tunnel. The programme used for the modelling process was also Datakustik GmBH Cadna-A.

Noise from Demolition and Construction

10.69. Construction noise and vibration is temporary and cannot be assessed in the same way as more permanent operational effects. BS 5228-1 indicates a number of factors that are likely to affect the acceptability of construction noise including site location, existing ambient noise levels, duration of Site operations, hours of work, attitude of the site operator and noise characteristics of the work being undertaken.

10.70. BS 5228-1 informative Annex E provides example criteria that may be used to consider the effect significance of construction noise. The criteria do not represent mandatory limits but rather a set of example approaches intended to reflect the type of methods commonly applied to construction noise. The example methods are presented as a range of possible approaches (both façade and free field noise levels, hourly and day-time averaged noise levels) according to the ambient noise characteristics of the area in question, the type of development under consideration, and the expected hours of construction activity. In broad terms, the example criteria are based on a set of fixed limit values which, if exceeded, will result in a significant effect unless ambient noise levels (i.e. regularly occurring levels without construction) are sufficiently high to provide a degree of masking of construction noise.

10.71. Based on this guidance and given the existing ambient noise levels present at the Site, which were determined during the baseline survey described later in this Chapter, the following threshold criteria values are considered relevant to the assessment:

- Day-time week-days (07:00 to 19:00) and Saturdays 07:00 to 13:00: 75dB $L_{Aeq,T;}$
- Night time (23:00 to 07:00): 55dB $L_{Aeq,T;}$ and
- Evening and week-ends (remaining periods): 65dB $L_{Aeq,T.}$

10.72. $L_{Aeq,T}$ levels correspond to free-field day time noise levels occurring over the relevant time period T. Noise levels at noise-sensitive receptors above the criteria can be considered as a ‘moderate adverse effect’ if the activity is for a short duration (a few weeks), or a ‘substantial adverse effect’ if noise levels continue above this limit for a prolonged period. Noise levels below the criteria will be considered a ‘minor’ effect, or ‘negligible’ effect if more than 10dB below the criteria.

Vibration from Demolition and Construction Activities

10.73. Piling operations during the early phases of the construction present the possibility of vibration effects to surrounding properties. Other construction activities are unlikely to generate significant levels of vibration at the nearest sensitive locations.

10.74. There is no ratified UK prediction method for predicting actual ground vibration levels that may be expected in practice. This is in part due to the inherent complexities and uncertainties associated with ground vibration prediction, in terms of input source values, propagation uncertainties (significantly affected by the specific composition and structure of the ground between the source and receiver) and the dynamics of the receiver location.

10.75. To evaluate the likely significance of these effects, reference is made to BS 5228-2. The standard provides guidance on the effect of vibration on humans, as shown below in Table 10.2 in terms of Peak Particle Velocity (PPV) along with the proposed significance criteria for assessment. The standard also presents factors to be considered when setting appropriate vibration limits for

the avoidance of structural damage, indicative vibration levels derived from case studies of various piling techniques, and the types of measures that can be employed to reduce vibration levels.

Table 10.2: Guidance on the Effects of Construction Vibration Levels

Vibration level (PPV)	Description	Significance criteria
0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction.	Negligible
0.3 mm/s	Vibration might be just perceptible in residential environments.	Minor
1 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.	Levels of between 0.3 and 1 mm/s shall be deemed moderate. Above 1 mm./s shall be Major
10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.	Substantial

10.76. BS5228-2 states in Annex B that '*extensive studies carried out in the UK and overseas have shown that documented proof of actual damage to structures or their finishes resulting solely from well-controlled construction and demolition vibrations is rare*.' The standard further notes that '*in some circumstances, however, it is possible for the vibrations to be sufficiently intense to promote minor damage. Typically this damage could be described as cosmetic and would amount to the initiation or extension of cracks in plasterwork etc. rather than the onset of structural distress.*'

10.77. However, the levels above which cosmetic damage could occur (50 mm/s (PPV) for reinforced or framed structures, and 15 mm/s for light-framed structures) are significantly higher than the values for human reaction to vibration given in Table 10.2. Consequently, the latter will be referenced when considering the effects of construction vibration.

Operational Traffic Noise

10.78. Changes in noise levels attributed to changes in road traffic flows resulting from each of the Development Scenarios have been calculated using traffic data provided by SKM Colin Buchanan in accordance with CRTN. Noise levels were calculated for the roads in the vicinity of the Site and surrounding noise sensitive receptors. The calculations used the 18-hour Annual Average Daily traffic (AADT), HGV compositions and vehicle speed for each road.

10.79. Guidance on the assessment of potential effects from operational traffic noise is provided within the IEMA Guidance Note No. 1 'Guidelines for the Environmental Assessment of Road Traffic'. The Guidance Note recommends assessment where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%), and where specifically sensitive areas experience traffic flow increases of 10% or more. The Guidance Note indicates that projected changes in traffic, above or below the baseline, of less than 10% create no discernible environmental effect.

10.80. The criteria for the assessment of traffic noise changes arising from each of the Development Scenarios have been adapted from the Joint IEMA and the Institute of Acoustics (IoA) draft guidelines for noise effect assessment categories and are given in Table 10.3 below. A 3dB (A) change is commonly regarded as the smallest subjective difference in noise level discernible in standard conditions.

Table 10.3: Criteria for Effect of Changes of Traffic Noise from each of the Development Scenarios

Category	Noise change band	Description
Negligible Effect	<3dB(A)	Not discernible – Marginal changes in noise levels of less than 3dB(A) in residential areas or outdoor recreational areas in close proximity to main roads
Minor Effect	3 to <5dB(A)	Adverse – Noise levels of 3 to 5dB(A) in residential areas or at outdoor recreational areas Beneficial – Reductions in noise level of 3 to 5dB(A) at residential communities
Moderate Effect	5 to <10dB(A)	Adverse – Noise level warrants mitigation of residential properties on a widespread basis in a community, or where outdoor recreation areas close to roads may be inappropriate Beneficial – Where reductions in noise level of more than 5dB(A) at residential communities or more than 10dB(A) at small groups of housing occur
Substantial Effect	10 to <15dB(A) or more	Adverse – Noise increases to a level continued residential use of individual properties is inappropriate or where the use of community building could be inappropriate Beneficial – A reduction of traffic noise to a level where it does not have a significant influence on the ambient noise in the area

Ambient Internal Noise within the Development Scenarios

10.81. LPAs throughout the UK commonly recognise that development in urban areas will, as a consequence of transportation access demands, be subject to noise; particularly from roads. In response to this the general principle is for LPAs to stipulate that these external noise levels are reduced inside habitable rooms to levels which allow for rest and sleep.

10.82. BS 8233 provides guidance on suitable internal noise levels for dwellings, which are generally in line with guidance based on research by the World Health Organisation (WHO). LBI and LBC require internal noise standards for residential buildings which derive from the advice in BS 8233. Table 10.4 below sets out both the guidance range indicated by BS 8233 and the LBC and LBI internal noise standards for dwellings.

Table 10.4: Noise Intrusion Criteria

Area	Time (T)	Internal noise level		
		Noise unit	BS 8233 Guidance	Local requirements
Living rooms	Day (07:00 – 23:00)	$L_{Aeq,T}$	30 - 40	< 35
Bedrooms	Night time (23:00-07:00)	$L_{Aeq,T}$	30 - 35	< 30
		$L_{Amax(fast)}$	45	< 45
Offices	Day	$L_{Aeq,T}$	40 - 50	-

10.83. These internal noise standards include for normal occurring noise such as road traffic and general street activity but exclude occasional emergency vehicle sirens and alarms, and military aircraft operations.

10.84. BS 8233 also offers guidance on the typical levels of sound reduction that can be expected for different types of façade solution. It also provides a calculation method for determining levels of noise intrusion through a façade. In combination it is therefore possible to assess the suitability of a relatively conventional facade system with respect to the level of noise exposure for a particular site and to then go further to determine the necessary uplift in sound reduction performance that would be needed to achieve control of the external noise level down to the ideal internal standards as set out above.

10.85. The significance of noise intrusion levels will be assessed on a compliance/non-compliance basis. An assessment will be made as to whether the levels of external noise can be reduced with a practical façade system to the ideal internal noise standards. Non-compliance will result in a substantial adverse effect, whereas compliance will result in a negligible effect.

Ambient Vibration: Effect on Humans in Buildings

10.86. BS 6472:2008(1) describes an approach for assessing vibration within a building against criteria for human response. The VDV is used in quantifying the effect of multiple occurrences of a discrete vibration event within a given time period. This assessment compares the VDV to the criteria weighted for residential buildings. The criteria are given as levels of 'satisfactory vibration magnitudes' and are specified in the horizontal and vertical axes on the floor. Separate criteria are defined for different space usage. Vertical axes data are presented here because these are the dominant vibration magnitudes.

10.87. Rail traffic vibration is considered to be intermittent. Intermittent vibration is assessed using the vibration dose concept on residential premises which relates vibration magnitude to exposure time. Relevant multiplying factors are used to derive acceptable magnitudes of vibration on the basis of the receiver type, i.e. office or retail.

10.88. BS 6472:2008(1) describes the calculation of the VDVs from the measurements of vibration acceleration between 1 and 80Hz. The eVDV is the level of vibration normalised to a one second period that is of equal severity to the measured vibration over the entire period of the event. This is used to assess the severity of vibration from a number of events. The criteria for assessing VDVs correspond to the probability of adverse comments as shown in Table 10.5 below. Also indicated are the associated significance criteria to be used for the assessment of effect.

Table 10.5: Vibration Dose Assessment and Effect Significance Criteria

Location	Time	Low probability of adverse comment ($m/s^{1.75}$)	Adverse comment possible ($m/s^{1.75}$)	Adverse comment probable ($m/s^{1.75}$)
Residential	Day (07:00 to 23:00)	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential	Night time (07:00 to 23:00)	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8
Office /Retail	Day (07:00 to 23:00)	0.4 to 0.8	0.8 to 1.6	1.6 to 3.2
Significance criteria		**Adverse minor**	**Adverse moderate**	**Adverse Substantial**

10.89. Vibration levels below the 'Low probability of adverse comment' are deemed to have a negligible effect.

Vibration Induced Noise Effect

10.90. Groundborne vibration can manifest as re-radiated airborne noise. Although there is no UK standard that deals with groundborne noise assessment in buildings, Table 10.6 below summarises the key available guidance criteria.

Table 10.6: Re-radiated Noise Guideline Criteria

Source	Location	Guideline	Magnitude of impact
Local Authority (UK) Guidelines	Channel Tunnel	35dB $L_{Amax(fast)}$	None stated
London Under Ground Ltd Studies	Victoria Line	40dB L_{Amax}	None stated
APTA Guidelines	USA Railways	35dB L_{Amax}	None stated
FTA Guidelines	USA Railways	25 to 35dB L_{Amax}	None stated
HS1 (As outlined in ANC Guidelines)	UK	35 – 39 $L_{Amax,s}$	Low
		40 – 44 $L_{Amax,s}$	Medium
		45 – 49 $L_{Amax,s}$	High
Crossrail (As outlined in ANC Guidelines)	UK	35 – 39 $L_{Amax,s}$	Low
		40 – 44 $L_{Amax,s}$	Medium
		45 – 49 $L_{Amax,s}$	High

10.91. According to BS 8233 maximum short duration noise events within bedrooms should be below 45dB L_{Amax} (fast) due to individual noise events as a reasonable standard.

10.92. In the UK, criteria of 40dB L_{Amax} (slow) for residential properties and 40 to 45dB L_{Amax} (slow) for office properties (depending on the sensitivity of the office type) are commonly used for assessment and were adopted for the assessment described in this Chapter.

10.93. The significance of re-radiated noise intrusion levels resulting from groundborne vibration was assessed with respect to the stated guideline criteria. Non-compliance with the guide criteria would result in a substantial adverse effect, whereas compliance would result in a negligible effect.

Building Services Plant Noise

10.94. It is common to apply a threshold exceedence limit for the introduction of plant associated with new developments, which is generally set a level below the existing background noise level in the noise sensitive areas. This is in line with the assessment methodology provided in BS4142. The general principle of the BS4142 assessment criteria is that noise nuisance can be avoided provided there is no significant change in the prevailing background noise conditions at any surrounding noise sensitive premises once the new equipment is operational.

10.95. The BS4142 assessment criteria explicitly designate that where the specific noise level of the new plant is 10dB above the background noise level, complaints are likely. Where the new noise is 5dB above the background noise level, it is considered to be of marginal significance. Where the noise level of the plant is 10dB below background noise, the standard states that this is a positive indication that complaints about noise should not occur.

10.96. LBC and LBI adopt this principle, requiring that noise from any new building services plant is controlled to a level of between 5dB(A) and 10dB(A) below the minimum measured background noise level at the nearest noise sensitive premises, depending on local circumstances. Additionally, it is stated that where noise emitted from the development will contain tones or will be intermittent sufficient to attract attention, a 5dB penalty should be applied to the criteria (in accordance with BS 4142).

10.97. For testing of emergency generation plant, for no more than 1 hour per month between 09:00 and 17:00 during working weekdays, it is common protocol, though not formally documented in local policy that the criteria are relaxed to correspond to an increase in the minimum background noise levels by no more than 10dB(A).

10.98. The significance of noise from new plant was assessed on a compliance / non-compliance basis. Non-compliance would result in a substantial adverse effect, whereas compliance would result in a negligible effect.

Noise in Proposed Courtyards

10.99. In addition to the indoor acoustic conditions, there are numerous policies including those set out in the London Plan which require that consideration must also been given to the impact of noise upon external amenity areas and also the effect of noise generated with these spaces on the enjoyment and amenity for future residents overlooking the areas.

10.100. In terms of the ambient noise level within the proposed spaces, guidance can be taken from BS 8233 and WHO on appropriate levels. In respect to the activity noise generated within the proposed courtyards and the potential effect this could have on surrounding residents, there is no established method of assessment. Part E of the Buildings Regulations does however make reference to the impact of noise from circulation areas on occupants, and requires that to overcome the shortfall of the entrance door to accommodation, the reverberation of the common areas should be controlled to limit noise build up.

Future Baseline Conditions

10.101. This Chapter considers the assumed ‘future’ baseline conditions of the Site, whereby it is assumed that intensification of the Mount Pleasant Sorting Office is complete and fully operational.

Overview of Current Local Noise Conditions

10.102. The external ambient noise environment is currently affected by a combination of sources, but primarily road traffic vehicles on surrounding roads which includes movement of vehicles entering and exiting the Mount Pleasant Sorting Office. Commercial aircraft movements are noticeable throughout the daytime periods but with aircraft flying at a relatively high altitude, noise levels are relatively low compared to road traffic noise.

10.103. Farringdon Road (A201) is a busy A-road with high volumes of traffic, including buses and other heavy goods vehicles. Calthorpe Street and Phoenix Place have significantly less vehicle traffic than Farringdon Road, and only on occasion have vehicles larger than private passenger cars. These would typically be small lorries used for delivery purposes or carrying small external loads.

10.104. Royal Mail vehicle movements represent the main source of ambient and maximum noise generation within the Site which includes occasional sound from safety reversing alarms. Vehicles on the Site include articulated lorries, other lorries, vans and light vans.

10.105. A typical daytime vehicle movement around the Site would be to enter from Farringdon Road and travel to the vehicle depot on the below ground bathtub area or in a dock on ground level. To leave the Site vehicles move along internal road ways, up and down ramps, and exit at either the Farringdon Road or Phoenix Place gates. Vehicle engine noise due to accelerations is a noticeable characteristic of the Site noise environment. In particular is the distinct 'clatter' of diesel engines which are installed in most Royal Mail vehicles. Noise emission from the Site at the boundary are however only just audible within the masking from the general road traffic noise, from primarily Farringdon Road.

10.106. Articulated lorries follow the same route around the Site as the smaller vehicles discussed above, however they only load and unload at the main docks adjoining the north-west façade of the Mount Pleasant Sorting Office. The standard procedure for entering the dock involves the unit reversing the trailer into the dock and decoupling. During this process there may occur revving noises from the engine and also reversing signals. Once docked, the unit will shut down and may release air; creating a short burst of noise.

10.107. Due to operational reasons, some of the articulated lorries do not enter the docks straight away and instead idle in the yard; such events were observed to be up to 5 minutes in duration.

10.108. There are many short-term noise sources around the Site which do not occur often compared to noise generated by vehicle drive systems. These include reversing signals, mail trolleys banging / rattling and workers talking / shouting.

10.109. External mechanical plant noise on the Site was only observed from a loose belt on a boiler located at the western corner of the Mount Pleasant Sorting Office. We have been advised that this belt is in the process of being replaced and therefore would not be a permanent noise source. Therefore this source of noise is excluded from further assessment.

Changes to Current Local Noise Conditions

10.110. There are two key changes that can be expected in the local noise conditions as a result of the intensification of the adjacent Mount Pleasant Sorting Office;

- Changes in road traffic noise due to changes in traffic flows on surrounding roads; and
- Change in emissions of on the Site generated noise due to enclosure of the service depot.

10.111. Current ground borne vibration levels are not expected to change as a result of these changes although consideration is given later in this Chapter to the potential effect of noise and vibration transfer through the structure from the covered depot to the residential accommodation.

10.112. The following sections describe the assumed future baseline conditions including for changes resulting from variations in traffic movements and the difference in noise emissions from the existing vehicle service due to the covering over of the service depot and docking bays.

Ambient Noise Levels Surrounding the Site

Current Levels of Ambient Noise

10.113. Ambient noise at the boundaries of the Site are dominated by road traffic noise. Levels of road traffic noise were measured around the Site at multiple positions as shown in Figure 10.2. Table 10.7 presents the range of day and night time ambient noise levels for the three locations.

Table 10.7: Day and Night Time Long -term Ambient Noise Levels

Fixed monitor location	Period	Data Range (dB)
Farringdon Road	Daytime ambient noise level ($L_{Aeq,16\ hour}$)	69 to 71
	Night time ambient noise level ($L_{Aeq,8\ hour}$)	66 to 67
Calthorpe Street	Daytime ambient noise level ($L_{Aeq,8\ hour}$)	60 to 63
	Night time ambient noise level ($L_{Aeq,8\ hour}$)	55 to 58
Phoenix Place	Daytime ambient noise level ($L_{Aeq,16\ hour}$)	56 to 63
	Night time ambient noise level ($L_{Aeq,8\ hour}$)	54 to 60

10.114. Full graphical traces of all fixed monitor results are given in Figures 10.3 to 10.5.

10.115. Both day and night time noise levels at Farringdon Road have range of 2 dB for the duration of the survey. This indicates that the noise levels at this location are very consistent for each day and night time period. The minor reduction in noise levels between day and night time periods is due to reduction in traffic volumes.

10.116. Noise levels recorded at Calthorpe Street are characteristic of a lower vehicle volume road where not only are the day / night time levels lower than Farringdon Road, but there is a trend for the average night time levels to reduce significantly from the average day time levels, as the number of vehicle movements are reduced.

10.117. Noise levels at the Phoenix Place entry gate are similar to those at Calthorpe Street. It should be noted that vehicle movements were observed to be lower on Phoenix Place compared to Calthorpe Street. The ambient noise results at the Phoenix Place monitoring location were influenced by vehicle movements within the Mount Pleasant Sorting Office. Evidence for this is the larger range of both day and night time levels in Table 10.7 above and also that the difference between day and night time levels is less than Calthorpe Street. The small difference between day and night time levels is likely to be caused by vehicles exiting through the eastern gate through the night time, increasing noise levels for this period. Additional evidence for the influence of on Site Royal Mail vehicles noise, is shown in Figures 10.4 and 10.5 where the typical day / night time periods are very similar for all days in the Farringdon Road and Calthorpe Street traces, but are not so for Phoenix Place, which has a typical plot for the week days only (weekend being 29th and 30th January).

10.118. Supplementary measurements were recorded for periods of 15 minutes at the three fixed monitor locations discussed above. This provided a typical noise frequency spectrum shape for the noise levels recorded by the fixed monitors. These are presented in Figures 10.6 to 10.8.

10.119. Maximum night time noise levels are of significance when designing residential buildings. Figures 10.3 to 10.5 displays a typical night time history of maximum noise levels at the existing Calthorpe Street site boundaries.

Future Baseline Traffic Noise Changes

10.120. Traffic flows provided by the project Traffic Consultant indicate a change in flows with the intensification works to the Mount Pleasant Sorting Office. As a consequence, consideration has been given to the noise level change as described above when the reconfigured facility would be fully operational.

10.121. Basic noise levels for the all roads were calculated according to CRTN using annual average daily traffic flows (AADT) to quantify change levels. Note that these noise levels are not the absolute noise level at the façades of properties and no situation-specific corrections were applied to the basic noise such as distance from the centreline of the road, reflection effects which already occur, or angle of view. Rather the aim was to establish a benchmark to then enable future change comparisons to be made. Table 10.8 summarises the results of the calculated noise levels (L_{A10}) for all surrounding roads.

Table 10.8: Calculated Basic Noise Levels for Surrounding Road (in accordance with CRTN)

Basic Noise Level	2012	Future baseline	Difference
Link 1 – Calthorpe Street	64.8	64.9	0.1
Link 2 - Coley Street	55.6	55.7	0.1
Link 3 - Farringdon Road	71.3	71.4	0.1
Link 4 – Mount Pleasant	59.6	60.0	0.4
Link 5 - Phoenix Place	60.0	60.7	0.7
Link 6 - Rosebery Avenue	66.5	66.7	0.2
Link 7 –Gough Street	53.9	54.1	0.2

10.122. The assessment of traffic flow changes on the surrounding roads with the Sorting Office works complete indicates slight increases in noise levels but as defined in Table 10.3 earlier, this would be deemed a negligible change. A difference of less than 3 dB is generally indiscernible; all changes in basic noise level due to traffic flow are less than 1 dB.

10.123. Whilst only slight changes are predicted consideration was given to the difference in noise level for the future baseline for the current conditions.

Phoenix Place Noise Level Monitoring Checks

10.124. It is noted in the preceding section that the long term noise monitoring of ambient noise carried out along Phoenix Place was likely to have been influenced to an extent by local RMG vehicle movements, mainly delivery van egress from the eastern gate. The range of daytime ambient noise level was 56 to 63 $L_{Aeq,16\ hour}$. This is a wider range than other roads, but the subjective impression from observing the average level of noise along the road was that it was not as high as Calthorpe Street, even though the upper levels in both range were the same at 63 dB $L_{Aeq,16\ hour}$.

10.125. A further check of noise levels along Phoenix Place was made on 9th January 2013 during the afternoon. The aim of the exercise was to verify the typical levels of noise at different points along the road away from the eastern gate where the long term monitor had been set up originally, and also to understand the effect of the contribution of RMG vehicle on the ambient noise along the road, to effectively gain a picture of the future baseline situation by measurement without vehicles. During samples over relatively short periods, typically 10 minutes, it was determined that noise levels during the afternoon hours were 59 to 62 dB L_{Aeq}. In a series of samples, the pause function available on the instrument was used to omit noise from RMG vehicles. It was determined that noise levels without RMG vehicle contributions did not exceed 60 dB L_{Aeq}.

Emissions of On-Site Generated Noise to Surroundings

10.126. It was recognised at the early design stage that noise generated on the Site, largely from vehicle movements would need to be considered, particularly in view of the intention to remodel the service depot into an area which would be overlooked by new residential accommodation. Hoare Lea Acoustics were consulted on the implication of noise and worked in conjunction with the design team on developing solutions which were then discussed in some detail with the LPA.

Existing On-Site Noise Levels

10.127. The level of noise generated within the external service depot areas of the Sorting Office was established by a series of measurements.

10.128. A typical day / night time noise profile, as recorded by the fixed monitor, is displayed in Figure 10.9. The ambient (L_{Aeq}) and maximum (L_{Amax}) noise parameters plotted are descriptors used for determining the effect of environmental noise on residential developments. A graphical trace of all survey data measured by the fixed monitor is presented in Figure 10.10.

10.129. Figure 10.11 presents the results of the individual noise event measurements. Events were measured at various distances from the microphone. Therefore, in order to enable direct comparison of the results, they have each been normalised to a 'reference' distance of 10m.

10.130. Vehicle movements are the main source of noise on the Site, with noise levels typically ranging from 65 to 75dB L_{Aeq} at 10m. The variation between lorry and van samples is generally attributable to the size of the vehicle, speed and engine power, all of which are indicated by trends in the Figure 10.11 data.

10.131. The highest ambient noise level measured was 77dB L_{Aeq} at 10m, caused by an articulated lorry engine as it was leaving the loading dock. It was observed that the maximum noise level event occurred when the engine was at its highest Revolutions Per Minute (RPM), before changing gear, as it pulled away from the dock.

10.132. Maximum noise levels were found to be in the range of 70 to 90dB L_{Amax} between 24:00 and 06:00, after which there is a slight increase in the average level recorded. The highest maximum noise levels are likely to be caused by the loudest individual vehicle movements.

10.133. There was a minimal difference in data for the ambient daytime 16 hour levels compared to the 8 hour night time levels. This can be attributed to the 24 hour operation of the adjacent Mount Pleasant Sorting Office with background ambient contribution from Farringdon Road, which also has consistent noise levels through the day and night-time.

Background Noise Levels Survey

10.134. The baseline background noise level were measured prior to the modernisation works of the Mount Pleasant Sorting Office, primarily in preparation to set limits of noise emission for any new plant associated with the Development Scenarios so as to protect the amenity of surround noise sensitive receptors in accordance with the LPA policies. Figure 10.12 presents the sensitive façade lines which are coloured to correspond to fixed monitors that recorded background noise levels that are likely to be expected at those façades. Note that the Phoenix Place façade lines, shown in yellow, do not currently exist.

10.135. Minimum background levels at each fixed monitor location are presented in Table 10.9 below.

Table 10.9: Minimum Background Noise Levels

	Fixed Monitor Location	Farringdon Road	Calthorpe Street	Phoenix Place
Minimum background noise levels (dB L_{A90})	Daytime (07:00 to 19:00)	51	45	46
	Evening (19:00 to 23:00)	52	45	45
	Night time (23:00 to 07:00)	44	39	42

10.136. Table 10.9 shows the variation in background noise around the Site perimeter. It is clear that constant high traffic levels on Farringdon Road during the daytime and evening periods increase the background noise compared to the other roads surrounding the Mount Pleasant Sorting Office.

10.137. During the night time period all three fixed monitor locations recorded similar reductions in levels compared to daytime and evening periods. This is most likely due to reductions in vehicle numbers on Farringdon Road, which control background levels around the Mount Pleasant Sorting Office.

10.138. It is noted that, following the intensification works to the Royal Mail Sorting Office, predictions indicate a slight increase in the level of background noise due to traffic flow changes on surrounding roads. The difference between current and the future situation is expected to be less than 1 dB. However, it would be recommended that further verification measurements of background noise are made prior to setting limits which will inform the selection and design of new building engineering services plant for the Development Scenarios.

Vibration Levels

10.139. Observations during the measurements considered the main source of ground vibration excitation to be due to movements of HGV's on Farringdon Road. No other noticeable short-term increases in vibration level were noticed, thereby suggesting there to be negligible contribution at the measurement point from underground train movements.

10.140. Table 10.10 summarises the highest measured VDV for the day time and night time periods. No amplification or damping factors have been applied on the assumption of ground surface contact with building structure.

Table 10.10: VDVs Established from Measurement at Ground Surface

Period	VDV [$m/s^{1.75}$]
Daytime (07:00 to 23:00)	0.36
Night time (23:00 to 07:00)	0.25

10.141. Re-radiated noise levels into the building have also be estimated based on raw measured vibration acceleration levels at ground surface. Table 10.11 summarises the upper measured result and a typical level.

Table 10.11: Measured Acceleration Data at Ground Surface

	Un-weighted acceleration (m/s^2)
Upper level	0.004
Typical level	0.003

10.142. The results of the various methods of calculating re-radiated noise levels for new dwellings at the boundary with Farringdon Road, using the typical to upper measured free field vibration data, are summarised below in Table 10.12

Table 10.12: Predicted Structureborne Re-radiated Noise Levels dB (A)

Event	Method	
	ANC	Bies & Hansen
Low amplification	31-34	30-33
High amplification	36-39	35-39

Potential Effects

Demolition and Construction

Noise - Development Scenarios 1, 2 and 3

10.143. The potential effects of noise from demolition and construction activities is assessed with respect to absolute levels as guided within BS 5228 rather than current or future baseline noise levels.

10.144. A schedule of potential noise levels emanating from the Site as a result of demolition and construction activities of each Development Scenario was produced to provide an objective illustration of the potential levels of noise arising from particular construction activities that would occur in relation to each Development Scenario at various times throughout the demolition and construction works. A range of distances from 25m to 100m for the various activities and sources of noise were considered. This outline assessment includes for high noise output operations that occur at ground level, such as demolition and excavation, as well as miscellaneous sources of noise, which would likely be representative of the activities used in the construction of each of the Development Scenarios. Source levels were based on the data provided in BS 5228-1 for a range of typical construction activities, these being based on extensive tests on construction sites.

10.145. Existing noise-sensitive locations close to the Site include residential properties on Calthorpe Street, Mount Pleasant and on the opposite side of Farringdon Road. There is also a hotel on Calthorpe Street opposite the Calthorpe Street site. Since the Development Scenarios would likely be constructed in successive phases (as shown on Figure 6.1), predictions associated with typical construction activities were undertaken at standard distances from the source of noise at 25m, 50m and 100m, to represent the construction noise effect on different receptors (both the existing receptors identified as well those in the completed Development Scenarios), rather than considering one specific noise receptor. The intention here is to gain an indication of the likely levels of construction in all surrounding areas in relative proximity to future building works so as to enable assessment of likely impact and determine the need for specific mitigation.

10.146. Table 10.13 sets out key activity noise levels for typical construction equipment and for varying percentage time periods of a working day. All predictions are made on the basis of an unobstructed line of sight from the construction noise source, and using ‘point source’ propagation characteristics.

Table 10.13: Upper Predicted Noise Levels for Typical Site Activities at Varying Distances

Activity	Typical Equipment	Quote Noise Rating LAeq dB at 10m	% On Time	Predicted Receiver Noise Levels Laeq (Db) For A Working Day Period At Varying Distances		
				25m	50m	100m
Breaking up concrete	Breaker mounted on wheeled backhoe	92	75	83	77	71
	Pulveriser mounted on excavator	72 to 80	75	63 to 72	57 to 63	51 to 59
Dumping brick rubble	Tracked excavator loading dump truck	85	30	72	66	60
Crushing concrete / rubble	Tracked crusher	82 to 84	30	69 to 71	63 to 65	57 to 59
Clearing site	Tracked excavator	70 to 78	75	61 to 69	55 to 63	49 to 57
Ground excavation / earthworks	Dozer or Tracked excavator	69 to 81	75	60 to 72	54 to 66	48 to 60
Loading lorries	Wheeled loader	76 to 80	50	65 to 69	59 to 63	53 to 57
Distribution of material	Dump trucks tipping fill	74 to 79	50	63 to 68	57 to 62	51 to 56
Pre-cast piling - hydraulic hammer	Hydraulic hammer rig	89	50	78	72	66
Tubular steel piling - hydraulic hammer	Hydraulic hammer rig	77 to 88	50	66 to 77	60 to 71	54 to 65
	Drop hammer pile rig power pack	69	50	58	52	46
Sheet steel piling - hydraulic jacking	Piling or Power pack	59 to 68	50	48 to 57	42 to 51	36 to 45
Rotary bored piling – cast in situ	Large rotary bored piling rig Tracked drilling rig with hydraulic drifter Mini piling rig	75 to 83	50	64 to 72	58 to 66	52 to 60
Craneage for piling	Mobile crane	67 to 70	50	56 to 59	50 to 53	44 to 47
Cutting steel piles	Gas cutter	65 to 68	25	51 to 54	45 to 48	39 to 42
Mixing and pumping concrete	Mixer truck and pumping	75 to 80	50	64 to 69	58 to 63	52 to 57
Concreting	Vibrators and placing boom	65 to 78	50	54 to 67	48 to 61	42 to 55
Lifting	Mobile telescopic crane Tracked mobile crane	67 to 83	25	53 to 69	47 to 63	41 to 57
Power for site cabins	Diesel generator	56 to 74	100	48 to 66	42 to 60	36 to 54
Miscellaneous	Angle grinder	80	50	69	63	57
	Handheld cordless nail gun	73	50	62	56	49

10.147. Table 10.13 demonstrates a wide range of potential activity noise levels for different operations, with noise levels varying from 36 to 83dB L_{Aeq} according to the activity under consideration, the selected type of process, and the location of the operation. It should be noted that the presented noise levels relate only to the individual noise rating of particular activities. In reality, a number of noise generating activities would simultaneously be occurring on the Site, leading to cumulatively higher noise levels (for example, three operations of equal noise level occurring on a given day would equate to a total level 5dB greater than the individual activity occurring on its own). In general, with the exception of a small number of rare very high output activities during the construction programme, operating at the closest locations to the surrounding residences, working day noise levels would generally be expected to be below 70 to 75dB L_{Aeq} (allowing for nominal cumulative increases from multiple activities).

10.148. A comparison of the predicted range of construction noise levels against the relevant 75dB $L_{Aeq,T}$ limit (for weekday and Saturday morning periods) indicates that the majority of activities would be expected to lie, or could be controlled to lie, below the criterion. The upper range of predicted values indicates that noise levels could exceed this target value, and consideration would therefore be given to appropriate construction techniques and phasing. In addition, many of the activities would exceed the criteria applicable during night time, evening and most of the weekend periods (55 and 65dB $L_{Aeq,\ T}$ respectively), so consideration is also given to the time of works (i.e. no noisy night time working).

10.149. Additional to the above which generally gives guidance on noise emission levels from on-site activities there is potential for noise from construction traffic. Traffic accessing the Site would be controlled in strict accordance with the agreed Construction Traffic Management Plans. It is anticipated that construction traffic flows could involve up to 23 vehicles per hour, although this is unlikely to repeat in every hour which could potentially see changes in traffic on Farringdon Road, Calthorpe Street, Phoenix Place, or Mount Pleasant. Analysis of the data suggests that the expected contribution of construction traffic to the main traffic flow would likely be less than 10%. IEMA Guidance Note No. 1 indicates that a change of less than 10% in traffic flow creates no discernible environmental impact and assessment is not required. However, it is acknowledged that movement of individual large vehicles can be perceived as generating high noise levels which may have a more noticeable effect than the above approach based on statistical averaging. Large vehicles can generate source noise levels in the order of 108 dB(A) (sound power level) when in motion. These types of vehicles usually pass a receiver location quite quickly. When stationary, the same vehicles will be operating in idle which significantly lowers the noise output to the environment. Based on the prediction methodology in BS 5288 and accounting for articulated lorries with a capacity of 23 tonnes and moving at an estimated 15 miles per hour, this would represent noise levels of 60 dB $L_{Aeq,T}$ at 10m and 55 dB $L_{Aeq,T}$ at 20m from the noise source. This could exceed the BS 8233 criterion of 55 dB LAeq,T applicable during the night-time, so consideration should be given to the time of traffic to the site and deliveries.

10.150. Noise effects from the demolition and construction works on the noise-sensitive receptors identified (both existing and those introduced in successive phases of the three Development Scenarios) would therefore likely be **minor** to **moderate adverse**, **temporary** and of a **local significance**, prior to mitigation, depending on the different construction activities and their distance to the sensitive receptors and hours of operation. This is applicable to each Development Scenario.

Piling Vibration - Development Scenarios 1, 2 and 3

10.151. This section describes the potential vibration levels that are predicted to arise during the demolition and construction (e.g. due to piling) phases associated with each Development Scenario. Potential effect on sensitive structures, comprising all adjacent buildings, and possible transmission through the Metropolitan Line and 'Mail Rail' tunnels beneath the Calthorpe Street site was assessed.

10.152. BS 5228-2:2009 'Code of Practice for Noise and Vibration Control on Construction and Open Sites' provides detailed guidance for the assessment of piling operations. With respect to ground vibration, the standard provides an empirical relationship for estimating potential ground vibration, but notes that the relationship tends to overestimate ground vibration levels in practice. The standard also provides measured ground vibration data for a range of different piling techniques, at different distances, in different environments.

10.153. At this stage in the design of the Development Scenarios, the specific requirement limits from piling remain to be determined. Provision for augering or bored piling categorised as vibro-driving has been assumed as worst case assumption. As a basis for predicting vibration, reference was made to the range of energy per cycle values noted for vibratory piling in the supporting Appendices to BS 5228, which span from approximately 2 to 10.7kJ.

10.154. In terms of separating distances, residential dwellings close to piling would be typically 20m away, with properties for example on the opposite side of Farringdon Road.

10.155. The following calculated levels are based on vibratory auger and bored piling to a maximum depth of approximately 32m, with a maximum energy phase of 10.7kJ. It is considered unlikely that this full force would be required at all stages of the pile being advanced, and therefore a prediction was also undertaken for the piling delivering half of this energy. The results are given in Table 10.14, which refer to vibration levels at buildings within 20m from the piling activity, which might potentially include buildings on the opposite of surrounding roads or in later phase of the building works. The results do not take any account of amplification of vibration that may occur from the outside of building to a floor structure inside the building.

Table 10.14: Predicted Maximum PPV Values for Non-Effect Vibratory Piling (assuming a worst case energy per cycle 10.7kJ) at a Distance of Typically 20m According to the Method Outlined in TRL 429 and BS 5228.

Percentage Likelihood of Exceedence	Predicted Vibratory Piling PPV mm/s	
	Steady Operation	Start-up and Run-down
33.3%	2.0	4.0

10.156. Assuming vibro piling rigs operating at full capacity, predictions suggest there is potential that vibration could be felt at neighbouring residential premises on the opposite side of the road. The predicted values are however significantly lower than the threshold for cosmetic damage to buildings.

10.157. Vibration effects from piling works on the noise-sensitive receptors identified (both existing and those introduced in successive phases of the three Development Scenarios) would therefore likely be **substantial adverse**, **temporary** and of a **local significance**, prior to mitigation, depending on the piling type and their distance to the sensitive receptors and hours of operation.

10.158. Operational mitigation, including reduced auger excitation from the maximum assumed 10.7kJ would be need to be implemented to limit the effect of piling vibration upon the nearest properties surrounding the Site.

Completed Development

Operational Road Traffic Noise - Development Scenarios 1, 2 and 3

10.159. This section reviews the potential effects of change in noise level due to changes in traffic flow on surrounding roads. These changes in noise level are later considered in assessing the likely effect of ambient noise on the Site, as required to judge the suitability of the Site for residential led development.

10.160. Basic noise levels for the all roads were calculated according to CRTN using annual average daily traffic flows. Note that these noise levels are not the absolute noise level at the facades of properties and no situation specific corrections were applied to the basic noise such as distance from the centreline of the road, reflection effects, and angle of view. Rather the aim was to establish a benchmark to then enable future change comparisons to be made. The input for the calculations comprised the annual average daily traffic flows. These are 24 hour data but the output is an 18-hour noise level (06:00-24:00) such that the results can generally be considered as a worst case indication.

10.161. Table 10.15 summarises the results of the calculated noise levels ($L_{A10,18hr}$) for all surrounding roads and for the three Development Scenarios.

Table 10.15: Summary of Predicted Noise Level Change due to Traffic Flow Changes

Predicted Basic Noise Levels For All Road And Development Scenarios					
	2012 AADT All Veh	Future Baseline AADT All Veh	Scenario 1:	Scenario 2:	Scenario 3:
Link 1 – Calthorpe Street	64.8	64.9	65.1	65.1	64.9
Link 2 – Coley Street	55.6	55.7	55.7	55.7	55.7
Link 3 – Farringdon Road	71.3	71.4	71.5	71.5	71.4
Link 4 – Mount Pleasant	59.6	60.0	60.5	60.0	60.1
Link 5 – Phoenix Place	60.0	60.7	60.0	60.0	60.7
Link 6 – Rosebery Avenue	66.5	66.7	66.7	66.7	66.7
Link 7 – Gough Street	53.9	54.1	57.8	54.1	57.8
Differences from Future Baseline					
		Development Scenario 1:	Development Scenario 2:	Development Scenario 3:	
Link 1 – Calthorpe Street		0.1	0.1	0.0	
Link 2 – Coley Street		0.0	0.0	0.0	
Link 3 – Farringdon Road		0.1	0.1	0.0	
Link 4 – Mount Pleasant		0.5	0.0	0.1	
Link 5 – Phoenix Place		-0.7	-0.7	0.0	
Link 6 – Rosebery Avenue		0.0	0.0	0.0	
Link 7 – Gough Street		3.7	0.0	3.7	

10.162. The changes in night-time noise level can generally be expected to follow those during the daytime for the majority of surrounding roads. On Gough Street however, there would be a change in night-time traffic flow conditions as the access point to the Royal Mail staff car park would move from the south side of Phoenix Place to a new access point towards the south end of Gough Street. Traffic counts of all Royal Mail vehicle movements indicate that staff parking vehicle movements peak between 05:00 and 07:00. This effect has been specifically considered by calculating the noise level using the hourly traffic counts for vehicle access the staff car park. The method of calculation is in accordance with CRTN as per other road traffic noise calculations. It is estimated that the basic noise level in terms of hourly flow would be 62 dB L_{10} for road segments on Gough Street (again with no corrections applied for distance etc) up to the point of access to the staff car park. The equivalent continuous noise level is expected to be lower, in the order of 60 dB L_{Aeq} over these hours. This is a relatively moderate level of noise for the area, being similar to noise levels currently experienced on Phoenix Place and Mount Pleasant and less than the levels of noise along Calthorpe Street. Existing properties along the southern extent Gough Street are commercial in use with sealed facades. Such a facade could readily be expected to reduce noise levels from outside to inside by at least 30 dB or more such that the level of road traffic noise level inside would be reduced to less than 35 dB(A). Ideally an office should have noise intrusion levels of less than 40 dB(A). Additionally, and arguably more relevant is that the commercial buildings are unlikely to be in use at these times. On this basis the potential effect of the increased level of noise due to traffic accessing the car park on Gough Street is assessed as being **negligible**.

Development Scenario 1

10.163. Table 10.15 indicates that the change in noise level due to traffic flow variations resulting from Development Scenario 1 (the Entire Development) would have a **negligible effect** for receptors on the majority of surrounding roads. Phoenix Place road is predicted to have a **beneficial effect** of **minor significance** due to a slight reduction in traffic noise.

10.164. Gough Street would see an increase of just over 3dB for the daytime period which is deemed to be an adverse effect. As discussed above, noise level during the shoulder periods between night-time and daytime may see the greatest level of noise change**.** However, properties local to the area which would be subject to increased noise levels are commercial in use with sealed facades, such that the effect in practice is likely to be **negligible**.

Development Scenario 2

10.165. The change in noise level due to traffic flow variations resulting from Development Scenario 2 (the Calthorpe Street Development) would have a **negligible effect** for receptors on all surrounding roads. Phoenix Place road is predicted to have a **beneficial effect** of **minor significance** due to a slight reduction in traffic noise. Gough Street would not see the 3dB increase as with Development Scenario 1 as Phoenix Place would not be developed in this Development Scenario.

Development Scenario 3

10.166. Table 10.15 indicates that the change in noise level due to traffic flow variations resulting from Development Scenario 3 (the Phoenix Place Development) would have a **negligible effect** for receptors on the majority of surrounding roads. Phoenix Place road is predicted to have a **beneficial effect** of **minor significance** due to a slight reduction in traffic noise.

10.167. Gough Street would see an increase of just over 3dB for the daytime period which is deemed to be an adverse effect. As discussed above, noise level during the shoulder periods between night-time and daytime may see the greatest level of noise change**.** However, properties local to the area which would be subject to increased noise levels are commercial in use with sealed facades, such that the effect in practice is likely to be **negligible**.

Ambient Noise Effects within All Development Scenarios

10.168. The NPPF states that planning policies and decisions should aim to avoid noise from giving rise to significant adverse effects on health and quality of life as a result of new development. Both LBI and LBC require that environmental noise must be reduced to suitable internal noise standards for new residential developments, less than 35dB L_{Aeq} inside living rooms and 30dB L_{Aeq} in bedrooms throughout the night time.

10.169. Farringdon Road is subject to relatively high levels of noise due to road traffic which includes movements of Royal Mail vehicles accessing and departing the Mount Pleasant Sorting Office. Under Policy DM 15 of the LBI's Development Management Policies Submission, 2012, the Farringdon Road boundary would be classified as NEC C, where it states that planning permission should not normally be granted but that where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise. The other surrounding roads are subject to relatively moderate levels of noise, generally in NEC B or A.

10.170. To gain a comprehensive understanding of the variability of noise through the Site in future when the buildings are complete and specifically to quantify expected levels of noise exposure to all the various facades so as to enable early assessment of façade design requirements, a three dimensional computer noise model was constructed. Figures 10.13 to 10.16 present output from the modelling as 3D noise maps. Figures 10.17 then simplifies the results with a mark-up of the plans for all the Development Scenarios indicating bands of noise from 45-50 dB L_{Aeq} to areas with noise levels of greater than 70 dB L_{Aeq}. This information then informs, with calculations undertaken in accordance with BS 8233, the necessary level of sound reduction required by the various facades to limit noise to the ideal internal standards as required by LBI and LBC.

10.171. BS8233 comments that the sound reduction of a facade will generally be controlled by the weakest part of the façade and this will generally be the window or, where natural ventilation is adopted, the passive background ventilator (the ventilation strategy is for mechanical ventilation with heat recovery such that through window/wall trickle vents are not required). The standard advises that a conventional façade comprising thermal grade double glazing typically offers a sound reduction of 33 to 35 dB. This is also supported by guidance in PPG24 (which has now been replaced by the NPPF).

10.172. BS 8233 also provides a method for calculating the level of noise intrusion. A simplified assessment is to subtract the internal noise standard from the external noise level at the façade and apply a correction of 5 dB to account for the effect of amplification of noise entering the room.

10.173. So, at 65 dB L_{Aeq} outside during the daytime and the need to achieve 35 dB inside living areas, there would be a need for a façade reduction of 35 dB. This is achievable with a conventional system comprising thermal grade double glazing units. Reference to Figure 10.17 indicates that this would mean that, for many of the facades of all Development Scenarios, a relatively conventional façade solution would be sufficient to reduce external noise levels to the standards required by LBI and LBC. This includes façades overlooking the eastern part of Calthorpe Street, Phoenix Place, Mount Pleasant and all facades looking into courtyards. The effect of noise on

residents in these areas would therefore be **negligible** where the basic design and specification of the buildings would comprise double glazing and mechanical ventilation with heat recovery.

10.174. The foregoing assessment is based on daytime noise levels, but the principle remains the same for night where the internal noise standards reduce by 5 dB and the external noise level also typically decrease by an order of 5 dB due mainly to reduced traffic flows.

10.175. At the detailed design stage, detailed consideration will be given to the precise acoustic specification of all facades with calculations for all living rooms and bedrooms.

10.176. In areas where the noise level exceeds 65 dB L_{Aeq} at facades which includes part of Calthorpe Street and all of Farringdon Road, the level of noise intrusion would be excessive if a conventional façade specification was provided. In these cases, environmental noise levels for residents could potentially have an **adverse effect** of **substantial significance.** It can be expected therefore that high performance facades will be required in these areas to control external noise to the required internal standards.

Direct Noise and Vibration Transfer to Residential Units above the Basement of the Sorting Office

10.177. The Enabling Works, which would be undertaken as the first phase of the Calthorpe Street Development, would involve the construction of a lightweight roof canopy over the external service depot, where there would be an access tunnel formed from Farringdon Road to the basement service area. This would be undertaken as the first phase of works of the Calthorpe Street Development and thus completed prior to the redevelopment of the remainder of the Calthorpe Street Development. The proposed Calthorpe Street Development (Scenarios 1 and 2) design would involve building residential units (Calthorpe Street Block F) over the tunnel to the basement. There would be very high levels of noise, particularly low frequency rumble from the engines of HGV's which would access and exit the Sorting Office basement directly beneath the habitable rooms at all times of day and night time.

10.178. There would be a substantial separating concrete structure between the basement tunnel and the residential units above. However, with no specific mitigation, the noise from vehicles would be expected to be discernible above the lowest ambient noise levels in apartments. This effect could give rise to disturbance and could lead to nuisance. As such, without noise and vibration control measures, there is potential for an **adverse effect** of **substantial significance**.

Royal Mail Vehicle Noise Emissions to Surrounding Receptors

10.179. Whilst the main vehicle access and exit point for the Mount Pleasant Sorting Office is currently via Farringdon Road, it is open to the atmosphere, which would change as part of the Calthorpe Street Development. Consideration was given to the potential effect of noise projecting from the access point to surround sensitive areas, both the Farringdon Road façade of the Calthorpe Street Development and existing premises on the opposite side of Farringdon Road.

10.180. A 3-dimensional computer model was developed to better understand how noise generated by HGVs and other vehicles in the tunnel and at the entry / exit point projected out to premises on the opposite side of Farringdon Road and also how it spreads across the façade of the Calthorpe Street Site. It also enabled analysis of the potential effect of introducing acoustic absorption treatment to control noise build up in the tunnel. Figure 10.18 summarises the results in a graphical form.

10.181. The modelling determined the following key points:

- With no treatment to the tunnel ramp access to the basement, it requires in the order of 15m for noise from tunnel opening (centre point) to reduce to a level equal to the existing normal ambient noise level on Farringdon Road; and
- With acoustic absorption introduced to the tunnel the level of noise projected is reduced by 7dB and the distance at which the new tunnel generated noise equals the existing ambient noise reduces to less than 8m.

10.182. There are no residential façades overlooking or within 15m of the tunnel entrance/exit.

10.183. The effect of noise breakout from the tunnel ramp which provides access to the basement from Farringdon Road on surrounding receptors would be **negligible**.

Vibration and Re-radiated Noise within Development Scenarios

10.184. Ground borne vibration levels were measured at the boundary of Farringdon Road cognisant of the proximity of the Metropolitan Line and that Farringdon Road is subject to relatively high volumes of HGV movements. The results as summarised in Table 10.11 show that VDV values calculated from the highest measured short term sample results show a less than low probability of adverse comment, for daytime and night time occupancy according to BS 6472 and no account has been given for attenuation through the structure. The potential vibration effect is therefore deemed to be **negligible**. This relates to Development Scenarios 1 and 2. There are no notable ground borne sources of vibration affecting Development Scenario 3 which can therefore assessing as being a negligible effect.

10.185. Recognising the potential for vibration to manifest as noise due to re-radiation off building structures, consideration has been given the potential level of structure borne noise effecting the new buildings within the Calthorpe Street Development, Scenarios 1 and 2. Predictions of structureborne re-radiated noise levels as summarised in Table 10.12 indicated levels of between 30 and 39 dB(A) depending upon the amplification factor applied with relates to the final form of the building structure. These levels when assessed against guide criteria as set out earlier in this Chapter are low, the effect being **minor adverse** with **negligible significance**.

Building Services Noise

10.186. Noise produced by new building environmental engineering services plant must be controlled to achieve acceptable levels of environmental noise, both within the development itself and in the surrounding areas.

10.187. Noise from any externally mounted plant, including any grilles and louvres, would be designed to meet the requirements of LBI and LBC. It is considered that effects could be suitably controlled through appropriate planning conditions attached to any planning permission for development on the Site. Noise limits relative to background noise should be derived for specific locations around the Site in agreement with both local environmental health departments.

10.188. At this stage, whilst the type of equipment and general location of external plant have been identified, precise items of plant were not selected. As a consequence, a detailed assessment of effect cannot be provided. Without noise mitigation to noise generating plant it is, however, considered likely that there would be a potential risk for **adverse effect** of **substantial significance** on noise sensitive areas.

Noise in Courtyards

10.189. In addition to the indoor acoustic conditions, consideration has also been given to noise in the proposed courtyards which offer space for external amenity. The maps in Figures 10.15 indicate that noise from surrounding road traffic, which is the dominant source of noise impacting upon the Site, is generally below 50 dB L_{Aeq} during the daytime within shielded courtyard areas just off the worst case Farringdon Road. This is lower than the WHO guideline level of noise for outdoor spaces and such the effect of noise on residents wishing to use the courtyard areas within both the Calthorpe Street Development and Phoenix Place Development would be of **negligible significance**, for each Development Scenario.

10.190. In the landscaped podium area between Blocks F and H / G, there would be some areas which are relatively open to Farringdon Road, the result of which would be noise levels exceeding the WHO guidelines for noise in outdoors spaces. Whilst this might be deemed an adverse effect, and of substantial significance, if simply assessed against the guide level to be excessive, , it is considered that the space exposed to the elevated levels of traffic noise is more a transient space leading in and out of the Calthorpe Street site, rather than one which is purposely for rest and relaxation as might be the case for the courtyard areas. On this basis the potential effect is considered to be **adverse** and of **moderate significance**.

10.191. Within the courtyards there is also the potential for noise to be generated by user speech and activities. In particular, during the pre-application discussions LBI raised question about the effect of user noise generated in the courtyard of Block J of the Calthorpe Street Development on the residents of surround dwellings. No objective assessment has been provided, but the risk of excessive noise build up has been considered in developing the design. The following section discusses the provisions made to provide practical control of reverberant noise build up in the space.

Mitigation Measures

Demolition and Construction

Noise and Vibration - Development Scenarios 1, 2 and 3

10.192. The construction noise and vibration mitigation measures indicated in BS 5228 would be implemented across all Development Scenarios as necessary. These are discussed below.

10.193. The hours of working would be planned, taking into consideration the effects of noise and vibration upon persons in areas surrounding Site operations and upon persons working on the Site; the nature of land use in the areas concerned; the duration of work and the likely consequence of any lengthening of work periods.

10.194. Those activities that may give rise to the highest noise at the surrounding properties and HGV's deliveries to the Site would be limited to the hours 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. Night time working would be restricted to exceptional circumstances. If required, out-of-hours works would be subject to prior agreement and reasonable notice with the authorities, who may impose certain restrictions. All vehicles accessing the Site would need to follow the route and procedures described in a Construction Traffic Management Plan for each site, based on an assessment by the Principal Contractor in consultation with both LBI and LBC.

10.195. Controlling noise and vibration at source and limiting the spread of noise by methods such as:

- Substitution of noisy plant with quieter alternatives;
- Provide enclosures and barriers around noisy plant;
- Breaking out of concrete structures undertaken, where possible, using low noise effect methods including bursting and splitting rather than percussive breaking;
- Use of appropriate piling techniques and consultation with local residents as required. Operational mitigation, including reduced auger excitation from the maximum assumed 10.7kJ would be need to be implemented to limit the effect of piling vibration upon the nearest properties the Site.
- Careful use and siting of noisy plant; and
- Maintenance of plant to minimise increase in noise with age and use.

10.196. On Site noise and vibration levels would be monitored regularly, particularly if changes in machinery or project designs are introduced, by a suitably qualified person appointed specifically for the purpose.

10.197. It may be a requirement of the LBI and LBC that a Section 61 Agreement, Control of Pollution Act 1974, is entered into in order to further define limits and control methods for noise and vibration. This would be implemented by the Principal Contractor, and so would be discussed at Tender stage if necessary.

10.198. The above measures would be incorporated into two site-specific Construction Environmental Management Plans (CEMP), which would be prepared for the Calthorpe Street site and the Phoenix Place site, as detailed within Chapter 6: *Development Programme*, *Demolition and Construction*, which would likely be secured through a condition on any planning permission for development on the Site.

10.199. Where reasonably practicable, ensuring the use of quiet working methods, the use of the most suitable plant, reasonable hours of working for noisy operations, and economy and speed of operations.

Completed Development

Operational Road Traffic Noise - Development Scenarios 1, 2 and 3

10.200. The change in noise level due to traffic flow variations resulting from all Development Scenarios would have a negligible effect for receptors on the majority of surrounding roads. Phoenix Place road is predicted to have a beneficial effect of minor significance due to a slight reduction in traffic noise. Gough Street would see an increase of just over 3dB for the daytime period which is deemed to be an adverse effect of minor significance. No specific mitigation measures are proposed.

Ambient Noise Intrusion - Development Scenarios 1, 2 and 3

10.201. The assessment showed that parts of the Site, relevant to Development Scenario 1 and 2 are exposed to relatively high levels of environmental noise, particularly dwellings fronting onto parts of Calthorpe Street and Farringdon Road. Without mitigation to overcome these high levels of noise, acoustic conditions within the residential units would not allow occupants to rest and sleep.

10.202. Noise intrusion to the Development Scenarios from a variety of sources, as described above, would be controlled through the design of the façades of each building such that they provide sufficient sound attenuation, in order to achieve the levels of noise intrusion of Table 10.4. This would involve all areas of the façades including solid areas, glazing, vents and roofs.

10.203. The sound reduction performance of each building façade would need to be specified based on the specific design of that façade, i.e. depending on location, orientation, glazed area percentage, level of noise exposure etc. This would be undertaken as part of the detailed specification of each building in consultation with the LBI and LBC environmental health departments, and is likely to be secured by a condition on any planning permission for development on the Site.

10.204. Table 10.16 provides an outline summary of the type of construction and therefore mitigation that would likely be required on the noisiest areas of the Site. It also includes for completeness an outline of the measures for quieter areas.

Table 10.16: Typical Façade Constructions to Mitigate Noise Intrusion

Area	Typical Façade Construction
Residential Façades Overlooking Farringdon Road	• Solid areas – high-performance built-up cladding system (likely to be require >50dB Rw); • High-performance acoustically rated double or triple glazing (in the order of 45dB Rw, to be confirmed by precise calculation during detailed design development); • A Whole House Vent system with heat recovery is proposed throughout with optional boost function for increased air change rates to control overheating where necessary. The system would be provided with acoustic attention to the fans to limit self-noise nuisance to occupants. • Solar shading / glazing with solar gain control.
Residential Façades Overlooking Calthorpe Street	• As above but with lower grade glazing systems due to reduced external façade noise levels.
Commercial Areas	• Solid areas – cladding system; • Acoustically rated double glazing; and • Acoustically rated trickle vents or sealed units with air conditioning.
Other Residential Elevations on quieter roads or looking into courtyards	• Solid areas – built-up cladding system; • Relatively conventional double glazed units; and • As a minimum, high performance acoustically rated through-wall vents or trickle vents, with mechanically assisted ventilation. However, the ventilation strategy throughout is proposed to be whole house vent.

Vibration

10.205. The effects of existing ground borne vibration levels have been assessed using Site measurement data which found the effect to be of negligible significance. No provision has been made for vibration isolation measures to buildings. Risk of vibration from vehicle movements with in the Royal Mail basement have been considered and discussed in the following section. Building environmental engineering services would be provided with appropriate isolation measures, addressed later in this Chapter.

Direct Noise Transfer to Residential Units Above the Basement of the Sorting Office

10.206. This element relates only to the Calthorpre Street Development, Scenarios 1 and 2. Fundamentally to reduce the very high levels of noise predicted to arise from vehicle movements in the basement from entering the accommodation above, the Royal Mail basement (part of the future baseline) and the later phased development on the Calthorpe Street site structure would need to be isolated from each other. Common structure from one to the other would limit the noise attenuation and there would be a risk of discernible noise intrusion to habitable rooms due to vehicle movements in the basement and the access tunnel to and from the basement. Complete physical separation would not be practical; isolation would be achieved mechanically with spring / resilience-based systems.

10.207. The preferred option is to make allowance to form a box in a box construction within the tunnel directly beneath accommodation and provision has been made in the concept design. This would involve the ramp floor, walls and columns, and ceiling structure being isolated from the primary supporting structure and such provision has been made in the early stage design.

10.208. The ramp surface would be formed as a floating floor system, where a structural concrete slab would set upon vibration isolation material, most likely an elastomeric mount or rubber type product, which would be suitable to take both the dead and live load and retain sufficient dynamic stiffness to dampen and control vibration and noise transfer into the main supporting base structure. Additionally, there would be no speed-control humps in the basement access road and the surface would be selected to avoid tyre squeal.

10.209. Provision has been made in the design for the separating wall between the basement and retail units at this stage to be at least 500mm thick. In some areas there would be an increased buffer zone due to riser formations. It is proposed that the wall be constructed with a significant mass element; the current provision is for a 300mm concrete wall. The inner lining of the wall to the basement side would need to be constructed either physically independent from the concrete wall or resiliently fixed off the wall. The lining, if independent, could be block-work or, if supported off the concrete wall, could be formed of multiple dense gypsum board, cement particle board, or concrete panels.

10.210. Columns would also need to be isolated in the same way.

10.211. There would need to be an isolated mass barrier ceiling, which would be formed of multiple layers of dense gypsum board or cement particle board suspended under the main structure on a resilient (spring based) support system. At present the design indicates a double slab arrangement in some parts, which essentially forms a horizontal services route. Acoustically it may be possible to replace the services containment with the resilient ceiling. However, in reducing the mass it may be necessary to provide a floating floor within the first level of residential accommodation. This would require a zone of 70 to 100mm. The underside of the ceiling system should also be treated with an acoustically absorptive finish in order to control the reverberant build up on noise within the tunnel.

10.212. The extent of treatment would need to be accurately defined but would largely be limited to areas used by the larger HGVs. In the lighter vehicles part of the basement it can be expected that the box in box type solution could be avoided.

10.213. Alternative options were also considered for subsequent detailed design phases.

10.214. The first would be to isolate the residential building structure from the basement box using elastomeric bearings and isolated linings. This would allow the basement box to be constructed in a relatively conventional way. The Calthorpe Street Development would then be isolated from the basement. Structural columns would be constructed off isolation bearings provided to the surface of the basement structure. It is understood that the structural design would need to address lateral stability in a different way, potentially tying back to lift core structure (structural engineer to advise implications). Should this option be desirable, it is recommended that a dynamic analysis should be carried out, potentially employing finite element modelling.

10.215. The second approach could be to locally isolate within individual accommodation units. This would allow the basement box to be constructed in a relatively conventional way. However the option would potentially require significant additional space within the apartments. Floating floors and specialist walls with isolated wall linings would likely be required and there would be uncertainty on the number of floor levels where the treatment would be needed. This option is considered unlikely to be feasible because it would consume too much space. It is more likely to be feasible for the retail units.

10.216. It is noted for completeness here that where the roof over the external service area has roof lights or other penetrations for ventilation, the design has made provision for these to be acoustically rated such to maintain the sound reduction integrity of the enclosure structure.

Royal Mail Vehicle Noise Emissions to Neighbours

10.217. This element relates only to Development Scenarios 1 and 2. To control noise breakout from the tunnel opening to the neighbouring properties on the opposite side of Farringdon Road, it is recommended that the level of noise build up within the tunnel where vehicle will access and exit the RMG basement, be controlled by the application of an acoustic absorption treatment. This could be a robust acoustic panel system such as Quietstone™ or perforated metal sandwich panels, or direct spray application such as Sonaspray™ to ceiling surface.

Building Services Noise

10.218. In order to achieve environmental noise limits set relative to the lowest measured background noise levels, noise mitigation measures would likely be needed. The final selection of equipment would be subject to detailed specification but for indicative purposes the following control measures would need to be observed.

10.219. At this stage it is recommended that dry air cooler plant serving residential units and located at roof level shall incorporate a noise reduction package such that the output is in the order of 70 to 73dB Lw. Perimeter screening to the plant should also be provided. Heat rejection and air handling plant for the commercial offices would need to be selected with consideration to noise output and provisions should be made for atmospheric side attenuators to air moving equipment. Provisions should also be made for attenuation of any emergency generator equipment.

10.220. Any building services plant associated with office and retail fit-out would be controlled by the inclusion of acoustic criteria in the agreement to lease documentation.

Noise in Courtyards

10.221. During the pre-application discussions LBI raised question about the impact of user noise generated in the courtyard of Block J of the Calthorpe Street Proposed Development on the residents of surround dwellings. The design includes an open top which is essentially 100% acoustically absorptive. Provision has also been made for robust acoustically absorptive materials to building surfaces, particularly to the underside of walkways and locally to balcony areas, which is intended to the provide practical means of limiting spread of occupant noise to other parts of the courtyard.

Likely Residual Effects

Demolition and Construction

10.222. It remains inevitable that noise and vibration from construction activities would temporarily affect the existing noise-sensitive residential receptors in the area surrounding the Site. However, following mitigation (and in particular implementation of the EMPs), the resulting likely residual effect of construction works would on noise and vibration conditions in the area around the Site would be **short term**, **negligible** to **minor adverse significance**. There would be no difference between the three Development Scenarios.

Completed Development

Operational Road Traffic Noise - Development Scenarios 1, 2 and 3

10.223. Projections of future traffic flows indicate a reduction in vehicles, including HGVs. Changes in traffic flow following the completion and occupation of the Development Scenarios are predicted to have a likely residual effect of **negligible significance** for the majority of roads. However, Gough Street would be subject to an increase of just over 3dB, which is assessed as being a likely residual **adverse effect** of Development Scenarios 1 and 3 of **minor significance.**

Ambient Noise Effects within All Development Scenarios

10.224. The likely residual effect of the surrounding ambient noise due mainly to road traffic on the internal environment within the Development Scenarios is predicted to be **negligible**, based on the implementation of the suitable façade design mitigation measures to achieve acceptable noise intrusion levels.

10.225. The sound reduction performance of each building façade would need to be specified based on the design of that façade, i.e. depending on noise exposure level, location, orientation, glazed area percentage, ventilation type, etc. This would be undertaken as part of the detailed specification of each building in consultation with LBI and LBC, and would likely be secured by a condition requiring approval of the design details on the planning permission for development on the relevant part of the Site.

Royal Mail Activity Noise Effects on Future Residents

10.226. The likely residual effect of noise from the RMG vehicles on the internal environment within the Development Scenarios is predicted to be **negligible**, based on the implementation of the suitable design mitigation measures, involving the acoustic separation between demises, to achieve acceptable noise intrusion levels.

RMG Activity Noise Effects on Existing Residents

10.227. The likely residual effect of noise from the RMG vehicles on noise sensitive receptors is predicted to be **negligible**, based on the implementation of the suitable design mitigation measures, including the provision of acoustic treatment the tunnel ramp where vehicle access and exit the basement at Farringdon Road.

Vibration and Re-radiated Noise within Development Scenarios

10.228. The potential effect of existing sources of vibration was deemed negligible. The likely residual effect of vibration within each of the three Development Scenarios would remain **negligible**.

Building Services Noise

10.229. Following the implementation of the specified mitigation measures, the likely residual effect of noise from building services plant operation within the Development Scenarios is assessed as being **negligible**.

Conclusion

10.230. Table 10.17 presents a summary of the potential effects, mitigation measures and likely residual effects of noise and vibration associated with the Development Scenarios identified in the assessment. .

Table 10.17: Summary of Likely Potential Effects, Mitigation Measures and Residual Impacts

Issue	Potential Effect	Mitigation Measures	Residual Effects
Demolition and Construction			
Development Scenario 1, 2, 3			
Noise and Vibration - Development Scenarios 1, 2 and 3	Minor to **moderate adverse**, **temporary** and of a **local significance**, prior to mitigation, depending on the different construction activities and their distance to the sensitive receptors and hours of operation. This is applicable to each Development Scenario.	Mitigation measures and restriction in working hours as indicated in BS 5288 and included within the CMP.	Short term, **negligible** to **minor adverse**
Piling Vibration	**Major adverse**, **temporary** and of a **local significance**, prior to mitigation, depending on the piling type and their distance to the sensitive receptors and hours of operation	Mitigation measures and restriction in working hours as indicated in BS 5288 and included within the CMP.	Short term, **negligible** to **minor adverse**
Completed Development			
Development Scenario 1			
Operational Road Traffic Noise	**Negligible effect** for receptors on majority of surrounding roads. Phoenix Place road is predicted to have a **beneficial effect** of **minor significance** due to a slight reduction in traffic noise. Gough Street would see an increase in noise which is deemed to be an **adverse effect** of **minor significance**.	No specific mitigation measures are proposed.	Negligible **significance** for the majority of roads **Adverse effect** of Development Scenarios 1 and 3 of **minor significance**
Ambient Noise Effects on Proposed Development	**Negligible effect** for receptors overlooking the eastern part of Calthorpe Street, Phoenix Place, Mount Pleasant and all facades looking into	Provision of measures to mitigate against existing noise levels in consultation with LBI and LBC, including:	**Negligible**, based on the implementation of the suitable façade design

Issue	Potential Effect	Mitigation Measures	Residual Effects
	courtyards. **Adverse effect** of **substantial significance** for receptors overlooking the western extent of Calthorpe Street and on Farringdon Road without mitigation.	• Façade design; • Glazing measures; • Mechanical Ventilation; and • Control of thermal overheating where necessary	mitigation measures to achieve acceptable noise intrusion levels.
Royal Mail Vehicle Noise Emissions to Surrounding ReceptorsEffect of noise breakout from the tunnel ramp which provides access to the basement from Farringdon Road on surrounding receptors would be **negligible**. Provision has been made in the concept design for acoustic absorption treatment to the tunnel accessing the basement from Farringdon Road to control noise build up from vehicles. **Negligible**, based on the implementation of the suitable design mitigation measures, including the provision of acoustic treatment the tunnel ramp Direct Noise and Vibration Transfer to Residential Units above the Basement of the Sorting Office	Potential for **adverse effect** of **substantial significance** without mitigation	Provision has been made in the concept design to form a box in a box construction within the tunnel accessing the basement from Farringdon Road directly beneath accommodation.	**Negligible**, based on the implementation of the suitable design mitigation measures, involving the acoustic separation between demises, to achieve acceptable noise intrusion levels.
Vibration	Potential effect of existing sources of vibration was deemed **negligible**.	None	The likely residual effect of plant operational vibration within the Development would remain **negligible**.
Building Services Noise	Without noise mitigation to noise generating plant, it is however considered likely that there would be a potential risk for adverse effect of substantial significance on noise sensitive	Acoustic attenuation scheme will include measures to mitigate against plant noise as required by LBI and LBC, including: • Selection of quiet plant;	Following the implementation of the specified mitigation measures, **negligible**

Issue	Potential Effect	Mitigation Measures	Residual Effects
	areas.	• Screening of plant; • Use of attenuators; and • Use of enclosures.	effect
Noise in Courtyards	Effect of noise on residents wishing to use the courtyard areas within both the Calthorpe Street and Phoenix Place Proposed Developments would be **negligible**.	The design includes an open, 100% acoustically absorptive, top. Provision has been made for robust acoustically absorptive materials to building surfaces, to limit spread of occupant noise to other parts of the courtyard.	Effect of ambient noise impacting upon the courtyards is predicted to **negligible.** Following the implementation of the specified mitigation measures, risk of noise generated by occupants using the courtyards is assessed as being **negligible**.
Development Scenario 2			
Operational Road Traffic Noise	**Negligible effect** for all receptors on majority of surrounding roads.	No specific mitigation measures are proposed	**Negligible significance**
Ambient Noise Effects on Proposed Development	**Negligible effect** for receptors overlooking the eastern part of Calthorpe Street, Phoenix Place, and all facades looking into courtyards. **Adverse effect** of **substantial significance** for receptors overlooking the western extent of Calthorpe Street and on Farringdon Road without mitigation.	As per Development Scenario 1.	As per Development Scenario 1.
Direct Noise and Vibration Transfer to Residential Units above the Basement	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.

Issue	Potential Effect	Mitigation Measures	Residual Effects
of the Sorting Office			
Royal Mail Vehicle Noise Emissions to Surrounding Receptors	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.
Vibration	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.
Building Services Noise	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.
Noise in Courtyards	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.
Development Scenario 3			
Operational Road Traffic Noise	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.
Ambient Noise Effects on Proposed Development	**Negligible effect** for receptors overlooking the eastern part of Phoenix Place, Mount Pleasant and all facades looking into courtyards.	As per Development Scenario 1.	As per Development Scenario 1.
Vibration	**None**	None	None
Building Services Noise	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.
Noise in Courtyards	As per Development Scenario 1.	As per Development Scenario 1.	As per Development Scenario 1.

References

1 The Environmental Protection Act 1990 (EPA)

2 Control of Pollution Act 1974 (CoPA) (1974); HMSO, London.

3 National Planning Policy Framework

4 DEFRA, Noise Policy Statement for England' (NPSfE) 2010,

5 Greater London Authority (GLA), The London Plan: Spatial Development Strategy for Greater London, 2011

6 London Ambient Noise Strategy, 2004

7 Greater London Authority, The London Plan: Spatial Development Strategy for Greater London, Revised Early Minor Alterations, 2012.

8 London Borough of Islington's Development Management Policies Submission, 2012

9 London Borough of Islington (2012) Site Allocations Submission June 2012

10 London Borough of Islington (2012) Finsbury Local Plan Submission 2012

11 London Borough of Islington's Core Strategy, 2011

12 London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

13 London Borough of Camden's Site Allocations Proposed Submission Document, 2012

14 London Borough of Camden's Core Strategy, 2010-2025, 2010

15 London Borough of Camden's Development Policies 2010-2025, 2010

16 Mount Pleasant Supplementary Planning Document, 2012

17 London Borough of Islington Environmental Design Planning Document, 2012

18 London Borough of Islington Streetbook Supplementary Planning Document, 2012

19 London Borough of Islington Urban Design Guide Supplementary Planning Document,

20 Sustainable Design and Construction Supplementary Planning Guidance, 2006

21 British Standards Institute (BSi) (1999): BS 8233 *'Sound Insulation and Noise Reduction for Buildings - Code of Practice'*.

22 Building Regulations 2000, Approved Document E, Resistance to the passage of sound.

23 Standards Institute (BSi), (2009): 'BS5228 - Noise and Vibration Control on Construction and Open Sites', BSi, London.

24 World Health Organisation (WHO), (2000); 'Guidelines for Community Noise', WHO, Geneva.

25 British Standards Institute (BSi), (1997): 'BS4142 - Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas', BSi, London.

26 Department of Transport / Welsh Office Memorandum, Calculation of Road Traffic Noise (1998)

27 Institute of Acoustics (IOA) and the Institute of Environmental Management and Assessment (IEMA). Draft Guidelines for Noise Effect Assessment, March 2002

28 BS 6472-1 'Guide to Evaluation of Human Exposure to Vibration in Buildings, Part 1: Vibration Sources Other Than Blasting'

29 ANC (The Association of Noise Consultants) Measurement and Assessment of Groundborne Noise and Vibration

30 Bies & Hansen Engineering Noise Control (Second Edition) Transportation

31 Proceedings of Inter Noise 1993 (R J Greer) AEL Methodology for the prediction of re radiated noise in residential buildings from trains travelling in underground tunnels.

32 Noise Reference Book, Paul Nelson (editor), 1978, Butterworths

11. Air Quality

Introduction

11.1. This Chapter assesses the potential effect of each Development Scenario on local air quality. In particular, consideration is given to the likely effects of potential emissions from demolition and construction activities, as well as emissions from operational road traffic and heating plant associated with each of the Development Scenarios on existing sensitive receptors surrounding the Site, and at receptors within the Entire Development itself.

11.2. This Chapter describes the methods used to assess the baseline conditions currently existing at the Site and surrounding areas, the likely significant direct and indirect effects of each Development Scenario during demolition and construction works and once complete and operational, the mitigation measures required to prevent, reduce or offset the effects and the subsequent nature and likely significance of the residual effects.

11.3. The Chapter has been written by Waterman Energy, Environment & Design Ltd and is supported by Appendix 11.1: Air Quality Monitoring Study and Appendix 11.2: Air Quality Modelling Study.

Legislation, Planning Policy and Guidance

Legislation

European Legislation

11.4. Air pollutants at high concentrations can give rise to adverse effects on the health of humans and ecosystems. European Union (EU) legislation on air quality forms the basis for national UK legislation and policy on air quality.

11.5. The European Union Framework Directive 2008/50/EC[1] on ambient air quality assessment and management came into force in May 2008 and was implemented by Member States, including the UK, by June 2010. The Directive aims to protect human health and the environment by avoiding, reducing or preventing harmful concentrations of air pollutants.

National Legislation

Air Quality Standards Regulations

11.6. The Air Quality Standards Regulations 2010[2] implement limit values prescribed by the Directive 2008/50/EC. The limit values are legally binding and the Secretary of State, on behalf of the UK Government, is responsible for their implementation.

The UK Air Quality Strategy

11.7. In a parallel process, the Environment Act 1995[3] required the preparation of a national air quality strategy setting health-based air quality objectives for specified pollutants and outlining measures to be taken by Local Planning Authorities (LPA) in relation to meeting these (the Local Air Quality Management (LAQM) system).

11.8. The UK Air Quality Strategy[4] (AQS) adopted in 1997, was subsequently reviewed and revised in 2000 as the Air Quality Strategy for England, Scotland, Wales and Northern Ireland[5], and an amendment to this Strategy was published in 2003[6]. The current UK AQS was published in July 2007[7] and updates the original strategy to set out new objectives for LPAs in undertaking their local air quality management duties. The 2007 UK AQS introduced a national level policy framework for exposure reduction for fine particulates. Objectives in the current UK AQS are in some cases more onerous than the limit values set out within the relevant EU Directives and the Air Quality Standards Regulations 2010. In addition, objectives were established for a wider range of pollutants. The limit values and objectives of air pollutants relevant to this assessment are summarised in Table 11.1.

Table 11.1: Summary of Relevant Air Quality Limit Values and UK AQS Objectives

Pollutant	Objective / Limit Value		Date by which Objective to be Met
	Concentration	Measured as °	
Nitrogen dioxide (NO_2)	200µg/m^3	1 hour mean not to be exceeded more than 18 times per year	31/12/2005
	40µg/m^3	Annual mean	31/12/2005
Particulate Matter (PM_{10})	50µg/m^3	24–hour mean not to be exceeded more than 35 times per year	31/12/2004
	40µg/m^3	Annual mean	31/12/2004
Particulate Matter ($PM_{2.5}$)	Target of 15% reduction in concentrations at urban background locations	Annual mean	Between 2010 and 2020
	Variable target of up to 20% reduction in concentrations at urban background locations*	Annual mean	Between 2010 and 2020
	25µg/m^3	Annual mean	01/01/2020

Note: * Aim to not exceed 18µg/m^3 by 2020

11.9. There are currently no statutory UK standards in relation to deposited dust and its propensity to cause nuisance, although an annual deposition rate of 200mg/m^2/day is sometimes used as a threshold value for potentially significant nuisance effects[8].

Local Authority Responsibility

11.10. Part IV of the Environment Act 1995 provides a system of LAQM, under which LPAs are required to review and assess the future quality of the air in their area by way of a staged process. Should this process suggest that any of the AQS objectives will not be met by the target dates, the LPA must consider the declaration of an Air Quality Management Area (AQMA) and the subsequent preparation of an Air Quality Action Plan (AQAP) to improve the air quality in that area in pursuit of the objectives.

11.11. The London Borough of Islington (LBI) has designated the entire Borough an AQMA for both NO_2 and daily mean PM_{10}. The London Borough of Camden (LBC) has also designated the entire Borough an AQMA for annual mean NO_2 and annual and daily mean PM_{10}. Therefore the Site is located in an AQMA. A summary of LBI and LBC's review and assessment of air quality is provided in the 'Baseline Conditions' section below. As a result of the declaration of an AQMA LBI and LBC prepared AQAPs, a summary of the AQAPs is provided in the 'Guidance' section below.

National Planning Policy

National Planning Policy Framework, 2012

11.12. Published in March 2012 the National Planning Policy Framework (NPPF)[9] replaced with immediate effect the majority of existing national planning policy guidance, including Planning Policy Guidance and Planning Policy Statements.

11.13. The NPPF identifies that the planning system should aim to conserve and enhance the natural and local environment by:

…"preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of land, air, water or noise pollution or land instability."

11.14. Furthermore, it states:

"Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan".

Environmental Protection UK: Planning for Air Quality, 2010

11.15. The Environmental Protection UK's (EPUK) Development Control: Planning for Air Quality (Update 2010) document[10] advises:

"in arriving at a decision about a specific proposed development the [LPA] is required to achieve a balance between economic, social and environmental considerations."

Regional Planning Policy

The London Plan, Spatial Development Strategy for Greater London, 2011

11.16. Policy 7.14 'Improving air quality' of the adopted London Plan[11] states that development proposals should:

"A. minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within Air Quality Management Areas (AQMAs) and where development is likely to be used by large numbers of those particularly vulnerable to poor air quality, such as children or older people) such as by design solutions, buffer zones or steps to promote greater use of sustainable transport modes through travel plans (see Policy 6.3);

B. promote sustainable design and construction to reduce emissions from the demolition and construction of buildings following the best practice guidance in the GLA and London Councils' 'The control of dust and emissions from construction and demolition';
C. be at least 'air quality neutral' and not lead to further deterioration of existing poor air quality (such as areas Designated as Air Quality Management Areas (AQMAs);

D. ensure that where provision needs to be made to reduce emissions from a development, this is usually made On-site. Where it can be demonstrated that on-site provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approach; and

E. where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified."

Revised Early Minor Alterations to the London Plan, 2012

11.17. There are no alterations to the air quality policy summarised above in the Revised Early Minor Alterations to the London Plan[12].

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

11.18. Policy DM34: Healthy Development of the LBI Development Management Policies[13] states that:

"…E. Developments in locations of poor air quality should be designed to mitigate the impact of poor air quality to within acceptable limits. Where adequate mitigation is not provided and/or is not ptactical planning permission may be refused.

F. Developments should not cause significant harm to air quality, cumulatively or individually. Where modelling indicates significant harm would be caused this shall be fully addressed through appropriate mitigation."

London Borough of Islington's Site Allocations Submission, 2012

11.19. There are no policies within the LBI Site Allocations Submission[14] that relate to air quality.

London Borough of Islington's Finsbury Local Plan Submission, 2012

11.20. There are no policies within the Finsbury Local Plan Submission [15] that relate to air quality

London Borough of Islington Core Strategy, 2011

11.21. There are no policies contained within the LBI Core Strategy16 that relate directly to air quality.

London Borough of Islington Unitary Development Plan, (Saved Policies), 2002

11.22. The LBI Unitary Development Plan (UDP) was adopted in 2002[17]. It has been partly superseded by LBI's Core Strategy but contains a number of 'saved' policies which will continue to be used until the adoption of other LDF documents. Policy Env 16: 'Protecting Amenity' states that:

"The Council is concerned that the air and water quality in Islington is the highest possible. In considering development proposals it will:

i) seek to prevent the pollution of the water resources of the Borough, including all surface and underground sources;

ii) avoid detrimental alterations to air quality and microclimate;

iii) minimise light pollution.

Wherever possible the Council will also seek improvements to air and water quality."

11.23. Policy Env 17: 'Protecting Amenity' states:

"When considering applications for new developments and changes of use, the Council will seek to protect or enhance the amenities of the area. In particular:

i) planning permission will not be granted to developments which cause unacceptable levels of noise, smell, smoke, air pollution, vibration, danger or other forms of disturbance or nuisance, either directly or as a result of the traffic generated by the scheme;

ii) planning applications for all new development, particularly residential uses, which will be exposed to an existing or potential noise source, should demonstrate how this situation will be taken into account to protect potential occupiers;

iii) planning permissions which are granted may include conditions relating to:

a) the layout, design and/or operation of machinery in order to distance, screen or suppress noise making operations;

b) the need for a high level sound insulating barrier within the building structure;

c) controls on the operating hours of disturbing operations;

d) the inclusion of suitable soundproofing, ventilation ducting and filtering processes;

iv) planning permissions will require that appropriate servicing and refuse storage facilities are provided, and that these are suitably located to minimise nuisance."

11.24. Policy Env 18: 'National Air Quality Strategy' states:

"The Council is committed to implementing the National Air Quality Strategy, and intends to reach the National Air Quality Objectives as specified in the Air Quality Regulations 2000."

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

11.25. The LBC Site Allocations Document[18] states that:

"As set out in the Core Strategy, the Council will support and promote the Central London area of Camden as a successful and vibrant part of the capital to live in, work in and visit.We will:

…continue to designate Central London as a Clear Zone Region to reduce congestion, promote walking and cycling and improve air quality."

London Borough of Camden Core Strategy 2010-2025, 2010

11.26. The LBC Core Strategy[19] sets out the key elements of the Councils vision for the Borough. Policy CS9: 'Achieving a successful Central London' states:

"The Council will support and promote the Central London area of Camden as a successful and vibrant part of the capital to live in, work in and visit. We will:

…k) continue to designate Central London as a Clear Zone Region to reduce congestion, promote walking and cycling and improve air quality;"

11.27. Policy CS16 - Improving Camden's health and well-being states:

"The Council will seek to improve health and well-being in Camden. We will:

…e) recognise the impact of poor air quality on health and implement Camden's Air Quality Action Plan which aims to reduce air pollution levels."

London Borough of Camden Development Policies 2010-2025, 2010

11.28. The LBC Development Policies 2010-2025[20] sets out the detailed planning criteria that LBC will use to determine applications for planning permission in the Borough. Policy DP32: 'Air quality and Camden's Clear Zone' states:

"The Council will require air quality assessments where development could potentially cause significant harm to air quality. Mitigation measures will be expected in developments that are located in areas of poor air quality.

The Council will also only grant planning permission for development in the Clear Zone region that significantly increases travel demand where it considers that appropriate measures to minimise the transport impact of development are incorporated. We will use planning conditions and legal agreements to secure Clear Zone measures to avoid, remedy or mitigate the impacts of development schemes in the Central London Area."

Mount Pleasant Supplementary Planning Document, 2012

11.29. LBI and LBC have prepared the Mount Pleasant Supplementary Planning Document[21] (SPD) which sets out how the Site should be developed in the future. The document sets out a number of key objectives, although there are none that relate to air quality.

Guidance

The Mayor's Air Quality Strategy 'Clearing the Air', 2010

11.30. The Greater London Authority (GLA) Act 1999 requires the GLA to produce an Air Quality Strategy[22] for Greater London that sets out air quality objectives (to be no less than national objectives), assess, present and forecast future air quality, and present measures the Mayor, GLA and other functional bodies (e.g. London Boroughs and LPAs bordering London) will take towards meeting these objectives. As such, the objectives of the Mayor's Strategy will be met if the national objectives are met.

11.31. The current Mayor's Air Quality Strategy was adopted in 2010[23] and sets out a framework for delivering improvements to London's air quality. Such measures are aimed at reducing emissions from transport, homes, offices and new developments, as well as raising awareness of air quality issues.

The Mayor's Supplementary Planning Guidance - Sustainable Design and Construction, 2006

11.32. The Supplementary Planning Guidance (SPG) on Sustainable Design and Construction[24] provides additional information to support the implementation of the adopted London Plan and sets out what can be done within the current policy framework to design and construct new developments in ways that contribute to sustainable development. The SPG focuses on the aspects of design and construction that relate to a specific site, rather than to the wider context of the area.

11.33. In relation to air pollution, low emission developments that are designed to minimise the air quality impact of plant, vehicles and other sources over the lifetime of the development are encouraged. Key principles include ensuring that building services plant has the lowest emissions practicable, and taking measures to reduce and mitigate exposure to air pollution.

Mayor of London Best Practice Guidance - The Control of Dust and Emissions from Construction Sites, 2006

11.34. The best practice guidance set out in 'The Control of Dust and Emissions from Construction Sites'[25] provides a consistent approach covering all aspects of dust control and emissions from construction and demolition activities.

11.35. This guidance builds on Building Research Establishment (BRE) Guidance[26] and individual LPA's Considerate Contractors' Schemes, together with the experience of LPA officers. It establishes best practice and control measure packages that are relevant and achievable, with the overarching aim of protecting public health. It also aims to provide an overall mechanism to deal with the cumulative impacts of the many individual construction sites within a London borough.

11.36. This guidance builds on, and aims to replace or amend relevant parts of an individual borough's existing Code of Construction Practice documents.

London's Low Emission Zone, 2008

11.37. On 3 May 2007, the Mayor confirmed the introduction of the London Low Emission Zone (LEZ). The LEZ covers most of Greater London. This decision was taken following the publication of the Mayor's revisions to the Transport and Air Quality Strategies in July 2006. All roads (including those at Heathrow and the M1 and M4 motorways, except the M25) fall within the zone. Phased introduction of the LEZ scheme started on 4 February 2008 and will be gradually implemented through to January 2012. The LEZ is a specified area within which the most polluting diesel-engined trucks, buses, coaches, large vans and minibuses will be required to meet specified Euro emissions targets. Where such vehicles do not meet the specified emission targets, a charge will be levied. From the 3 January 2012 the LEZ became more stringent with vehicles required to meet the Euro IV standard for particulate matter.

Low Emission Strategies – Good Practice Guide, 2010

11.38. In January 2010, DEFRA published Good Practice Guidance[27] for advising LPA's on ways in which the planning system may be used to reduce transport emissions and thus improve air quality. The guidance provides LPAs with typical measures and examples of good practice including:

- On-site parking - residential / customer parking spaces set aside for car clubs or low emission vehicles;
- Low emission infrastructure – provision of providing electric charging bays or low emissions fuelling points, cycle rental schemes, development and promotion of car clubs;
- Innovative and creative ideas;
- Commitments via procurement and supply chains; and
- Contributions to local plans – standardised for all developments over a certain threshold but related to the actual impact.

London Borough of Islington Air Quality Action Plan, 2003

11.39. The LBI Air Quality Action Plan[28] contains a comprehensive series of measures that aim to reduce the pollution emitted from vehicles and to reduce the amount of traffic on the roads. These measures are split up into a number of action areas:

- Zoning – Low Emission Zone; Freight Management; Reduced speed residential traffic zones and Reducing congestion;
- Public Transport – Improve and Increase Bus Travel; Support extensions to Underground and national railways networks;
- Charging and Enforcement – Carry out random roadside emissions tests, variable parking charges based on engine type in controlled parking zones;
- Infrastructure – Encourage the provision of natural gas and LPG at petrol stations within the Borough, install a LPG station for Council vehicles at Lough Road, Promote programme of traffic management and claming schemes, Improve cycle and walking provision;
- Schemes – LBI will continue to seek to implement its traffic reduction strategy, Green travel plans for employees and schools, reduce emissions from the Council's own fleet;
- Traffic Management – LBI will seek to increase the use of Controlled Parking Zones in the Borough;
- Industrial Emissions – LBI will encourage large commercial premises using oil for heating purposes to switch to gas
- Domestic Emissions – take action against persons refusing to comply with smoke control areas, promote energy efficiency in development projects through planning guidance

London Borough of Islington Code of Practice for Construction Sites

11.40. LBI's Code of Practice for Construction Sites[29] provides a guide for developers, contractors, community groups and commercial users on good environmental practice. The document provides a number of actions as set out in the BRE guidance[26] that should be considered to reduce the impact of construction sites on air pollution and dust.

London Borough of Camden Air Quality Action Plan Report 2009-2012, 2009

11.41. The LBC Air Quality Action Plan[30] (AQAP) sets out a number of measures to deliver improvements to air quality within the Borough. The Plan comprises four themes which are:

- *"Reducing transport emissions;*
- *Reducing emissions associated with new development;*
- *Reducing emissions from gas boilers and industrial processes; and*
- *Air quality awareness raising initiatives."*

11.42. Within each of these themes are a number of objectives and actions LBC will take to reduce emissions within the Borough.

London Borough of Camden Guide for Contractors Working in Camden, 2008

11.43. LBC have produced a guide[31] to reduce disturbances due to dust and smoke arising from demolition and construction work on all building sites within the borough. The document sets out Best Practice Means (BPM) to mitigate dust emissions from construction sites these include:

"a. Carry out demolition and construction work in accordance with the Best Practise Guid-ance Note 'The control of dust and emissions from construction and demolition' (2006). This outlines BPM to effectively manage construction work in order to mitigate air pollu-tion emissions.

b. When carrying out demolition or construction work during periods of dry or windy weather, there can often be dust problems on sites bordered by homes. You must take measures to reduce the formation and spread of dust. You must control dust at source by using a continuous fine-water spray. You must provide a suitable water supply, and make sure there are enough hoses to reach all parts of the site and a way of getting rid of wastewater.

c. There must be adequate screening and damping down during all demolition activities, sandblasting, clearance work, breaking up of existing ground services and other site preparations and activities. You must use existing features of the site, such as boundary walls to provide screening where practicable.

d. You must enclose scaffolding with appropriate sheeting material.

e. You must provide easy-to-clean hard-standings for vehicles.

f. You must keep heavily used areas clean by brushing vehicles and spraying them with water regularly.

g. You must control the cutting or grinding of materials on the site.

i. Buildings or structures that are being demolished, or small areas of land that are being prepared for development must be damped down using high-pressure hoses.

k. On sites where a large amount of dust has been produced and is laying on the ground, you must use a specialist vehicle to remove dust (by vacuuming) before you damp down the site.

l. Major haul routes on the site must be watered as necessary to reduce dust. Where practical, you must compact the route to reduce the amount of soil and other material that is moved around the site. This applies especially near to exits. If machinery move-ments produce dust, you must set effective speed limits and reschedule work if neces-sary. If the development involves machinery moving across open land, you must create a suitable track to reduce the amount of dust produced.

m. You must enclose materials at all times, and damp down dusty materials using water sprays during dry weather.

n. All materials that create dust, including soil, must be stored away from the site bound-ary, screened to prevent wind spreading the dust and damped down where practical. You will need to consider the size and shape of stockpiles to reduce dust.

o. Paved roads near to exits must be kept clean. Vehicles transporting materials onto or off the site must be suitably covered where necessary to prevent dust.

p. You must use rubble chutes and skips where appropriate. There must be an effective close-fitting cover over the skip to contain all the dust and other rubbish. The chutes must be continuous until they reach the skip, with no gaps, and maintained in good con-dition.

q. *You must not allow rubbish and waste materials to build up on the site.*

r. *You must plant, turf or securely cover completed earthworks to stabilise the surface.*

s. *Reducing dust, fumes or other nuisance or environmental effects, which may cause offence to the local community or environment.*

t. *Reduce environmental effects which may cause offence to the local community by promoting proactive community relations."*

Assessment Methodology and Significance Criteria

Assessment Methodology

11.44. This air quality assessment was undertaken using a variety of information and procedures as follows:

- Consultation with LBI and LBC to agree the methodology to be used within the assessment;
- A review of LBI and LBC's air quality review and assessment documents in order to quantify baseline conditions in the area of the Site;
- Three-months NO_2 diffusion tube monitoring at the Site from October 2012 to January 2013 to establish Site-specific air quality conditions, presented in Appendix 11.1;
- Review of the local area to identify potentially sensitive receptor locations that could be affected by changes in air quality that result from each Development Scenario;
- Traffic flow data from the transport consultant for the project, SKM Colin Buchanan ;
- Application of atmospheric dispersion modelling using the ADMS-Roads model[32] to predict the likely pollutant concentrations at the Site and the effect of each completed Development Scenario on local air quality in terms of traffic, car park and heating plant emissions generated. The latest NO_2 from NO_X Calculator (Version 3.2, September 2012) available from the DEFRA website has been applied to derive the road-related NO_2 emissions from the NO_X outputs;
- Comparison of the predicted air pollutant concentrations with results from the diffusion tube monitoring study undertaken by Waterman (Appendix 11.1), the UK air quality objectives and the EPUK significance criteria;
- Consideration of potential construction activities and the environmental management controls likely to be employed during the construction phase of the works;
- Assessment of the proposed heating plant and car parks within each completed Development Scenario; and
- Identification of mitigation measures where appropriate.

11.45. The UK AQS identifies the pollutants associated with road traffic emissions and local air quality as nitrogen oxides (NO_X), particulate matter (as PM_{10} (particles with a diameter up to 10µm) and $PM_{2.5}$ (particles with a diameter up to 2.5µm), carbon monoxide (CO), 1,3-butadiene and benzene. Emissions of total NO_X from motor vehicle exhausts comprise nitric oxide (NO) and NO_2. NO oxidises in the atmosphere to form NO_2.

11.46. The most significant pollutants associated with road traffic emissions, in relation to human health, are NO_2 and particulate matter. LBI and LBC have declared AQMAs within their Boroughs for NO_2 and PM_{10}, attributable to road traffic emissions (discussed further in the Baseline Conditions section). The assessment will therefore focus on NO_2 and particulate matter.

11.47. As outlined in Chapter 2: EIA Methodology the EIA was based on the likely future baseline conditions of the Site and surrounding area, whereby it was assumed that the modernisation of

the adjacent Mount Pleasant Sorting Office will be completed prior to any development on the Site is started. The modernisation works will result in intensification of operations at the Mount Pleasant Sorting Office, including additional traffic movements. The intensification of operations at the Mount Pleasant Sorting Office would therefore have the potential to increase air pollutants at and surrounding the Site. In terms of air quality, baseline information is obtained from a review of LBI and LBC's air quality review and assessment documents and local monitoring data. The latest monitoring data available are for the year 2012 (see Future Baseline Conditions Section below) which is prior to the modernisation/intensification works. Therefore, it is not possible to quantitatively capture the future baseline in terms of monitored/measured air quality.

11.48. As outlined below, under the Completed Development methodology section, the assessment of effects on air quality is based on a comparison between the 'with Development' and 'without Development' situations, as is standard best practice for such assessment. The effect of the modernisation works, in terms of traffic and thus air quality, are taken into account in the traffic data relating to the future (2018 and 2020) 'without Development' scenarios used in the ADMS-Roads modelling. Therefore, it is not necessary to quantitatively capture the future baseline in terms of air quality and this is not a limitation to the air quality assessment.

Demolition and Construction

11.49. The major influences on air quality throughout the demolition and construction works associated with each Development Scenario are likely to be dust-generating activities and vehicles emissions, from plant and vehicles both on and around the Site. The emphasis of the construction works would be to minimise the potential effects at source, through appropriate site management and control practices, including controls on vehicle movements.

11.50. Potentially, nuisance can be caused by the deposition of construction dust. Construction derived dust effects cannot be easily quantified and therefore a more qualitative approach was employed to predict potential effects from these works. The emphasis of this approach lies in the minimisation of potential dust effects at source through appropriate environmental management controls relating to, at least, 'good practice' site management practices. In particular, this included:

- Identification of good working practices and suitable mitigation measures in order to minimise the potential for dust emissions, and nuisance risk; and;
- The likely generation of construction vehicle movements.

11.51. Premises and occupants within 100m of a construction site are generally considered to experience the most significant effects from construction dust. Examples of dust-sensitive receptors are listed in Table 11.2[33].

Table 11.2: Dust Sensitive Receptors

High Sensitivity	Medium Sensitivity	Low Sensitivity
Hospitals and Clinics	Schools	Farms
Retirement Homes	Residential Areas	Light and Heavy Industry
Hi-Tech Industries	Food Retailers	Outdoor Storage
Food Processing	Offices	

11.52. The proximity of sensitive receptors and their orientation in relation to the prevailing wind, in addition to the scale and duration of demolition and construction activities, would have a bearing on potential dust nuisance effects.

Completed Development

11.53. The effect on local air quality in relation to each completed Development Scenarios was assessed using the advanced atmospheric dispersion model, ADMS-Roads, as agreed with the Environemntal Health Officer (EHO) at LBI and LBC. This included the effect of traffic generated by the Development Scenario on the surrounding road network, emissions relating to proposed car parks and heating plant emissions. Appendix 11.2 presents the details of the ADMS-Roads modelling.

11.54. Traffic data for the local road network were provided by SKM Colin Buchanan (see Appendix 11.2 for further details). The baseline year of 2012 was assessed and the 'without Development' and 'with Development' scenarios for the year 2018, to represent the anticipated year of completion of Development Scenario 2 and Development Scenario 3 and for the year 2020, to represent the anticipated year of completion of Development Scenario 1, were assessed The traffic data was used within the ADMS-Roads model to assess the potential for significant effects from additional traffic movements generated by each Development Scenario on future local air quality.

11.55. SKM also provided traffic data in relation to the existing and proposed car parks and service yard as follows:

- The existing Royal Mail staff car park, Royal Mail car park and service yard located on the Phoenix Place site and Calthorpe Street site respectively;
- The relocated Royal Mail car park and service yard to the Mount Pleasant Sorting Office as part of the enabling works; and
- The proposed car parks located within the basements of the Calthorpe Street Development and Phoenix Place Development.

11.56. Information relating to how these car parks and service year were included within the ADMS-Roads model is provided in Appendix 11.2.

11.57. The year 2012 was used as the verification year, and therefore the baseline year, within the assessment, because the estimated annual mean monitoring data calculated following guidance in LAQM.TG(09), from the short term monitoring study (refer to Appendix 11.1), represents the year 2012. A summary of the short-term monitoring study is provided later in this Chapter and the full report is presented in Appendix 11.1 which includes details of the annualisation of the monitoring data.

11.58. Emission data relating to the proposed energy plant for the Development Scenarios, to be located within the basement of Building A on the Phoenix Place site and within the basement of Building H of the Calthorpe Street site, were provided by Hoare Lea (the energy consultants for the project) (see Appendix 11.2 for further details).

11.59. The operational traffic, car park and heating plant data was used within the ADMS-Roads model to assess the potential for significant effects from additional traffic movements and heating plant emissions generated by each Development Scenario on future local air quality.

11.60. The ADMS-Roads dispersion model predicts how emissions from roads and small-scale industrial sources combine with local background pollution levels, taking account of meteorological conditions, to affect local air quality. The ADMS-Roads model has been run for the completion years, 2018 and 2020, and therefore used 2018 and 2020 background data and 2018 and 2020

vehicle emission rates as inputs. For the verification assessment in 2012 (refer to later in this Chapter), 2012 background data and 2012 vehicle emission rates have been used, which would be higher than the 2018 and 2020 data. The model output allows pollution levels to be quantified at a number of specific receptor locations which facilitates the assessment of effects at potentially sensitive receptor locations.

11.61. The assessment of effects on air quality presented within this Chapter are based on a comparison between the 'with Development' and 'without Development' situations in the revelant anticipated years of completion.

11.62. Full details of the ADMS-Roads modelling study, including the heating plant, car park and traffic data used in the assessment, are presented within Appendix 11.2.

Model Uncertainty

11.63. Recent analyses of historical monitoring data by DEFRA has identified a disparity between measured NO_X and NO_2 concentrations and the projected decline associated with emission forecasts which form the basis of air quality modelling as described above[34]. The precise reason for the disparity is not fully understood but is thought to be related to the on-road performance of certain vehicles compared to calculations based on Euro standards which inform emission forecasts.

11.64. A recent DEFRA Note on 'Projecting NO_2 Concentrations'[35] provides a number of alternative approaches that can be undertaken by LPAs within their review and assessment process in relation to concerns about future NO_2 concentrations. This includes the use of revised background maps, alternative projection factors and revised emission factors. However, the DEFRA Note does not form part of statutory guidance and no prescriptive method is recommended for use in an air quality assessment.

11.65. This air quality assessment was based on current guidance, i.e., with reduced emission rates and background concentration to the completion years of 2018 and 2020. However, in addition, a sensitivity analysis was undertaken on the basis of no future reductions (i.e. considering the potential effect of the Development Scenarios against the 2012 conditions). The sensitivity approach presented in this air quality assessment has been agreed with and accepted by many LPAs and provides a clear method for quantifying the uncertainty in future NO_X and NO_2 concentrations with the Development Scenarios. The sensitivity analysis presents the worst case results assuming no projected decline in NO_X and NO_2 concentrations from technological advances in vehicle emissions. The sensitivity analysis is presented in Appendix 11.2.

Pollutant Background Concentrations

11.66. The ADMS-Roads model requires the use of background pollutant concentration data to which the model adds contributions from nearby roads and small-scale industrial plant. Full details in relation to the background data used within the air quality assessment are included in Appendix 11.2.

Model Verification

11.67. Model verification is the process of comparing monitored and modelled pollutant concentrations in order to give confidence in the accuracy of the modelling results. The model was verified by comparing the modelled annual mean NO_2 concentrations for 2012, with the monitoring undertaken by Waterman EED at the Site. Details of the monitoring are presented in Appendix 11.1. The verification and adjustment process is described in detail in Appendix 11.2.

Potentially Sensitive Receptors

11.68. The approach adopted by the Air Quality Strategy is to focus on areas at locations close to, or at, ground level where members of the public (in a non-workplace area) are likely to be exposed over the averaging time of the objective in question (i.e. over 1-hour, 24-hour or annual periods). Objective exceedences principally relate to annual mean NO_2 and PM_{10}, and daily mean PM_{10} so that potentially sensitive locations relate mainly to residential properties and other sensitive locations (such as schools) where the public may be exposed for prolonged periods.

11.69. Table 11.3 presents existing potentially sensitive receptors (residential properties) that have been selected owing to their proximity to the road network that may be affected by the Development Scenarios.

11.70. Locations which are representative of sensitive uses proposed within the Entire Development (i.e. proposed residential locations) were also considered (Receptors 6 to 13). These represent areas of the Entire Development that are likely to be exposed to the worst-case air quality conditions, i.e. the lowest levels of the Entire Development, where residential receptors are present, that would be the nearest to road traffic, and the nearest receptors (residential and office) to the heating plant emissions. The locations of proposed receptors assessed at varying heights across the Site are presented in Appendix 11.2. All receptor locations are presented in Figure 11.1.

Table 11.3: Selected Receptor Locations

Receptor Number	Address of Receptor	Grid Reference	Height (m)
1	1st Floor Flat, 88-90 Farringdon Road	531215, 182331	3
2	1st Floor Flat, 106 Farringdon Road	531187, 182365	3
3	Ground Floor Flat, 132a Farringdon Road	531115, 182438	0
4	43 Calthorpe Street	530962, 182404	0
5	Flat above Apple Tree Public House	531669, 182206	3
6	**Proposed:** Building D North Façade (Lower Ground Floor)	530898,182327	0
7	**Proposed:** Building A Phoenix Place Façade (Lower Ground Floor)	531025, 182230	0
8	**Proposed:** Building G Farringdon Road Façade (1st Floor) (Office)	531070, 182449	5.1
9	**Proposed:** Building K (Ground Floor)	530966, 182391	0
10	**Proposed:** Building J Calthorpe Street Façade (Ground Floor)	530941, 182429	0
11	**Proposed:** Building H Farringdon Rd/Calthorpe Rd Façade (Ground Floor)	531009, 182501	0
12	**Proposed:** Building A Mount Pleasant Façade (13th Floor)	531008, 182159	44.9
13	**Proposed:** Building G Farringdon Road Façade (6th Floor) (Office)	531070, 182449	24.4

Significance Criteria

Demolition and Construction

11.71. The assessment of demolition and construction effects has been based on:

- Consideration of likely demolition and construction activities; and
- A review of the sensitive uses in the area immediately surrounding the Site in relation to their distance and orientation.

11.72. The significance of effect has been concluded through professional judgement based on the following:

- The baseline air quality conditions in the area surrounding the Site;
- The mitigation measures that would be proposed; and
- The knowledge of how such mitigation measures are routinely and successfully applied to construction projects throughout the UK.

11.73. In addition to the above, the classification system provided in Table 11.4 was adopted, again based on professional judgement, for the assessment of potential adverse air quality effects arising from dust generated by demolition and construction activities associated with each Development Scenario.

Table 11.4: Construction Significance Criteria

Effect Significance	Definition
Substantial adverse	Receptor is less than 10m from a major active construction or demolition site.
Moderate adverse	Receptor is 10m to 100m from a major active construction or demolition site, or up to 10m from a minor active construction or demolition site.
Minor adverse	Receptor is between 100m and 200m from a major active construction or demolition site or 10m to 100m from a minor active construction site or demolition site.
Negligible	Receptor is over 100m from any minor active construction or demolition site or over 200m from any major active construction or demolition site.

Completed Development

11.74. The significance of any changes in local air quality that are predicted, based on background pollutant concentrations and predicted traffic flows, can be established through the consideration of the following factors:

- Geographical extent (local, district or regional);
- Duration (temporary or long term);
- Reversibility (reversible or permanent);
- Magnitude of pollutant concentration changes;
- Exceedence of standards (e.g. Air Quality Strategy objectives); and
- Changes in pollutant exposure.

11.75. The Environmental Protection UK Guidance 'Development Control: Planning for Air Quality (2010) Update' provides an approach to defining magnitude of changes and describing the air quality impacts at specific receptors recommended by the Institute of Air Quality Management (IAQM).

11.76. Table 11.5 below presents the magnitude of change descriptors, based on the change in concentration predicted to be brought about by a scheme as a percentage of the assessment level (i.e. the UK Objective, Limit Value of Environmental Assessment Level). Tables 11.6 and 11.7 present the effect significance descriptors that take account of the magnitude of changes (both positive and negative) given in Table 11.5, and the concentration in relation to the air quality objective. The term 'slight' has been replaced with the term 'minor' to be consistent with the scale of significance detailed in Chapter 2: *EIA Methodology*.

Table 11.5: Magnitude of Change Descriptor in Relation to Changes in Concentrations of NO_2 and PM_{10}

Magnitude of Change	Annual Mean NO_2 / PM_{10}	Days PM_{10}> 50µg/m^3
Large	Increase/decrease > 10% (>4µg/m^3)	Increase/decrease >4 days
Medium	Increase/decrease 5-10% (2-4µg/m^3)	Increase/decrease 2-4 days
Small	Increase/decrease 1-5% (0.4-2µg/m^3)	Increase/decrease 1-2 days
Imperceptible	Increase/decrease < 1% (<0.4µg/m^3)	Increase/decrease <1 days

Note: Percentage calculated as a change of the level of assessment

Table 11.6: Effect Significance Criteria for Annual Mean NO_2 and PM_{10}

Concentration in Relation to Standard	Small	Medium	Large
Decrease with Development			
Above objective ***without*** development (>40µg/m^3)	**Minor beneficial**	**Moderate beneficial**	**Substantial beneficial**
Just below ***without*** development (36-40µg/m^3)	**Minor beneficial**	**Moderate beneficial**	**Moderate beneficial**
Below objective ***without*** development (30-36µg/m^3)	**Negligible**	**Minor beneficial**	**Minor beneficial**
Well below objective ***without*** scheme (<30µg/m^3)	**Negligible**	**Negligible**	**Minor beneficial**
Increase with Development			
Above objective ***with*** development (>40µg/m^3)	**Minor adverse**	**Moderate adverse**	**Substantial adverse**
Just below ***with*** development (36-40µg/m^3)	**Minor adverse**	**Moderate adverse**	**Moderate adverse**
Below objective ***with*** development (30-36µg/m^3)	**Negligible**	**Minor adverse**	**Minor adverse**
Well below objective ***with*** scheme (<30µg/m^3)	**Negligible**	**Negligible**	**Minor adverse**

Note: an imperceptible change would be described as 'negligible'

Table 11.7: Effect Significance Criteria for PM_{10} Daily Mean

Concentration in Relation to Standard	Small	Medium	Large
Decrease with Development			
Above objective ***without*** development (>35days)	**Minor beneficial**	**Moderate beneficial**	**Substantial beneficial**
Just below ***without*** development (32-35 days)	**Minor beneficial**	**Moderate beneficial**	**Moderate beneficial**
Below objective ***without*** development (26-32 days)	**Negligible**	**Minor beneficial**	**Minor beneficial**
Well below objective ***without*** scheme (<26 days)	**Negligible**	**Negligible**	**Minor beneficial**
Increase with Development			
Above objective ***with*** development (>35days)	**Minor adverse**	**Moderate adverse**	**Substantial adverse**
Just below ***with*** development (32-35 days)	**Minor adverse**	**Moderate adverse**	**Moderate adverse**
Below objective ***with*** development (26-32 days)	**Negligible**	**Minor adverse**	**Minor adverse**
Well below objective ***with*** scheme (<26 days)	**Negligible**	**Negligible**	**Minor adverse**

Note: an imperceptible change would be described as 'negligible'

11.77. There are no significance criteria for the new $PM_{2.5}$ exposure reduction objective.

Future Baseline Conditions

11.78. The baseline conditions described below summarise a review of LBI and LBC's air quality review and assessment documents and monitoring data within the Boroughs. The intensification of operations at the Mount Pleasant Sorting Office would have the potential to generate additional traffic and thus to increase air pollutants at and surrounding the Site. As outlined in the Assessment Methodology section above, this additional traffic has been included in the traffic data used in the assessment of each 'without Development' situation in 2018 and 2020. Therefore, it is not necessary to quantitatively capture this modernisation and intensification below, and it is not possible to in terms of monitored/measured air quality, as outlined in the Assessment Methodology section above.

London Borough of Islington Review and Assessment

11.79. In August 2000 LBI completed the third stage of its review and assessment of air quality and found that the annual and hourly mean objectives for NO_2 and the annual and daily mean objectives for PM_{10} were not going to be achieved. Consequentially, an AQMA was declared covering a large part of the Borough. As a result of work undertaken in the 2003 Further Assessment of NO_2[36] the AQMA was extended to cover the entire Borough.

11.80. The 2006 Updating and Screening Assessment (USA)[37], confirmed that the objectives for CO, benzene, 1,3-butadiene, lead and sulphur dioxide (SO_2) would not be exceeded. The 2005 monitoring data also indicated that the 24 hour and annual mean objectives for PM_{10} had also been met. However, LBI decided to retain the AQMA as evidence showed that a repeat in the meteorological conditions of 2003 could result in an exceedance of this objective. The annual mean objective for NO_2 was not met in 2005 although the number of exceedances at background locations appeared to be decreasing while at roadside locations it was increasing. The AQMA was retained for both annual and hourly objectives for NO_2.

11.81. The 2009 USA[38] found there to be a steady decrease in emissions. However, the objective for NO_2 was still being exceeded. The 2011 Progress Report[39] also concluded that the AQMA should be retained.

11.82. The Calthorpe Street site is located in the LBI AQMA.

London Borough of Camden Review and Assessment

11.83. Between 1998 and 2001 LBC undertook the first round of review and assessment of air quality[40] which concluded that it was necessary to declare the entire Borough as an AQMA for the annual mean objective for NO_2 and the 24-hour and annual mean objectives for particulate matter PM_{10}.

11.84. The USAs completed in August 2003[41], 2006[42] and 2009[43] concluded that the LBC AQMA designation should remain and no further 'Detailed Assessment' for air quality were required.

11.85. The fourth round of review and assessment[44] identified that the Borough no longer exceeded the 24-hour and annual mean objectives for PM_{10} at three of their automatic monitoring sites. Although LBC attributed this to the change in the methodology used to measure PM_{10} concentrations rather than improvements in emissions. LBC does not intend to change the AQMA order but will review the situation over the next five years in line with future trends in PM_{10} concentrations.

11.86. The fourth round of review and assessment additionally indicated that a number of diffusion tube sites and one automatic site at roadside locations exceeded the hourly mean NO_2 objective. LBC undertook further modelling work to understand the spatial distribution of PM_{10} and NO_2 exceedances across the Borough. The modelling revealed that a number of roads in Camden which experience high volumes of traffic and a large proportion of HGV vehicles exceeded the short and long term PM_{10} and NO_2 objectives.

11.87. The Phoenix Place site is located within the LBC AQMA.

Local Planning Authority Monitoring

11.88. LBI undertakes monitoring at two automatic monitoring locations and twenty-one diffusion tube locations across the Borough. LBC undertakes monitoring at three automatic monitoring locations and fourteen diffusion tube locations across the Borough. The nearest automatic monitor to the Site is located at an Urban Background site in Bloomsbury approximately 0.9km southwest and is operated by LBC.

11.89. The most recent annual mean monitoring data from the automatic monitor at Bloomsbury are presented in Table 11.8. The most recent annual mean NO_2 concentrations measured at the five nearest diffusion tubes to the Site are presented in Table 11.9.

Table 11.8: Monitored Annual Mean NO_2 Concentrations (µg/m^3) at the Bloomsbury Automatic Monitor Operated by LBC

Pollutant	Averaging Period	AQS Objective	Year		
			2009	2010	2011
NO_2	Annual Mean (µg/m^3)	40µg/m^3	**54**	**55**	**50**
	Hourly (No. of hours)	200µg/m^3 not to be exceeded more than 18 times a year	2	1	0
PM_{10}	Annual Mean (µg/m^3)	40µg/m^3	23	18	23
	No. of Days	50µg/m^3 not to be exceeded more than 35 times per year	15	2	17

Source: www.londonair.org.uk

Exceedence of the AQS Objective indicated in **Bold**

Table 11.9: Diffusion Tube Monitored Annual Mean NO_2 Concentrations (µg/m^3), LBC and LBI

Site I.D.	Local Authority	Type	Distance from Site (km)	AQS Objective	2010	2011
BIS/04 Percy Circus	Islington	Urban Background	0.6	Annual Mean 40µg/m^3	**47.7**	-
CA6 Wakefield Gardens	Camden	Urban Background	0.61		34.0	**45.61**
BIS/02 Roseberry Avenue	Islington	Roadside	0.8		**71.7**	-
BIS/05 Myddleton Square	Islington	Urban Background	0.8		**45.5**	-
CA4 Euston Road	Camden	Roadside	1.1		**82.0**	**93.12**

Source: LBI Air Quality Progress Report 2011; 2010 Air Quality Progress Report for the London Borough of Camden; 2011 data supplied by LBC. 2011 data has not been supplied by LBI
Exceedence of the AQS Objective indicated in **Bold**

11.90. The monitoring results in Table 11.8 indicate that the annual mean NO_2 objective of 40µg/m^3 is exceeded at the Urban Background Bloomsbury automatic monitor. The hourly mean NO_2 objective and the annual mean and daily mean PM_{10} objectives have been met at the monitoring location between 2009 and 2011.

11.91. The monitoring results in Table 11.9 indicate that the annual mean NO_2 objective of 40µg/m^3 is exceeded at all monitor locations apart from the Wakefield Gardens diffusion tube in 2010. This agrees with LBI and LBC's designated AQMAs.

Waterman Short-term Local Monitoring

11.92. A short term (three month) diffusion tube monitoring study was undertaken by Waterman EED between October 2012 and January 2013 to establish current air quality conditions at, and surrounding, the Site. Duplicate diffusion tubes were located on street furniture at five locations on and around the Site and triplicate tubes were co-located with the Euston Road automatic monitor to allow bias adjustment of the results. Estimated annual mean results were then calculated on the basis of LAQM.TG(09) guidance[45]. Appendix 11.1 provides the full details of the monitoring study including a figure of the monitoring locations and results are presented in Table 11.10.

Table 11.10: Site Specific Monitoring Results for Nitrogen Dioxide (µg/m^3) for 2012

Site ID	Estimated 2012 Annual Mean
1. Gough Street (Phoenix Place site)	54.6
2. Phoenix Place (Phoenix Place site/Calthorpe Street site)	54.8
3. Calthorpe Street (Calthorpe Street site)	53.6
4. Farringdon Road A (Calthorpe Street site)	65.5
5. Farringdon Road B (Calthorpe Street site)	56.5

11.93. The estimated annual mean monitoring data have been calculated following guidance in LAQM.TG(09). This uses the most recent annual mean monitoring data from other long-term monitoring sites in the estimation process, which at the time of the monitoring study was 2012. Therefore the monitoring data represents 2012 data (see Appendix 11.1 for more details).

11.94. The results of the monitoring study in Table 11.10 indicate that the estimated annual mean NO_2 concentrations at the Phoenix Place and Calthorpe Street sites are above the annual mean objective value of 40µg/m^3 at all the monitoring locations. Concentrations measured at Diffusion Tube 4 located on Farringdon Road are higher than the concentrations measured at the other four monitoring locations as this tube is located at the traffic light junction between Calthorpe Street and Farringdon Road.

Potential Effects

Demolition and Construction

Nuisance Dust

Development Scenario 1

11.95. Given the size of the Entire Development (35,000 sq m) and the time over which it is expected to be built (Development Scenario 1 to be constructed over 5 years and complete by 2020), it is considered to be a major construction site, as per the criteria in Table 11.2. In addition, the Entire Development Site would be classed as a 'High' risk site by the GLA 'Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance'[25] owing to its size (over 15,000 sq m and over 150 properties) and it being a Major Development referable to the Mayor.

11.96. The demolition and construction works in relation to Development Scenario 1 have the potential to effect local air quality conditions, as follows:

- Dust generated from demolition and construction activities;
- Emissions from demolition and construction plant e.g. piling rigs, compressors, excavators, concrete mixers and generators; and
- Emissions from vehicles (e.g. lorries, cars and vans) associated with the demolition of the existing buildings and construction of the Entire Development, import of building materials and removal of waste materials, accessing and leaving the Site on the local road network.

11.97. All demolition and construction effects would be localised and temporary in nature.

11.98. The National Air Quality Objectives seek to address the health implications of fine particulate matter, which comes largely from combustion sources such as motor vehicle engines. In the case of particles released from ground excavation works, demolition and construction, the majority of these will tend to be larger particles, which generally settle out close to the works and may cause annoyance due to their soiling capability. In this respect, there are no formal standards or criteria for adverse effects caused by deposited particulate matter.

11.99. Dust from demolition and construction activities within the urban environment generally does not arise at distances beyond approximately 200m from the works (in the absence of mitigation), and the majority of any deposition that might give rise to significant soiling tends to occur within 50 to 100m. Receptors that are downwind of a construction site are at more risk of dust effects than those that are upwind. The occupiers of residential properties tend to be more sensitive to dust than occupiers of commercial properties. In addition, in built up areas, neighbouring buildings will limit the movement of dust by acting as a 'screen'.

11.100. The area surrounding the Site is predominantly occupied by residential and commercial uses. Therefore, there are sensitive properties (e.g. residential) in proximity to the Site. The nearest existing residential properties are located west of the Site on Calthorpe Street adjacent to the boundary (i.e. within 10m). Additionally, there are a number of residential properties located between 20m and 200m from the Site to the north on Margery Street, Calthorpe Street, Lloyd Baker Street, Kings Cross Road and to the south of the Site along Mount Pleasant.

11.101. Given the proximity of the residential properties to the Site, it is likely that without mitigation, there would be the potential for at worst **local, temporary substantial adverse effects** from demolition and construction activities at the closest properties within 10m of the Site, **local, temporary moderate adverse effects** at properties between 10m and 100m from the Site and **local, temporary minor adverse effects** at receptors between 100m and 200m from the Site. As such, specific management controls would be required to reduce the potential for dust effects on these properties.

11.102. In addition, there is the potential for early phases of the Entire Development to be occupied whilst later phases are being constructed. Due to their potential proximity to works (i.e. potential to be within 10m of works), it is likely that without mitigation, there would be the potential for at worst **local, temporary substantial adverse effects** from construction activities at residential locations within early phases of Development Scenario 1 should they be occupied whilst later stages are constructed.

Development Scenario 2

11.103. Given the size of the Calthorpe Street Development (20,000 sq m) and the time over which it is expected to be built (Development Scenario 2 to be constructed over 4 years and 6 months and operational by 2018), it is considered to be a major construction site, as per the criteria in Table 11.2. In addition, the Calthorpe Street site would be classed as a 'High' risk site by the GLA 'Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance'[25] owing to its size (over 15,000 sq m and 150 properties) and it being a Major Development referable to the Mayor.

11.104. The demolition and construction works in relation to Development Scenario 2 have the potential to effect local air quality conditions, as detailed for Development Scenario 1:

11.105. The area surrounding the Calthorpe Street site is predominantly occupied by residential and commercial uses. Therefore, there are sensitive properties (e.g. residential) in proximity to the Calthorpe Street site. The nearest existing residential properties are located west of the Calthorpe Street site on Calthorpe Street adjacent to the boundary (i.e. within 10m). Additionally, there are a number of residential properties located between 20m and 200m from the Calthorpe Street site to the north on Margery Street, Calthorpe Street, Lloyd Baker Street, Kings Cross Road and to the south of the Calthorpe Street site along Mount Pleasant.

11.106. Given the proximity of the residential properties to the Calthorpe Street site, it is likely that without mitigation, there would be the potential for at worst **local, temporary substantial adverse effects** from demolition and construction activities at the closest properties within 10m of the Calthorpe Street site, **local, temporary moderate adverse effects** at properties between 10m and 100m from the Calthorpe Street site and **local, temporary minor adverse effects** at receptors between 100m and 200m from the Calthorpe Street site. As such, specific management controls would be required to reduce the potential for dust effects on these properties.

11.107. In addition, there is the potential for early phases of the Calthorpe Street Development to be occupied whilst later phases are being constructed. Due to their potential proximity to works (i.e. potential to be within 10m of works), it is likely that without mitigation, there would be the potential for at worst **local, temporary substantial adverse effects** from construction activities at residential locations within early phases of Development Scenario 2 should they be occupied whilst later stages are constructed.

Development Scenario 3

11.108. Given the size of the Phoenix Place Development (14,000 sq m) and the time over which it is expected to be built (Development Scenario 3 to be constructed over 3 years and operational by 2018), it is considered to be a minor construction site, as per the criteria in Table 11.2. In addition, the Phoenix Place site would be classed as a 'Medium' risk site by the GLA 'Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance'[25] owing to its size (between 1,000 and 15,000 sq m).

11.109. The demolition and construction works in relation to Development Scenario 3 have the potential to effect local air quality conditions, as detailed for Development Scenario 1.

11.110. The area surrounding the Phoenix Place site is predominantly occupied by residential and commercial uses. Therefore, there are sensitive properties (e.g. residential) in proximity to the Phoenix Place site. The nearest existing residential properties are located north and east of the Phoenix Place site on Calthorpe Street adjacent to the boundary (i.e. within 10m). Additionally, there are a number of residential properties located between 20m and 200m from the Phoenix Place site to the south of the Phoenix Place site along Mount Pleasant.

11.111. Given the proximity of the residential properties to the Phoenix Place site, it is likely that without mitigation, there would be the potential for at worst **local, temporary moderate adverse effects** from demolition and construction activities at the closest properties within 10m of the Phoenix Place site, **local, temporary minor adverse effects** at properties between 10m and 100m from the Phoenix Place site and **local, temporary negligible effects** at receptors between 100m and 200m from the Phoenix Place site. As such, specific management controls would be required to reduce the potential for dust effects on these properties.

11.112. In addition, there is the potential for early phases of the Phoenix Place Development to be occupied whilst later phases are being constructed. Due to their potential proximity to works (i.e. potential to be within 10m of works), it is likely that without mitigation, there would be the potential for at worst **local, substantial adverse effects** from construction activities at residential locations within early phases of Development Scenario 3 should they be occupied whilst later stages are constructed.

Vehicle Emissions

Development Scenario 1

11.113. Operating plant within the Entire Development and construction vehicles entering and leaving the Entire Development would have the potential to contribute to local levels of air pollution, particularly NO_2 and PM_{10} through exhaust emissions.

11.114. It is estimated, in Chapter 9: Transportation and Access, that the average volume of daily construction traffic in relation to Development Scenario 1 would peak at around 23 vehicles/hour (230 daily movements based on a 10 hour working day) during the peak construction period (Quarter 1 2016). Whilst these additional traffic movements are considered insignificant in relation to the volume of existing traffic flows on the surrounding road networks (see Chapter 9: Transportation and Access), it is considered that there would be the potential for a **temporary, local** and **adverse effect** of a **minor** significance on air quality from construction vehicles, in the peak construction period, and a **negligible effect** outside the peak construction period, especially in the context of existing local background pollutant concentrations and local road traffic emissions.

11.115. Any emissions from plant operating on the Entire Development would be small in comparison to the emissions from the road traffic movements on the main roads adjacent to the Site and therefore would to have a **negligible effect** on air quality. The proposed mitigation measures (see below) would further reduce any effect.

Development Scenario 2

11.116. Operating plant within the Calthorpe Street site and construction vehicles entering and leaving the Calthorpe Street site would have the potential to contribute to local levels of air pollution, particularly NO_2 and PM_{10} through exhaust emissions..

11.117. It is estimated, in Chapter 9: Transportation and Access, that the average volume of daily construction traffic in relation to Development Scenario 2 would peak at around 19 vehicles/hour (190 daily movements based on a 10 hour working day) during the peak construction period (Quarter 4 2016). Whilst these additional traffic movements are considered insignificant in relation to the volume of existing traffic flows on the surrounding road networks (see Chapter 9: Transportation and Access), it is considered that there would be the potential for a **temporary, local** and **adverse effect** of a **minor** significance on air quality from construction vehicles, in the peak construction period, and a **negligible effect** outside the peak construction period, especially in the context of existing local background pollutant concentrations and local road traffic emissions.

11.118. Any emissions from plant operating on the Calthorpe Street site would be small in comparison to the emissions from the road traffic movements on the main roads adjacent to the Site and therefore would to have a **negligible effect** on air quality. The proposed mitigation measures (see below) would further reduce any effect.

Development Scenario 3

11.119. Operating plant within the Phoenix Place site and construction vehicles entering and leaving the Phoenix Place site would have the potential to contribute to local levels of air pollution, particularly NO_2 and PM_{10} through exhaust emissions..

11.120. It is estimated, in Chapter 9: Transportation and Access, that the average volume of daily construction traffic in relation to Development Scenario 3 would peak at around 12 vehicles/hour (120 daily movements based on a 10 hour working day) during the peak construction period (Quarter 3 2015). Whilst these additional traffic movements are considered insignificant in relation to the volume of existing traffic flows on the surrounding road networks (see Chapter 9: Transportation and Access), it is considered that there would be the potential for a **temporary, local** and **adverse effect** of a **minor** significance on air quality from construction vehicles, in the peak construction period, and a **negligible effect** outside the peak construction period, especially in the context of existing local background pollutant concentrations and local road traffic emissions.

11.121. Any emissions from plant operating on the Phoenix Place site would be small in comparison to the emissions from the road traffic movements on the main roads adjacent to the Site and therefore would to have a **negligible effect** on air quality. The proposed mitigation measures (see below) would further reduce any effect.

Completed Development Scenarios

11.122. Operational effects on local air quality associated with the completed Development Scenarios would result from changes to traffic flows associated with each Development Scenario and emissions from the operation of the car parks and heating plant within each Development Scenario.

Development Scenario 1

11.123. The results of the ADMS-Roads air quality modelling, which has included operational traffic (based on current guidance, i.e. with reduced emission rates and background concentration to the completion year of 2020), and the proposed heating plant, for the Entire Development are presented in Table 11.11.

11.124. Table 11.11 presents predicted concentrations at the receptors introduced as part of the Entire Development for the lowest residential floors and the 13th floor of Building A and 6th floor of Building G as this represents a worst case assessment of road traffic and heating plant emissions. Modelled concentrations at other floor levels across the Entire Development are presented in Appendix 11.2.

Table 11.11: Results of the ADMS-Roads Modelling at Sensitive Receptors Development Scenario 1

	NO_2 Annual Mean (µg/m^3)	PM_{10} Annual Mean (µg/m^3)	PM_{10} – Number of Days >50µg/m^3	$PM_{2.5}$ Annual Mean (µg/m$_3$)
Receptor 1: 1st Floor Flat, 88-90 Farringdon Road				
2012 Existing	61.14	25.22	13	17.79
2020 Without Development	43.13	22.38	8	15.33
2020 With Development	43.51	22.86	8	15.35
2020 Change	0.38	0.04	-	0.02

	NO_2 Annual Mean ($\mu g/m^3$)	PM_{10} Annual Mean ($\mu g/m^3$)	PM_{10} – Number of Days $>50\mu g/m^3$	$PM_{2.5}$ Annual Mean ($\mu g/m_3$)
Receptor 2: 1st Floor Flat, 106 Farringdon Road				
2012 Existing	66.18	25.58	14	18.07
2020 Without Development	46.89	23.07	8	15.49
2020 With Development	47.36	23.11	8	15.52
2020 Change	0.47	0.04	-	0.02
Receptor 3: Ground Floor Flat, 132a Farringdon Road				
2012 Existing	61.04	25.19	13	17.71
2020 Without Development	43.11	22.79	8	15.26
2020 With Development	42.88	22.75	8	15.28
2020 Change	-0.23	-0.04	-	0.02
Receptor 4: 43 Calthorpe Street				
2012 Existing	55.20	24.11	10	17.02
2020 Without Development	39.25	21.90	6	14.74
2020 With Development	39.20	21.88	6	14.75
2020 Change	-0.05	-0.02	-	0.01
Receptor 5: Flat above Apple Tree Public House				
2012 Existing	52.22	23.86	10	16.93
2020 Without Development	37.78	21.64	6	14.65
2020 With Development	37.93	21.65	6	14.66
2020 Change	0.15	0.01	-	0.01
Receptor 6: Building D North Façade (Lower Ground Floor)				
	36.40	21.45	5	14.49
Receptor 7: Building A Phoenix Place Façade (Lower Ground Floor)				
	37.51	21.59	6	14.61
Receptor 8: Building G Farringdon Road (1st Floor)				
	38.69	21.84	6	14.76
Receptor 9: Building K (Ground Floor)				
	36.48	21.45	5	14.49
Receptor 10: Building J Calthorpe Street Façade (Ground Floor)				
	38.35	21.76	6	14.68
Receptor 11: Building H Farringdon Rd/Calthorpe Rd Façade (Ground Floor)				
	42.42	22.36	7	15.08
Receptor 12: Building A Mount Pleasant Façade (13th Floor)				
	37.78	21.35	5	14.49
Receptor 13: Building G Farringdon Road (6th Floor)				
	37.42	21.43	5	14.61

NO_2

11.125. The results in Table 11.11 indicate that for 2012, annual mean NO_2 concentrations are predicted to exceed the objective at all receptor locations. This is a result of the background concentrations used in the assessment being greater than the objective. The results are also consistent with the results of the Waterman EED monitoring study and the Entire Development being located within the AQMAs declared by LBC and LBI.

11.126. As discussed in Appendix 11.2, the hourly mean objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60µg/m^3. As shown in Table 11.11, the predicted concentrations in 2012 are greater than 60µg/m^3 at three of the existing locations and as such it is possible that the hourly objective is exceeded at these locations.

11.127. In 2020 'without' and 'with' Development Scenario 1 concentrations are predicted to exceed the NO_2 annual mean objective value of 40µg/m^3 at all but two of the receptor locations. It should be noted that the annual mean objective is predicted to be exceeded without Development Scenario 1 operational and Development Scenario 1 does not cause any exceedences of the objective. Table 11.11 illustrates that 'without' and 'with' the Development Scenario, the highest predicted annual mean NO_2 concentration (of 47.36µg/m^3 at Receptor 2) is less than 60µg/m^3 and as such the hourly objective is likely to be met in 2020 at all existing receptors.

11.128. Due to the redistribution of traffic flows, in particular HDV movements and redistribution of the car parking within Development Scenario 1 it is predicted that Development Scenario 1 will cause an increase in pollutant concentrations at some receptors and a decrease in concentrations at others. Table 11.12 summarises the magnitude of change (as outlined in Table 11.5) and the significance of effects (as outlined in Table 11.6) for annual mean NO_2 concentrations as a result of the completed Development Scenario in 2020.

Table 11.12: Summary of Effect Significance for Development Scenario 1

No.	Receptor Location	Magnitude of Change (see Table 11.5 of the Significance Criteria above)	Significance (dependent on magnitude of change and magnitude of concentration see Table 11.6 of the Significance Criteria above)
1	1st Floor Flat, 88-90 Farringdon Road	Imperceptible	Negligible
2	1st Floor Flat, 106 Farringdon Road	Small Increase	Minor Adverse
3	Ground Floor Flat, 132a Farringdon Road	Imperceptible	Negligible
4	43 Calthorpe Street	Imperceptible	Negligible
5	Flat above Apple Tree Public House	Imperceptible	Negligible

11.129. As presented in Table 11.12 in relation to annual mean NO_2, Development Scenario 1 is predicted to result in a **minor adverse effect** at one receptor location (receptor 2) and a **negligible effect** at the remaining receptor locations (receptors 1, 3, 4 and 5).

11.130. Given this, and that 'without' and 'with' the Development Scenario the hourly-mean NO_2 objective is not likely to be exceeded, it is considered that the Development Scenario would have a **negligible effect** on hourly NO_2.

Fine Particles

11.131. As shown in Table 11.11, the annual mean concentrations of PM_{10} are predicted to be well below the annual mean objective of 40µg/m^3 and the daily mean PM_{10} objective of 35 days not exceeding 50µg/m^3 in 2012 and in 2020 both 'with' and 'without' the Entire Development at all the receptor locations.

11.132. Using the magnitude of change descriptors outlined in Table 11.5, the Development Scenario 1 is predicted to result in an 'imperceptible' change (an increase / decrease <0.4µg/m^3 annual mean PM_{10} and <1 day increase / decrease in relation to daily mean PM_{10}) at all the receptor locations. On the basis of the significance of effect criteria outlined in Table 11.6, a **negligible** effect on annual and daily mean PM_{10} is predicted as a result of Development Scenario 1.

11.133. The results in Table 11.11 indicate that the annual mean $PM_{2.5}$ objective of 25µg/m^3 is predicted to be met in all scenarios modelled, 2012 and 2020 both 'with' and 'without' the Development Scenario in place. There are no significance criteria in relation to annual mean $PM_{2.5}$ concentrations (see Significance Criteria above). However, given that the predicted annual mean $PM_{2.5}$ concentrations are well below the objective at all receptors with Development Scenario 1 in place, and the greatest change in concentrations as a result of Development Scenario 1 is 0.02µg/m^3, it is considered that Development Scenario 1 would result in a **negligible** effect at all receptor locations on annual mean $PM_{2.5}$.

Air Quality Conditions within the Development Scenario 1

11.134. It is recognised that along with much of the London, the air quality in the area of the Site is relatively poor. As shown in Table 11.11, predicted NO_2, concentrations for the worst case locations modelled within Development Scenario 1 in 2020 exceed the annual mean NO_2 objective at one of the on-Site receptor locations, these locations represent the residential façade at the junction of Calthorpe Street and Farringdon Road. As shown in Table 11.11, the predicted concentrations in 2020 are less than 60µg/m^3 at all the proposed on-site receptor locations and as such it is unlikely that the hourly NO_2 objective is exceeded.

11.135. The results presented in Table 11.11 are for the lower ground floor levels of Buildings A and D, the ground floor levels of Buildings K and H, the 1st and 6th floor level of Building G and the thirteenth floor level of A (i.e. the lowest level, in each building where residential use is located as well as the closest residential floor to the heating plant emissions). As shown by the results in Table A1.16 to Table A1.20 in Appendix 11.2 there are a small number of exceedences of the annual mean NO_2 objective within Development Scenario 1:

- Calthorpe Street site: Building H along the façade at the junction of Farringdon Road/Calthorpe Street at Ground and 1st Floors.

11.136. PM_{10} and $PM_{2.5}$ concentrations for the worst case locations modelled within Development Scenario 1 in 2020 are well below the respective objectives at all on-Site receptors.

11.137. Given the above it is considered that the effect of introducing residential uses to the Site is of **minor adverse to negligible** significance for annual mean NO_2 concentrations and **negligible** for hourly mean NO_2, and PM_{10} and $PM_{2.5}$.

Sensitivity Analysis

11.138. As outlined above, recent DEFRA analysis of historical monitoring data have shown a trends that NOx and NO_2 concentrations are not declining as expected.

11.139. The results of the sensitivity analysis (i.e. considering the potential effect of Development Scenario 1 against 2012, conditions) are presented in Appendix 11.2 (refer to Table A1.10). The overall predicted concentrations are higher than those presented above for 2020 owing to higher background concentrations and vehicle emission rates in 2012 than 2020. The higher emission rates also lead to higher changes in pollutant concentrations at some receptors.

11.140. Table A1.11 in Appendix 11.2 summarises the significance of the effects on NO_2 for the existing receptors in accordance with the magnitude of change (as outlined in Table 11.5) and the significance of effects (as outlined in Table 11.6) assuming no improvements to NO_x and NO_2. Development Scenario 1 is predicted to result in an 'imperceptible' change (an increase / decrease <0.4µg/m^3 annual mean NO_2) at three receptor locations and a 'small change (an increase / decrease 0.4 – 2µg/m^3 annual mean NO_2). On the basis of the significance of effect criteria outlined in Table 11.6, assuming no improvements in NO_X and NO_2, Development Scenario 1 is predicted to result in a **negligible effect** at three receptor locations (receptors 3, 4 and 5) and a **minor adverse effect** at the remaining two receptor locations (receptors 1 and 2).

11.141. As shown in Table A1.10 in Appendix 11.1, assuming that NO_X and NO_2 concentrations are not declining as expected, predicted annual mean concentrations, 'without' and 'with' the Development Scenario are above 60µg/m^3 at three receptor locations. Given this it is considered that Development Scenario 1 would have a **negligible effect** on hourly NO_2.

11.142. Table A1.20 in Appendix 11.2 summarises the predicted annual mean NO_2 concentrations for the residential receptor locations within Development Scenario 1 itself, and identifies that all annual mean NO_2 concentrations exceed the objective when assuming no improvements in NO_X and NO_2 this is as a result of the background concentrations used in the assessment being greater than 40µg/m^3.

11.143. When assuming no reduction in NOx and NO_2 concentrations, predicted annual mean concentrations are below 60µg/m^3 at all locations within the Development Scenario and as such it is unlikely that the hourly objective is exceeded. The significance of introducing residential uses to the Site in relation to NO_2 is considered to be **moderate adverse** when assuming no reduction in NOx and NO_2 concentrations.

11.144. The predicted exceedances of the annual mean objective for NO_2 within the sensitivity analysis occur in the both 'with' and 'without' the Development Scenarios and not as a result of Development Scenario 1. In addition, the guidance published by DEFRA is that there may be reductions in NO_x and NO_2 concentrations post 2015 when the Euro 6 emission standards begin to take effect. It is therefore considered that concentrations could conceivably be lower than those presented in this sensitivity analysis.

Development Scenario 2

11.145. The results of the ADMS-Roads air quality modelling, which has included operational traffic (based on current guidance, i.e. with reduced emission rates and background concentration to the completion year of 2018), and the proposed heating plant, for Development Scenario 2 the Calthorpe Street Development are presented in Table 11.13.

11.146. Table 11.13 presents predicted concentrations at the receptors introduced as part of the Development Scenario for the lowest residential floors and the 6th floor of Building G as this represents a worst case assessment of road traffic and heating plant emissions. Modelled concentrations at other floor levels across the Development Scenario are presented in Appendix 11.2.

Table 11.13: Results of the ADMS-Roads Modelling at Sensitive Receptors for Development Scenario 2

	NO_2 Annual Mean ($\mu g/m^3$)	PM_{10} Annual Mean ($\mu g/m^3$)	PM_{10} – Number of Days >50$\mu g/m^3$	$PM_{2.5}$ Annual Mean ($\mu g/m_3$)
Receptor 1: 1st Floor Flat, 88-90 Farringdon Road				
2012 Existing	61.14	25.22	13	17.79
2018 Without Development	48.17	23.29	9	15.80
2018 With Development	48.43	23.32	9	15.83
2018 Change	0.26	0.03	-	0.02
Receptor 2: 1st Floor Flat, 106 Farringdon Road				
2012 Existing	66.18	25.58	14	18.07
2018 Without Development	52.49	23.56	9	15.99
2018 With Development	52.81	23.59	9	16.01
2018 Change	0.32	0.03	-	0.03
Receptor 3: Ground Floor Flat, 132a Farringdon Road				
2012 Existing	61.04	25.19	13	17.71
2018 Without Development	48.06	23.25	9	15.73
2018 With Development	47.54	23.20	8	15.75
2018 Change	-0.52	-0.05	-1	0.02
Receptor 4: 43 Calthorpe Street				
2012 Existing	55.20	24.11	10	17.02
2018 Without Development	43.70	22.32	7	15.18
2018 With Development	43.56	22.30	7	15.19
2018 Change	-0.14	-0.02	-	0.01
Receptor 5: Flat above Apple Tree Public House				
2012 Existing	52.22	23.86	10	16.93
2018 Without Development	41.70	22.07	6	15.08
2018 With Development	41.69	22.06	6	15.08
2018 Change	-0.01	-0.02	-	-
Receptor 8: Building G Farringdon Road				
	42.45	22.25	7	15.20
Receptor 9: Building K				
	40.15	21.84	6	14.91
Receptor 10: Building J Calthorpe Street Façade				
	42.53	22.17	7	15.11
Receptor 11: Building H Farringdon Rd/Calthorpe Rd Façade				
	47.06	22.81	8	15.54
Receptor 13: Building G Farringdon Road				
	40.78	21.83	6	14.93

NO_2

11.147. The results in Table 11.13 indicate that for 2012, annual mean NO_2 concentrations are predicted to exceed the objective at all receptor locations. This is as a result of the background concentrations used in the assessment being greater than the objective. The results are also consistent with the results of the Waterman EED monitoring study and the Calthorpe Street site being located within the AQMA declared LBI.

11.148. As discussed in Appendix 11.2, the hourly mean objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60µg/m^3. As shown in Table 11.13, the predicted concentrations in 2012 are greater than 60µg/m^3 at three of the existing locations and as such it is possible that the hourly objective is exceeded at these locations.

11.149. In 2018 'without' and 'with' Development Scenario 2 concentrations are predicted to exceed the NO_2 annual mean objective value of 40µg/m^3 at all of the receptor locations. It should be noted that the annual mean objective is predicted to be exceeded without Development Scenario 2 operational and Development Scenario 2 does not cause any exceedences of the objective. Table 11.13 illustrates that 'without' and 'with' Development Scenario 2, the highest predicted annual mean NO_2 concentration (of 52.81µg/m^3 at Receptor 2) is less than 60µg/m^3 and as such the hourly objective is likely to be met in 2018 at all existing receptors.

11.150. Due to the redistribution of traffic flows, in particular HDV movements, and redistribution of the car parking within Development Scenario 2 it is predicted that Development Scenario 2 will causes an increase in pollutant concentrations at some receptors and a decrease in concentrations at others. Table 11.14 summarises the magnitude of change (as outlined in Table 11.5) and the significance of effects (as outlined in Table 11.6) for annual mean NO_2 concentrations as a result of the completed Development Scenario 2 in 2018.

Table 11.14: Summary of Effect Significance for Development Scenario 2

No.	Receptor Location	Magnitude of Change (see Table 11.5 of the Significance Criteria above)	Significance (dependent on magnitude of change and magnitude of concentration see Table 11.6 of the Significance Criteria above)
1	1st Floor Flat, 88-90 Farringdon Road	Imperceptible	Negligible
2	1st Floor Flat, 106 Farringdon Road	Imperceptible	Negligible
3	Ground Floor Flat, 132a Farringdon Road	Small Decrease	Minor Beneficial
4	43 Calthorpe Street	Imperceptible	Negligible
5	Flat above Apple Tree Public House	Imperceptible	Negligible

11.151. As presented in Table 11.14 in relation to annual mean NO_2, Development Scenario 2 is predicted to result in a **negligible effect** at four receptor locations and a **minor beneficial effect** at the remaining receptor location (receptor 3).

11.152. Given this, and that 'without' and 'with' the Development Scenario the hourly-mean NO_2 objective is not likely to be exceeded, it is considered that the Development Scenario would have a **negligible effect** on hourly NO_2.

Fine Particulates

11.153. As shown in Table 11.13, the annual mean concentrations of PM_{10} are predicted to be well below the objective value of 40µg/m^3 in 2012 and in 2018 both 'with' and 'without' Development Scenario 2 at all the receptor locations.

11.154. Using the magnitude of change descriptors outlined in Table 11.5, the Development Scenario 2 is predicted to result in an 'imperceptible' change (an increase / decrease <0.4µg/m^3 annual mean PM_{10}) at all the receptor locations and an 'imperceptible' change (<1 day increase / decrease in relation to daily mean PM_{10}) at four receptor locations and a 'small' change (1-2 day increase / decrease in relation to daily mean PM_{10}) at the remaining receptor location. On the basis of the significance of effect criteria outlined in Table 11.6, a **negligible effect** on annual and daily mean PM_{10} is predicted as a result of Development Scenario 2.

11.155. The results in Table 11.13 indicate that the annual mean $PM_{2.5}$ objective of 25µg/m^3 is predicted to be met in all scenarios modelled, 2012 and 2018 both 'with' and 'without' the Development Scenario in place. There are no significance criteria in relation to annual mean $PM_{2.5}$ concentrations (see Significance Criteria above). However, given that the predicted annual mean $PM_{2.5}$ concentrations are well below the objective at all receptors with the Development Scenario in place, and the greatest change in concentrations as a result of Development Scenario 2 is 0.03µg/m^3, it is considered that Development Scenario 2 would result in a a **negligible effect** at all receptor locations on annual mean $PM_{2.5}$.

Air Quality Conditions within the Development Scenario 2

11.156. It is recognised that along with much of the London, the air quality in the area of the Site is relatively poor. As shown in Table 11.13, predicted NO_2, concentrations for the worst case locations modelled within Development Scenario 2 in 2018 exceed the annual mean NO_2 objective at three of the on-site receptor locations, these locations represent the residential façades that front onto either Calthorpe Road and Farringdon Road. As shown in Table 11.13, the predicted concentrations in 2018 are less than 60µg/m^3 at all the proposed on-site receptor locations and as such it is unlikely that the hourly NO_2 objective is exceeded.

11.157. The results presented in Table 11.13 are for the ground floor levels of Building K and H, the 1st and 6th floor level of Building G (i.e. the lowest level, in each building where residential use is located as well as the closest residential floor to the heating plant emissions). As shown by the results in Table A1.21 to Table A1.25 in Appendix 11.2 there are a small number of exceedences of the annual mean NO_2 objective within the Development Scenario:

- Calthorpe Street site: Building F 1st – 8th Floor;
- Calthorpe Street site: Building J along the Phoenix Place Façade and along the Calthorpe Street Façade at Ground, 1st, 2nd and 3rd Floors
- Calthorpe Street site: Building H along the Farringdon Road/Calthorpe Street Façades Ground, 1st, 2nd, 3rd, 4th, 5th and 6th Floors;

11.158. PM_{10} and $PM_{2.5}$ concentrations for the worst case locations modelled within Development Scenario 2 in 2018 are well below the respective objectives at all on-Site receptors.

11.159. Given the above it is considered that the effect of introducing residential uses to the Site is of **minor adverse to negligible** significance for annual mean NO_2 concentrations and **negligible** for hourly mean NO_2, and PM_{10} and $PM_{2.5}$.

Sensitivity Analysis

11.160. As outlined above, recent DEFRA analysis of historical monitoring data have shown a trends that NOx and NO_2 concentrations are not declining as expected.

11.161. The results of the sensitivity analysis (i.e. considering the potential effect of Development Scenario 2 against the current baseline, 2012, conditions) are presented in Appendix 11.2 (refer to Table A1.12). The overall predicted concentrations are higher than those presented above for 2018 owing to higher background concentrations and vehicle emission rates in 2012 than 2018. The higher emission rates also lead to higher changes in pollutant concentrations at some receptors.

11.162. Table A1.13 in Appendix 11.2 summarises the significance of the effects on NO_2 for the existing receptors in accordance with the magnitude of change (as outlined in Table 11.5) and the significance of effects (as outlined in Table 11.6) assuming no improvements to NO_x and NO_2. Development Scenario 2 is predicted to result in an 'imperceptible' change (an increase / decrease <0.4µg/m^3 annual mean NO_2) at three receptor locations and a 'small change (an increase / decrease 0.4 – 2µg/m^3 annual mean NO_2) at the remaining two receptor locations. On the basis of the significance of effect criteria outlined in Table 11.6, assuming no improvements in NO_X and NO_2, Development Scenario 1 is predicted to result in a **negligible** effect at three receptor locations and a **minor adverse** effect at the remaining two receptor locations.

11.163. As shown in Table A1.12 in Appendix 11.2, assuming that NO_X and NO_2 concentrations are not declining as expected, predicted annual mean concentrations, 'without' and 'with' the Development Scenario 2 are below 60µg/m^3 at three receptor locations. It is therefore considered that Development Scenario 2 would have a **negligible** effect on hourly NO_2.

11.164. Table A1.25 in Appendix 11.2 summarises the predicted annual mean NO_2 concentrations for the residential receptor locations within Development Scenario 2 itself, and identifies that all annual mean NO_2 concentrations exceed the objective when assuming no improvements in NO_X and NO_2 this is as a result of the background concentrations used in the assessment being greater than 40µg/m^3.

11.165. As discussed in Appendix 11.2, the hourly mean objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60µg/m^3. When assuming no reduction in NOx and NO_2 concentrations, predicted annual mean concentrations are below 60µg/m^3 at all receptor locations within Development Scenario 2 and as such it is unlikely that the hourly objective is exceeded. The overall significance of introducing residential uses to the Calthorpe Street site in relation to NO_2 is considered to be **moderate adverse** when assuming no reduction in NOx and NO_2 concentrations.

11.166. As outlined above, the guidance published by DEFRA is that there may be reductions in NO_x and NO_2 concentrations post 2015 when the Euro 6 emission standards begin to take effect. It is therefore considered that concentrations could conceivably be lower than those presented in this sensitivity analysis.

Development Scenario 3

11.167. The results of the ADMS-Roads air quality modelling, which has included operational traffic (based on current guidance, i.e. with reduced emission rates and background concentration to the completion year of 2018), and the proposed heating plant, for Development Scenario 3 the Phoenix Place Development are presented in Table 11.15.

11.168. Table 11.15 presents predicted concentrations at the receptors introduced as part of Development Scenario 3 for the lowest residential floors and the 13th floor of Block A3 as this represents a worst case assessment of road traffic and heating plant emissions. Modelled concentrations at other floor levels across Development Scenario 3 are presented in Appendix 11.2.

Table 11.15: Results of the ADMS-Roads Modelling at Sensitive Receptors for Development Scenario 3

	NO_2 Annual Mean ($\mu g/m^3$)	PM_{10} Annual Mean ($\mu g/m^3$)	PM_{10} – Number of Days >50$\mu g/m^3$	$PM_{2.5}$ Annual Mean ($\mu g/m_3$)
Receptor 1: 1st Floor Flat, 88-90 Farringdon Road				
2012 Existing	61.14	25.22	13	17.79
2018 Without Development	48.17	23.29	9	15.80
2018 With Development	48.19	23.29	9	15.80
2018 Change	0.02	-0.01	-	-
Receptor 2: 1st Floor Flat, 106 Farringdon Road				
2012 Existing	66.18	25.58	14	18.07
2018 Without Development	52.49	23.56	9	15.99
2018 With Development	52.47	23.55	9	15.99
2018 Change	-0.02	-0.01	-	-
Receptor 3: Ground Floor Flat, 132a Farringdon Road				
2012 Existing	61.04	25.19	13	17.71
2018 Without Development	48.06	23.25	9	15.73
2018 With Development	47.33	23.17	8	15.73
2018 Change	-0.73	-0.09	-1	-
Receptor 4: 43 Calthorpe Street				
2012 Existing	55.20	24.11	10	17.02
2018 Without Development	43.70	22.32	7	15.18
2018 With Development	43.35	22.29	7	15.18
2018 Change	-0.35	-0.04	-	-
Receptor 5: Flat above Apple Tree Public House				
2012 Existing	52.22	23.86	10	16.93
2018 Without Development	41.70	22.07	6	15.08
2018 With Development	41.65	22.06	6	15.09
2018 Change	-0.05	-0.01	-	-
Receptor 6: Building D North Façade				
	40.04	21.85	6	14.91
Receptor 7: Building A Phoenix Place Façade				
	41.08	22.01	6	15.05
Receptor 12: Building A Mount Pleasant Façade (13th Floor)				
	41.26	21.76	6	14.91

NO_2

11.169. The results in Table 11.15 indicate that for 2012, annual mean NO_2 concentrations are predicted to exceed the objective at all receptor locations. This is a result of the background concentrations used in the assessment being greater than the objective. The results are also consistent with the results of the Waterman monitoring study and the Phoenix Place site being located within the AQMA declared by LBC.

11.170. As discussed in Appendix 11.2, the hourly mean objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60µg/m^3. As shown in Table 11.15, the predicted concentrations in 2012 are greater than 60µg/m^3 at three of the existing locations and as such it is possible that the hourly objective is exceeded at these locations.

11.171. In 2018 'without' and 'with' Development Scenario 3 concentrations are predicted to exceed the NO_2 annual mean objective value of 40µg/m^3 at all of the receptor locations. It should be noted that the annual mean objective is predicted to be exceeded without Development Scenario 3 operational and Development Scenario 3 does not cause any exceedences of the objective, Table 11.15 illustrates that 'without' and 'with' Development Scenario 3, the highest predicted annual mean NO_2 concentration (of 52.49µg/m^3 at Receptor 2) is less than 60µg/m^3 and as such the hourly objective is likely to be met in 2018 at all existing receptors.

11.172. Due to the redistribution of traffic flows, in particular HDV movements and redistribution of the car parking within Development Scenario 3 it is predicted that Development Scenario 3 will causes an increase in pollutant concentrations at some receptors and a decrease in concentrations at others. Table 11.16 summarises the magnitude of change (as outlined in Table 11.5) and the significance of effects (as outlined in Table 11.6) for annual mean NO_2 concentrations as a result of the completed Development in 2018.

Table 11.16: Summary of Effect Significance for Development Scenario 3

No.	Receptor Location	Magnitude of Change (see Table 11.5 of the Significance Criteria above)	Significance (dependent on magnitude of change and magnitude of concentration see Table 11.6 of the Significance Criteria above)
1	1st Floor Flat, 88-90 Farringdon Road	Imperceptible	Negligible
2	1st Floor Flat, 106 Farringdon Road	Imperceptible	Negligible
3	Ground Floor Flat, 132a Farringdon Road	Small Decrease	Minor Beneficial
4	43 Calthorpe Street	Imperceptible	Negligible
5	Flat above Apple Tree Public House	Imperceptible	Negligible

11.173. As presented in Table 11.16 in relation to annual mean NO_2, Development Scenario 3 is predicted to result in a **negligible** effect at four receptor locations and a **minor beneficial** result at the remaining receptor location (receptor 3).

11.174. Given this, and that 'without' and 'with' Development Scenario 3 the hourly-mean NO_2 objective is not likely to be exceeded, it is considered that the Development Scenario would have a **negligible effect** on hourly NO_2.

Fine Particulates

11.175. As shown in Table 11.15, the annual mean concentrations of PM_{10} are predicted to be well below the objective value of 40µg/m^3 in 2012 and in 2018 both 'with' and 'without' the Development Scenario 3 at all the receptor locations.

11.176. Using the magnitude of change descriptors outlined in Table 11.5, the Development Scenario 3 is predicted to result in an 'imperceptible' change (an increase / decrease <0.4µg/m^3 annual mean PM_{10}) at all the receptor locations and an 'imperceptible' change (<1 day increase / decrease in relation to daily mean PM_{10}) at four receptor locations and a 'small' change (1-2 day increase / decrease in relation to daily mean PM_{10}) at the remaining receptor location. On the basis of the significance of effect criteria outlined in Table 11.6 and Table 11.7, a **negligible effect** on annual and daily mean PM_{10} is predicted as a result of the Development Scenario 3.

11.177. The results in Table 11.15 indicate that the annual mean $PM_{2.5}$ objective of 25µg/m^3 is predicted to be met in all scenarios modelled, 2012 and 2018 both 'with' and 'without' the Development Scenario in place. There are no significance criteria in relation to annual mean $PM_{2.5}$ concentrations (see Significance Criteria above). However, given that the predicted annual mean $PM_{2.5}$ concentrations are well below the objective at all receptors with the Phoenix Place Development Scenario in place, and the greatest increase in concentrations is <0.01µg/m^3 as a result of the Development Scenario, it is considered that Development Scenario 3 would result in a **negligible effect** on annual mean $PM_{2.5}$ at all receptor locations.

Air Quality Conditions within the Development Scenario 3

11.178. It is recognised that along with much of the London, the air quality in the area of the Site is relatively poor. As shown in Table 11.15, predicted NO_2, concentrations for the worst case locations modelled within Development Scenario 3 in 2018 exceed the annual mean NO_2 objective at all three of the on-site receptor locations. As shown in Table 11.15, the predicted concentrations in 2018 are less than 60µg/m^3 at all the proposed on-Site receptor locations and as such it is unlikely that the hourly NO_2 objective is exceeded.

11.179. The results presented in Table 11.15 are for the lower ground floor levels of Buildings A and D and the thirteenth floor level of Building D (i.e. the lowest level, in each building where residential use is located as well as the closest residential floor to the heating plant emissions). As shown by the results in Table A1.26 to Table A1.30 in Appendix 11.2 2 there are a small number of exceedences of the annual mean NO_2 objective within the Development Scenario:

- Pheonix Place site: Building A along Mount Pleasant Façade 1st, 2nd and 13th Floors, along the Phoenix Place Façade Lower Ground, Upper Ground, 1st, 2nd, 3rd and 4th Floors;
- Pheonix Place site: Building C along the Phoenix Place Façade Upper Ground Floor
- Pheonix Place site: Building D Lower and Upper Ground Floors;

11.180. PM_{10} and $PM_{2.5}$ concentrations for the worst case locations modelled within Development Scenario 3 in 2018 are well below the respective objectives at all on-Site receptors.

11.181. Given the above it is considered that the effect of introducing residential uses to the Site is of **minor adverse** significance for annual mean NO_2 concentrations and **negligible** for hourly mean NO_2, and PM_{10} and $PM_{2.5}$.

Sensitivity Analysis

11.182. As outlined above, recent DEFRA analysis of historical monitoring data have shown a trend that NOx and NO_2 concentrations are not declining as expected.

11.183. The results of the sensitivity analysis (i.e. considering the potential effect of Development Scenario 3 against the current baseline, 2012, conditions) are presented in Appendix 11.2 (refer to Table A1.14). The overall predicted concentrations are higher than those presented above for 2018 owing to higher background concentrations and vehicle emission rates in 2012 than 2018. The higher emission rates also lead to higher changes in pollutant concentrations at some receptors.

11.184. Table A1.15 in Appendix 11.2 summarises the significance of the effects on NO_2 for the existing receptors in accordance with the magnitude of change (as outlined in Table 11.5) and the significance of effects (as outlined in Table 11.6) assuming no improvements to NO_x and NO_2. Development Scenario 3 is predicted to result in an 'imperceptible' change (an increase / decrease <0.4µg/m^3 annual mean NO_2) at three receptor locations and a 'small change (an increase / decrease 0.4 – 2µg/m^3 annual mean NO_2) at the remaining two receptor locations. On the basis of the significance of effect criteria outlined in Table 11.6, assuming no improvements in NO_X and NO_2, Development Scenario 3 is predicted to result in a **negligible** effect at three receptor locations and a **minor beneficial** effect at the remaining two receptor locations.

11.185. As shown in Table A1.14 in Appendix 11.2, assuming that NO_X and NO_2 concentrations are not declining as expected, predicted annual mean concentrations, 'without' and 'with' the Development Scenario are above 60µg/m^3 at three receptor locations. It is therefore considered that Development Scenario 1 would have a **negligible** effect on hourly NO_2.

11.186. Table A1.30 in Appendix 11.2 summarises the predicted annual mean NO_2 concentrations for the residential receptor locations within Development Scenario 3 itself, and identifies that all annual mean NO_2 concentrations exceed the objective when assuming no improvements in NOx and NO_2 this is as a result of the background concentrations used in the assessment being greater than 40µg/m^3.

11.187. As discussed in Appendix 11.2, the hourly mean objective for NO_2 is unlikely to be exceeded at a roadside location where the annual-mean NO_2 concentration is less than 60µg/m^3. When assuming no reduction in NOx and NO_2 concentrations, predicted annual mean concentrations are below 60µg/m^3 at all receptor locations within Development Scenario 3 and as such it is unlikely that the hourly objective is exceeded. The overall significance of introducing residential uses to the Phoenix Place site in relation to NO_2 is considered to be **moderate adverse** when assuming no reduction in NOx and NO_2 concentrations.

11.188. As outlined above, the guidance published by DEFRA is that there may be reductions in NO_x and NO_2 concentrations post 2015 when the Euro 6 emission standards begin to take effect. It is therefore considered that concentrations could conceivably be lower than those presented in this sensitivity analysis.

Mitigation Measures

Demolition and Construction

Nuisance Dust

11.189. A range of environmental management controls would be developed with reference to the BRE guidance 'Controlling Particles, Vapour and Noise from Construction Sites'[26] and the LBI and LBC Codes of Construction which would apply for all three Development Scenarios (and the GLA 'Control of Dust and Emissions from Construction and Demolition, Best Practice Guidance'[25], relating to 'High' risk sites for Development Scenarios 1 and 2 and 'Medium' risk sites for Development Scenario 3). Such measures would prevent the release of dust entering the atmosphere and/or being deposited on nearby receptors and could include:

- Routine dust monitoring at sensitive residential locations with the results and effectiveness of controls reviewed at regular meetings;
- Damping down surfaces during dry weather;
- Erection of appropriate hoarding and/or fencing to reduce dust dispersion and restrict public access;
- Sheeting of buildings, chutes, skips and vehicles removing demolition wastes;
- Building elevations which front public boundaries or are immediately adjacent to adjoining properties would be fully scaffolded and completely enclosed by sheeting to provide a dust and safety shield during the demolition process;
- Appropriate handling and storage of materials, especially stockpiled materials;
- Restriction of drop heights onto lorries and other equipment;
- Use of 'deconstruction' demolition techniques, where appropriate;
- Use of a wheel wash, limiting of vehicle speeds to 5 mph, avoidance of unnecessary idling of engines and routing of Site traffic as far from residential and commercial properties as possible;
- Fitting all equipment (e.g. for cutting, grinding, crushing) with dust control measures such as water sprays wherever possible;
- Use of gas powered generators rather than diesel if possible (these are also quieter) and ensuring that all plant and vehicles are well maintained so that exhaust emissions do not breach statutory emission limits;
- Switching off of all plant when not in use;
- No fires would be allowed on the Site; and
- Ensuring that a road sweeper is available to clean mud and other debris from hardstanding roads and footpaths.

11.190. Particular attention would be paid to operations which would inevitably have to take place close to the most sensitive surrounding properties (due to their proximity and orientation in relation to the Site) at the boundary of the Site.

11.191. Measures to control dust are routinely and successfully applied to construction projects throughout the UK, and are proven to reduce significantly the potential for adverse nuisance dust effects associated with the various stages of construction work.

Vehicle Emissions

11.192. Detailed mitigation measures to control construction traffic in relation to all three Development Scenarios would be discussed and agreed with LBC and LBI to establish the most suitable access and haul routes for Site traffic. The most effective mitigation would be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible. The timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

Completed Development Scenarios

Development Scenario 1

11.193. Development Scenario 1 is predicted to have a minor beneficial to negligible effect on local air quality and therefore mitigation measures would not be required in relation to operation effects. However, a Travel Plan would be produced to encourage car sharing and reduce the number of car trips associated with Development Scenario 1, and encourage walking and cycling and use of public transport, which would also reduce emissions to air.

11.194. A number of residential facades within Development Scenario 1 are predicted to experience exceedences of the annual mean NO_2 concentrations. A Whole House Mechanical Ventilation System is to be provided to all residential units within the Development Scenario. Where the intakes for these are located within the areas of exceedence as predicted in the non-sensitivity assessment above then they will be fitted with filters for NOx to reduce the exposure of future residential occupants.

Development Scenario 2

11.195. The mitigation measures for Development Scenario 2 would be the same as those set out in Development Scenario 1.

Development Scenario 3

11.196. The mitigation measures for Development Scenario 3 would be the same as those set out in Development Scenario 1.

Residual Effects

Demolition and Construction

Nuisance Dust

Development Scenario 1

11.197. Following the employment of appropriate environmental management controls which are routinely and successfully applied throughout the UK, **negligible** to **moderate adverse** residual effects would likely arise from construction-related dust emissions from Development Scenario 1.

Development Scenario 2

11.198. Following the employment of appropriate environmental management controls which are routinely and successfully applied throughout the UK, **negligible** to **moderate adverse** residual effects would likely arise from construction-related dust emissions from Development Scenario 2.

Development Scenario 3

11.199. Following the employment of appropriate environmental management controls which are routinely and successfully applied throughout the UK, **negligible** to **minor adverse** residual effects would likely arise from construction-related dust emissions from Development Scenario 3.

Vehicle Emissions

Development Scenario 1

11.200. It is anticipated that the effect of construction vehicles entering and leaving the Site would be at worst **minor adverse**, during peak construction periods, and **negligible** at all other times, in the context of local background pollutant concentrations and existing local road traffic emissions.

11.201. The likely residual effects of exhaust emissions from plant operating on the Site would be **negligible** in the context of existing adjacent road traffic exhaust emissions.

Development Scenario 2

11.202. The residual effects for Development Scenario 2 would be the same as those set out above for Development Scenario 1.

Development Scenario 3

11.203. The residual effects for Development Scenario 3 would be the same as those set out above for Development Scenario 1.

Completed Development

Development Scenario 1

11.204. The effect of operational traffic and heating plant associated with Development Scenario 1 at existing receptors, taking into account uncertainty in future NO_x and NO_2 reductions, are predicted to result in a **minor adverse** to **negligible** effect on local concentrations of NO_2, and a **negligible** effect on local concentrations of PM_{10} and $PM_{2.5}$.

11.205. The effect of introducing new residential units in to the Site, taking into account uncertainty in future NO_x and NO_2 reductions, and the mitigation measures outline above, is considered to be of **minor adverse** to **negligible** significance.

Development Scenario 2

11.206. The effect of operational traffic and heating plant associated with Development Scenario 2 at existing receptors, taking into account uncertainty in future NO_x and NO_2 reductions, are predicted to result in a **minor adverse** to **negligible** effect on local concentrations of NO_2, and a **negligible** effect on local concentrations of PM_{10} and $PM_{2.5}$.

11.207. The effect of introducing new residential units in to the Site, taking into account uncertainty in future NO_x and NO_2 reductions, and the mitigation measures outline above, is considered to be of **minor adverse** to **negligible** significance.

Development Scenario 3

11.208. The effect of operational traffic and heating plant associated with Development Scenario 3 at existing receptors, taking into account uncertainty in future NO_x and NO_2 reductions, are predicted to result in a **minor beneficial** to **negligible** effect on local concentrations of NO_2, and a **negligible** effect on local concentrations of PM_{10} and $PM_{2.5}$.

11.209. The effect of introducing new residential units in to the Site, taking into account uncertainty in future NO_x and NO_2 reductions, and the mitigation measures outline above, is considered to be of **minor adverse** to **negligible** significance.

Conclusion

11.210. A summary of potential effects, mitigation measures and resulting residual effects in relation to local air quality are summarised below within Table 11.16.

Table 11.16: Summary of Potential and Residual Effects

Issue	Potential Effect	Mitigation Measures	Residual Effect
Demolition and Construction			
Development Scenario 1			
Dust emissions from construction activities.	**Local, Temporary Substantial to minor adverse**	Routine environmental management control measures to prevent and control dust.	**Local, Temporary Moderate adverse to negligible**
Emissions from on-site plant.	Negligible	None required.	Negligible
Emissions from construction vehicles.	**Local, Temporary Minor adverse to negligible**	Routine environmental management control measures.	**Local, Temporary Minor adverse to negligible**
Development Scenario 2			
Dust emissions from construction activities.	**Local, Temporary Substantial to minor adverse**	Routine environmental management control measures to prevent and control dust.	**Local, Temporary Moderate adverse to negligible**
Emissions from on-site plant.	**Negligible**	None required.	**Negligible**
Emissions from construction vehicles.	**Local, Temporary Minor adverse to negligible**	Routine environmental management control measures.	**Local, Temporary Minor adverse to negligible**
Development Scenario 3			
Dust emissions from construction activities.	**Local, Temporary Moderate adverse to negligible**	Routine environmental management control measures to prevent and control dust.	**Local, Temporary Minor adverse to negligible**
Emissions from on-site plant.	**Negligible**	None required.	**Negligible**
Emissions from construction vehicles.	**Local, Temporary Minor adverse to negligible**	Routine environmental management control measures.	**Local, Temporary Minor adverse to negligible**
Completed Development			
Development Scenario 1			
Emissions from traffic and heating plant associated with the Development Scenario 1.	**NO_2: Minor adverse to negligible PM_{10} and $PM_{2.5}$: Negligible**	Implementation of Travel Plan	**NO_2: Minor adverse to negligible PM_{10} and $PM_{2.5}$: Negligible**
New sensitive receptors introduced to the Site.	**Moderate adverse**	Mechanical ventilation with filters	**Minor adverse** to **negligible**
Development Scenario 2			
Emissions from traffic and heating plant associated with the Development Scenario 2.	**NO_2: Minor adverse to negligible PM_{10} and $PM_{2.5}$: Negligible**	Implementation of Travel Plan	**NO_2: Minor adverse to negligible PM_{10} and $PM_{2.5}$: Negligible**
New sensitive receptors introduced to the Site.	**Moderate adverse**	Mechanical ventilation with filters	**Minor adverse** to **negligible**
Development Scenario 3			
Emissions from traffic and heating plant associated with the Development Scenario 3.	**NO_2: Minor Beneficial to negligible $PM_{2.5}$ and PM_{10}: Negligible**	Implementation of Travel Plan	**NO_2: Minor Beneficial to negligible $PM_{2.5}$ and PM_{10}: Negligible**
New sensitive receptors introduced to the Site.	**Moderate adverse**	Mechanical ventilation with filters	**Minor adverse** to **negligible**

References

1 Council Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe.
2 DEFRA, 2010 The Air Quality Standards (England) Regulations.
3 Office of the Deputy Prime Minister (ODPM), The Environment Act 1995
4 HMSO, London. Department of the Environment (DoE), 1997, 'The UK National Air Quality Strategy'. HMSO
5 Department of the Environment, Transport and the Regions, 2000, 'UK Air Quality Strategy for England, Scotland, Wales and Northern Ireland'. HMSO, London
6 Department for the Environment, Food and Rural Affairs (DEFRA), Scottish Executive, Welsh Assembly Government and the Department of the Environment in Northern Ireland, 2003, 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland: (Addendum)'. DEFRA, London.
7 Department of the Environment, Food and Rural Affairs (DEFRA), 2007. The Air Quality Strategy for England, Scotland, Wales & Northern Ireland
8 Bate, K. J. and Coppin, N. J. (1991) "Dust impacts from mineral workings", Mine and Quarry, 20 (3), 1991, pp31 – 35.
9 Department for Communities and Local Government (2012) 'National Planning Policy Framework.'
10 Environmental Protection UK, 2010, 'Development Control: Planning for Air Quality (2010) Update'
11 Mayor of London (July 2011) *The London Plan: Spatial Development Strategy for Greater London*
12 Mayor of London. 2012. Early Minor Alterations to The London Plan
13 London Borough of Islington (2012) Development Management Policies Submission, 2012
14 London Borough of Islington (2012) Site Allocations Submission June 2012
15 London Borough of Islington (2012) Finsbury Local Plan Submission 2012
16 London Borough of Islington (2011) Islington's Core Strategy February 2011
17 London Borough of Islington (2002) Unitary Development Plan, June 2002
18 London Borough of Camden (2012) Camden Site Allocations Proposed Submission Document, March 2012
19 London Borough of Camden (2010). Camden Local Development Framework Camden Core Strategy 2012-2025 Adopted Version 2010.
20 London Borough Camden (2010). Camden Development Policies 2010-2025 Local Development Framework November 2010
21 London Borough of Camden and London Borough of Islington (2012) Mount Pleasant Supplementary Planning Document February 2012
22 Greater London Authority (GLA), 'The Mayor's Air Quality Strategy: Cleaning London's Air', London, 2002.
23 The Mayor's Air Quality Strategy (2010): 'Clearing the Air'.
24 Mayor of London, 2006, 'The Mayor's Draft Supplementary Planning Guidance – Sustainable Design and Construction'.
25 Mayor of London Best Practice Guidance – The Control of Dust and Emissions from Construction Sites, 2006
26 Building Research Establishment (BRE) 2003, Controlling particles, vapour and noise from pollution from construction sites
27 Defra. 2010, Low Emissions Strategies using the planning system to reduce transport emissions, good practice guidance.
28 London Borough of Islington (2003). Air Quality Action Plan August 2003.
29 London Borough of Islington Code of Practice for Construction Sites
30 London Borough of Camden. 2009. Air Quality Action Plan Report 2009-2012.
31 London Borough of Camden. 2008. Guide for Contractors Working in Camden
32 Cambridge Environmental Research Consultants Ltd, ADMS-Roads (22 November 2012) Version 3.1.4
33 Communities and Local Government, 2012, 'Technical Guidance to the National Planning Policy Framework March 2012.
34 http://laqm.defra.gov.uk/faqs/faqs.html
35 DEFRA, 2012. Local Air Quality Management. Note on Projecting NO2 Concentrations, April 2012.
36 London Borough of Islington, 2003. Further Assessment of Air Quality in Islington.
37 London Borough of Islington, 2006. Updating and Screening Assessment 2006.
38 London Borough of Islington, 2009. Updating and Screening Assessment 2009
39 London Borough of Islington, 2011, Air Quality Progress Report 2011.
40 London Borough of Camden. 1998. Statutory Review and Assessment of Air Quality in the London Borough of Camden Stages 1 and 2. June 1998.
41 London Borough of Camden. 2003. Second Round of Review and Assessment of Air Quality: Updating and Screening Assessment August 2003.
42 London Borough of Camden. 2006. Third Round of Review and Assessment of Air Quality: Updating and Screening Assessment. August 2006.

43 London Borough of Camden. 2009. 2009 Air Quality Updating and Screening Assessment for London Borough of Camden. August 2009.

44 London Borough of Camden. 2010. 2009 Progress Report for London Borough of Camden. June 2010.

45 DEFRA, 2009, Local Air Quality Management Technical Guidance LAQM.TG (09)

12. Archaeology

Introduction

12.1. This Chapter, which was prepared by Waterman Energy, Environment & Design Ltd, presents an assessment of the likely significant effects of the anticipated demolition and construction works associated with each of the three Development Scenarios on buried heritage (archaeology).

12.2. This Chapter provides a summary of relevant planning policy and a description of the methods used in the assessment. This is followed by a description of the assumed future baseline conditions of the Site and surrounding area, and an assessment of the potentially significant effects of each Development Scenario during the construction works. Mitigation measures are identified where appropriate to avoid, reduce or offset any potentially adverse effects, and the nature and significance of the likely residual effects are described.

12.3. The assessment presented in this Chapter draws on a desk-based Buried Heritage (Archaeology) Assessment, which is presented in Appendix 12.1. The assessment of the likely significant effects of each of the three Development Scenarios on built (above ground) heritage is presented separately in Volume 3: *Townscape, Visual and Built Heritage Assessment*.

Legislation, Planning Policy and Guidance

National Planning Policy

National Planning Policy Framework, 2012

12.4. The National Planning Policy Framework (NPPF)[1] sets out the Government's planning policies for England and how these are expected to be applied. The NPPF seeks a commitment to "*conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations*".

12.5. The NPPF stipulates that in determining a planning application, Local Planning Authorities (LPA), should require an applicant "*to describe the significance of any heritage assets affected, including any contribution made by their setting*". As a minimum, the historic environment record must be consulted and, where appropriate, the heritage assets assessed using appropriate expertise. Where a site may have heritage assets with archaeological interest, an appropriate desk-based assessment should be undertaken and, where necessary, a field evaluation will be undertaken to further inform planning decisions.

12.6. The NPPF acknowledges that "*heritage assets are irreplaceable, any harm or loss should require clear and convincing justification*". In terms of development that could potentially affect, directly or indirectly, non-designated heritage assets, a balanced judgement will be required taking into account the scale of any harm or loss and the significance of the non-designated heritage asset.

Regional Planning Policy

The London Plan: Spatial Development Strategy of Greater London, 2011

12.7. The adopted London Plan[2] contains Policy 7.8 'Heritage Assets and Archaeology' which supports the protection of archaeological and cultural heritage assets.

Revised Early Minor Alterations to the London Plan, 2012

12.8. The Revised Early Minor Alterations to the London Plan[3], which was produced to ensure consistency with the NPPF, was published in June 2012 for public consultation. Amendments were proposed to Policy 7.8 'Heritage Assets and Archaeology' of the adopted London Plan to support of the NPPF and includes the following:

"*Where a development proposal will lead to less that substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of a proposal, including securing its optimum viable use. Enabling development that would otherwise conflict with planning policies, but which would secure the future conservation of a heritage asset should be assessed to see if the benefits of departing from those policies outweigh the disbenefits".*

"*Where there is evidence of deliberate neglect of and or damage to a heritage asset that deteriorated state of that asset should not be taken into account when making a decision on a development proposal*".

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

12.9. Policy DM3 'Heritage' of the emerging Development Management Policies Submission[4] for the London Borough of Islington (LBI) addresses the protection of the historic environment. Specific to this assessment, Policy DM3 stipulates that archaeological remains should be preserved *in situ*. Where this cannot be achieved, measures must be taken to investigate and record remains in advance of the works.

London Borough of Islington's Site Allocations Submission, 2012

12.10. Buried heritage is not addressed in the Site Allocations Submission[5] for the LBI.

London Borough of Islington's Finsbury Local Plan Submission, 2012

12.11. Objective 5 of the emerging Finsbury Local Plan[6] is "*To enhance and make the most of the area's heritage and culture*". This includes the conservation and enhancement of the historic built environment and the promotion of investment to make the area's culture and heritage more accessible to residents and visitors. Policy BC6 'North Clerkenwell and Mount Pleasant' makes no reference to the buried historic environment.

London Borough of Islington's Core Strategy, 2011

12.12. Strategic Policy CS9 'Protecting and Enhancing Islington's Built and Historic Environment' of the adopted Core Strategy[7] states that "*the historic significance of Islington's unique heritage assets and historic environment will be conserved and enhanced whether designated or not. These assets in Islington include individual buildings and monuments, parks and gardens, conservation areas, view, public spaces and archaeology*".

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

12.13. Policies D43 to D47 of LBI's Unitary Development Plan[8] address archaeological heritage, assessment and evaluation. These policies stipulate that LBI would seek to:

- Preserve the most important archaeological remains and their settings;
- Refuse planning permission for applications which adversely affect important archaeological remains and their settings;
- Where the presence of archaeological remains have been confirmed, applicants would be required to demonstrate that they would be preserved *in situ*; and
- Where the preservation of archaeological remains is not justified, applicants would be required to provide mitigation through the investigation and recording of remains prior to development.

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

12.14. The Site Allocations' Proposed Submissions Document for the London Borough of Camden (LBC)[9] states that Policy CS14 'Promoting High Quality Places and Conserving Our Heritage' of the adopted Core Strategy[10] should be considered when determining the planning approach for specific sites within LBC.

London Borough of Camden's Core Strategy, 2010-2025, 2010

12.15. The aforementioned Policy CS14 of the adopted Core Strategy addresses heritage within the administrative area of LBC. This policy focusses on the Borough's extant built heritage, but does state that LBC will ensure that Camden's places and buildings are attractive, and safe and easy to use, by "*preserving and enhancing Camden's rich and diverse heritage assets and their settings, including conservation areas, listed buildings, archaeological remains, scheduled ancient monuments and historic parks and gardens"*;

London Borough of Camden's Development Policies 2010-2025, 2010

12.16. LBC's adopted Development Policies[11] includes Policy DP25 'Conserving Camden's Heritage' states that "*The Council will protect remains of archaeological importance by ensuring acceptable measures are taken to preserve them and their setting, including physical preservation, where appropriate*".

Mount Pleasant Supplementary Planning Document, 2012

12.17. The 'Mount Pleasant Supplementary Planning Document'[12] (SPD) notes that redevelopment on the Site should protect and enhance Camden's and Islington's built and historic environment. The SPD specifies that Policy 7.8 'Heritage Assets and Archaeology' of the adopted London Plan is relevant to, and should be considered, when proposing redevelopment of the Site.

Assessment Methodology and Significance Criteria

Assessment Methodology

12.18. A qualitative archaeological desk-based assessment of the potential buried heritage on and within a 350m radius of the Site's centre (the study area) was undertaken. This study area permits an understanding of the Site's immediate historic context and the consideration of findings from heritage investigations around the Site. To inform the archaeological desk-based assessment, the following sources of information were reviewed:

- Greater London Historic Environment Record (GLHER) records of previously identified heritage assets (archaeological sites, monuments and find spots, as well as the locations of listed buildings and previous environmental and archaeological investigations);
- Information contained within the Camden Local Studies and Archives Centre, the Islington Local History Centre, the British Postal Museum and Archive (BPMA), English Heritage's on-line databases and the National Monuments Record (NMR);
- A review of previous ground investigations reports, including an investigation undertaken by MoLAS (now MOLA) in 1993 on the Calthorpe Street site[13] and a watching brief undertaken in 2012 by Compass Archaeology near the junction of Rosebery Avenue and Mount Pleasant[14]; and
- Landmark EnviroCheck historic maps.

12.19. The Site was also visited on 12th October 2012 to identify the ground conditions and any remains of previously recorded sites or any previously unidentified remains.

12.20. The above sources of information were used to assess the significance and predict the nature, extent and preservation state of buried heritage receptors that may be present within the Site. For the purposes of this assessment it was assumed that current archaeological potential of the Site would also be applicable to the future conditions and therefore formed the baseline of this assessment.

12.21. The archaeological desk-based assessment followed best practice procedures set out in the 'Standards and Guidance: Desk-Based Assessments' produced by the Institute for Archaeologists[15] and contained in the NPPF. It also took into account English Heritage's guidance in 'The Setting of Heritage Assets'[16]. The assessment methodology was based on that outlined in the Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3 Part 2[17], in the amended document HA 208/07 issued by the Highways Agency in August 2007. Although this was written for road schemes in particular, it is accepted as a general best-practice approach to archaeological desk-based assessment.

12.22. English Heritage (GLAAS) was also consulted with regard to the assessment, although a response had not been received at the time of undertaking this assessment.

Significance Criteria

12.23. The DMRB[18] methodology sets out the criteria for determining the significance of archaeological remains, together with the magnitude of the effect.

12.24. The significance of an effect is generally determined as the combination of the 'sensitivity and / or value' of the affected environmental receptor and the predicted 'extent' and / or 'magnitude' of the effect or change. The assessment of significance ultimately relies on professional judgement, although comparing the extent of the effect with criteria and standards specific to each topic can guide this judgement.

12.25. The determination of the value of receptors (sites and features) was based mainly on existing designations, but professional judgement was also applied where features were found which did not have any formal national or local designation.

12.26. Details of the criteria specific to this assessment for archaeological remains are set out in Table 12.1 and Table 12.2.

Table 12.1: Receptor Sensitivity / Value of Archaeological Remains

Receptor Sensitivity / Value	Description
Very High	• World Heritage Sites (including nominated sites); • Assets of acknowledged international importance; and • Assets that can contribute significantly to acknowledged international research objectives.
High	• Scheduled Monuments (SMs) (including proposed sites); • Undesignated assets of schedulable quality and importance; and • Assets that can contribute significantly to acknowledged national research objectives.
Medium	• Designated or undesignated assets that contribute to regional research objectives.
Low	• Designated and undesignated assets of local importance; • Assets compromised by poor preservation and / or poor survival of contextual associations; and • Assets of limited value, but with potential to contribute to local research objectives.

Source: DMRB HA208/07 Annex 5 Table 5.1[19]

12.27. There are a number of variables in determining magnitude of change. These include the sensitivity or vulnerability of a site to change (for example, depth of alluvium, or the presence of Made Ground, the nature of past development or management effects, and the differing nature of development processes such as piling and topsoil stripping.

Table 12.2: Magnitude of Effect for Archaeological Remains

Magnitude of Effect	Description
Major	The Development Scenario would cause a large change to existing environmental conditions. Change to most or all key archaeological materials, such that the resource is totally altered.
Moderate	The Development Scenario would cause a noticeable change to existing environmental conditions. Changes to many key archaeological materials, such that the resource is clearly modified.
Minor	The Development Scenario would cause a small change to existing environmental conditions. Changes to key archaeological materials, such that the asset is slightly altered.
Negligible	The Development Scenario would cause no discernible change to existing environmental conditions. Very minor changes to archaeological materials.

Source: DMRB HA208/07 Annex 5 Table 5.2[20]

12.28. The significance criteria used in this assessment, which were determined by the sensitivity and magnitude of change, are presented in Table 12.3, with the definitions provided in Table 12.4.

Table 12.3: Significance Matrix

Receptor Sensitivity / Value	Magnitude of Effect			
	Major	**Moderate**	**Minor**	**Negligible**
Very High	Major	Major	Moderate	Negligible
High	Moderate	Moderate	Minor	Negligible
Medium	Moderate	Minor	Minor	Negligible
Low	Minor	Minor	Negligible	Negligible

Table 12.4: Significance Criteria

Criteria	Description
Adverse Effect of Substantial Significance	Development resulting in the degradation of a cultural heritage site of national or international importance and / or extensive long term change to the setting of such a site including SMs. Destruction of heritage of regional value.
Adverse Effect of Moderate Significance	Development resulting in the degradation of an archaeological site of regional importance and / or extensive long term change to the setting of such a site. Destruction of locally important heritage assets.
Adverse Effect of Minor Significance	Development resulting in the degradation of locally important archaeological remains or their setting. Slight change to the long term below ground structure of a Grade II listed building.
Negligible	No perceptible change in the condition or setting of designated of the heritage asset.
Beneficial Effect of Minor Significance	Perceptible improvement in the below ground structural condition of a Grade II or locally listed building. Improved management of locally / regionally important heritage asset.
Beneficial Effect of Moderate Significance	Perceptible improvement in the below ground structural condition of a Grade I / II* listed building. Also, improved management of nationally important archaeological site. Major improvement in the below ground structural condition of a Grade II or locally listed building. Major improvement in the management of locally / regionally important archaeological site.
Beneficial Effect of Substantial Significance	Major improvement in the management or setting of nationally important heritage asset.

Future Baseline Conditions

Previously Identified Archaeology

12.30. The locations of the entries recorded on the GLHER are detailed in the desk-based Buried Heritage (Archaeology) Assessment presented in Appendix 12.1. The numbers prefixed with 'MLO' in the text are references to records of heritage assets on the GLHER. Full details of previously identified buried heritage assets are given in Appendix 12.1 and a summary provided below.

Designated Heritage

12.31. Neither the Calthorpe Street site or the Phoenix Place site contain any designated buried heritage assets, although the Phoenix Place site is partly located within the Archaeological Priority Area (APA) '*London Suburbs'* as designated by LBC. The designation relates to the late medieval and post-medieval expansion of the City of London from its Roman and medieval core. The designated area covers the northern part of the Phoenix Place site.

12.32. No part of the Calthorpe Street site is located in an APA.

Non-Designated Heritage

Prehistoric (up to 42 AD)

12.33. No prehistoric artefacts have been recorded on the Calthorpe Street site or the Phoenix Place site. The archaeological evaluation[21] undertaken on the Calthorpe Street site in 1993 found no buried prehistoric heritage assets.

12.34. However, the Hackney Gravel that predominates as the superficial deposits in the study area is a major source of Palaeolithic materials[22]. Evidence from this period includes a Palaeolithic hand axe [GLHER MLO1822] found 250m east of the Site, a concentration of Palaeolithic tools, a Mesolithic hand axe and a Neolithic hand axe found 150m west of the Site [GLHER MLO23431, MLO46117, MLO17696 and MLO17697] and a further collection of Palaeolithic artefacts were found 150m north of the Site at Kings Cross Road [GLHER MLO16262].

12.35. No heritage assets from the later prehistoric periods, namely the Bronze Age and the Iron Age, have been identified in the study area.

Roman (43AD to 409 AD).

12.36. There are no known Roman buried heritage assets within the Calthorpe Street site or the Phoenix Place site. The archaeological evaluation[23] undertaken on the Calthorpe Street site in 1993 found no buried Roman heritage assets.

12.37. Heritage assets from the Roman period found within the study area comprise three find spots. These include a *frollis* of Constantine I [GLHER MLO71745] greater than 200m south-east of the Site, a coin of Antoninianus of Carausius [GLHER MLO71746] greater than 200m south-east of the Site and a brass counterfeit of a barbarous radiate coin of Germanicus or Claudius [GLHER MLO17777] found in the Fleet Ditch at Gough Street, 20m south-west of the Site.

12.38. The Site is located outside of the Roman city of *Londinium*. Theobalds Road, located more than 200m south-west of the Site, is considered to be the northern Roman bypass for *Londinium* and the general area was, at the time, farmland [GLHER ELO12228].

Anglo-Saxon and Medieval (410 AD to 1540 AD)

12.39. There are no known buried heritage assets from the Anglo-Saxon or medieval periods in relation to the Calthorpe Street site or the Phoenix Place site. The archaeological evaluation undertaken on the Calthorpe Street site in 1993 found no buried heritage assets of Anglo-Saxon or medieval heritage assets.

12.40. The sole Anglo-Saxon buried heritage asset found within the study area relates to a cane chevron bead [GLHER MLO359] located 250m east of the Site. Re-used medieval masonry [GLHER MLO61482] was recorded 230m west of the Site, suggesting the presence of a large medieval building in the area.

12.41. The Site is located outside the main area of medieval activity to the south-east. The area around the Site was fertile meadowland within and close to the flood plain of the River Fleet[24].

Post Medieval (1540 AD to 1750 AD)

12.42. No buried heritage assets relating to the post medieval period have been recorded on the Phoenix Place site.

12.43. Artefacts were recovered approximately 200m south-east of the Site from the River Fleet. These included two bosses or buckles from targets depicting Henry VIII and several knives [GLHER MLO1666].

12.44. A well discovered in 1697 became the site of a bath house built by Baynes in the same year[25] [GLHER MLO25711], which is located less than 120m south-east of the Site on the present day Rosebery Avenue.

12.45. A site, whose name could reference the Cold Bath (though more probably 'London Spa' on the corner of the present day Amwell Street and Rosebery Avenue), is Spa Field Chapel [GLHER MLO25719], which was located approximately 160m east of the Site on modern day Exmouth Market. It was the first chapel of 'The Dissenters', who were also known as 'The Countess of Huntingdon's Connection'.

12.46. Within the eastern corner of the Mount Pleasant Sorting Office to the south of the Calthorpe Street site, the Rocque map of 1746 depicts four buildings with an orchard fronted by Farringdon Road (possibly named Coppice Row by Rocque), entitled 'Sir John Oldcastle's'. This is recorded on the GLHER as Sir John Oldcastle's mansion [GLHER MLO25710], but is noted by Drummond-Murray as being the tavern named the 'Sir John Oldcastle' or the 'Lord Cobham'. The tavern fell into disrepair and was demolished in 1762[26].

12.47. Rocque's map also depicts a collection of buildings and gardens, backed by the River Fleet, to the north of the Site at Black Mary's Hole. The River Fleet meanders across the Site (both the Calthorpe Street site and the Phoenix Place site) and, where is crosses Mount Pleasant (a triangular open space in the eighteenth century), is a collection of buildings. Rocque's map suggests a narrowing of the River Fleet valley at this point and, on the east side of the river, an elongated mound.

12.48. The archaeological evaluation[27] of the Calthorpe Street site identified at least two concentrated episodes of dumping in the same area on the east bank of the River Fleet (possibly the elongated mound depicted by Rocque) [GLHER MLO64265]. The dumping is reported to have been a distinct local landmark, "*a huge rubbish heap which had grown up on the site of an eighteenth century bathing place, known as Cold Bath Spring*".

Industrial Age (1751 AD to Present)

12.49. The Calthorpe Street site and Phoenix Place site remained as largely open space until the development of the Middlesex House of Correction (Coldbath Prison) in 1794 across the Calthorpe Street site on the east bank of the River Fleet[28 & 29]. A canalised ditch was depicted on Horner's 'Plan of Clerkenwell' from 1813 (see Appendix 12.1) flowing in a north-east to south-west direction, which drained a number of streams on the open land to the north-east of the Site into the River Fleet. By 1865, the Middlesex House of Correction had been expanded; details of which are provided in Appendix 12.1. By this time, the River Fleet was culverted and the course of the River Fleet represented by the administrative boundary between Clerkenwell, Saint Pancras and Saint Andrews.

12.50. Following closure of the prison in 1885[30], a Post Office occupied the Calthorpe Street site. Between 1889 and 1890, the first purpose-built Post Office was constructed, which occupied the majority of the Calthorpe Street site. However, this building was largely damaged by bombing in 1943 and was later demolished in the 1980s.

12.51. The Phoenix Place site was developed through the first half of the twentieth century with various works and factories. The Phoenix Foundry is noted as producing brass and iron on the OS map extract from 1952, which also shows a 'ruin' to the north-east of the foundry, a garage, a public house fronting Gough Street (the 'Two Brewers') and a 'food factory' to the west. By 1971 the entire Phoenix Place site was cleared of extant buildings, except for Petrone House in the north-western part of the Phoenix Place site.

12.52. The MoLAS' evaluation of the Calthorpe Street site recorded a series of deep, brick foundations that align with the prison's plan [GLHER MLO64267 & MLO64261]. These were recorded to extend to depths of up to 9.5m Above Ordnance Datum (AOD) and extend as high as 14.30m AOD, though most had been truncated to upper levels of 13.70m AOD. Remains of the prison were only seen to survive between the Post Office Railway Depot (along the western edge of the Calthorpe Street site) and the footings and basement of the original Sorting Office (located in the centre of the Calthorpe Street site). A series of watching briefs conducted by Compass Archaeology in 2012 included a watching brief on a trench on the western side of Rosebery Avenue at the junction with Mount Pleasant. The remains of a substantial wall, aligned north-north-east south-south-west were found.

The River Fleet

12.53. As the River Fleet approaches the Site from the north, it originally meandered across the north-west corner of the Calthorpe Street site.

12.54. The aforementioned archaeological evaluation of the Calthorpe Street site records the channel of the River Fleet to the east of the Post Office Railway Depot extending under the north-west corner of the Mount Pleasant Sorting Office [GLHER MLO64263]. At this point, sediments from the River Fleet are seen as deep as 10.8m AOD[31].

12.55. The River Fleet is joined by two further streams within the Site. The first, flowing west across the north of the Calthorpe Street site is now culverted with its base on the Farringdon Road boundary as 12.80m AOD and at the Phoenix Place boundary as 11.12m AOD[32]. The second joined the River Fleet beside or under the aforementioned foundry on the Phoenix Place site. It is possible that some remains of this survive in the south-west corner of the Site.

12.56. Having been culverted by 1862, the River Fleet now approaches the Site under Pakenham Street and flows between under the road, Phoenix Place[33].

Archaeological Potential

Calthorpe Street Site

12.57. As set out in the baseline above, there is evidence in the vicinity of the Calthorpe Street site for buried heritage assets surviving from prehistory into the post-medieval period. However, none of the aforementioned ground investigations recovered any direct archaeological evidence from these periods.

12.58. The archaeological evaluation undertaken by MoLAS in 1993 on the Calthorpe Street site identified deep sedimentary and alluvial deposits laid by the River Fleet. Environmental analysis of a sample of these deposits indicates that the former channels of the River Fleet are a rich source of historic environmental data. As such, the deposits are of regional importance because geoarchaeological and environmental analysis of the River Fleet would contribute to regional research objectives. These deposits' potential can, therefore, be described as being of medium value.

12.59. Waste dumping on the Calthorpe Street site from the medieval period onwards and artefacts washed down in the River Fleet would provide archaeological data on industrial activities, diets and other social indicators. However, owing to their local and residual nature, their value is considered to be low.

12.60. The MoLAS and Compass Archaeology evaluations also identified the survival of extensive brick footings to the former Middlesex Prison of Correction and elements of the development associated with the original Post Office. These could be described as being of low value.

12.61. The Calthorpe Street site has been the subject of deep and extensive truncation by development between the eighteenth and twentieth Centuries, particularly as a result of the creation of the '*Bathtub*' and Mail Rail station and tunnels and the River Fleet Sewer Branch. However, the areas of the Calthorpe Street site that fronts onto Calthorpe Street and Farringdon Road are unlikely to have faced any significant truncation.

12.62. Given the above, the main potential for survival is of palaeo-environmental riverine deposits laid down by the River Fleet. There is a low potential for the survival of isolated artefacts from the prehistoric to medieval periods and a moderate potential for the survival of buried heritage assets associated with the Middlesex House of Correction, together with a high potential for the survival of buried heritage assets associated with the original Post Office, which have been evaluated as being of low value.

Phoenix Place Site

12.63. As for the Calthorpe Street site, there is evidence in the vicinity of the Phoenix Place site for buried heritage assets surviving from prehistory into the post medieval period. The archaeological evaluation on the Calthorpe Street site identified deep sedimentary and alluvial deposits, which would contribute to regional research objectives. These deposits, which are also likely to be present on the Phoenix Place site can, therefore, be described as being of medium value.

12.64. The Phoenix Place site will have been the subject of truncation from development from the eighteenth century through to the twentieth century. The level of truncation is likely to be of a much more shallow nature compared to the Calthorpe Street site, because there is no evidence of any large, basemented buildings having been built.

12.65. Given the above, the main potential for survival is of palaeo-environmental riverine deposits laid down by the River Fleet. On the Phoenix Place site, there is a low potential for the survival of pre-1540 buried heritage assets and a moderate potential for the survival of eighteenth to twentieth century survival of buildings' footings (such as from the Phoenix Foundry), both of which have been evaluated as being of low value.

Potential Effects

Demolition and Construction

Effects of Demolition of Buildings on Buried Heritage Assets

Development Scenario 1

12.66. A number of buildings on the Phoenix Place site would be demolished including the former Rail Mail House (Petrone House) and outbuildings to the rear of Calthorpe House, 15 to 20 Phoenix Place, together with remnants of building walls across the Phoenix Place site. Demolition on the Calthorpe Street site would comprise the removal of existing stores, ramps and the Loading Canopy / Enclosure (see Chapter 6: *Development Programme, Demolition and Construction* for further information). Groundworks associated with the demolition of the buildings and structures on the Calthorpe Street and Phoenix Place sites would likely be minimal. However, because they would include breaking out ground floor and basement slabs, they nevertheless have the potential to affect any below ground heritage assets, and / or their condition. Therefore, demolition activities have the potential to give rise to a negligible to minor magnitude of adverse effect on known and any buried heritage assets of a low to medium value. On this basis, the potential effect of demolition activities on known and any unknown buried heritage assets would be:

- **negligible** for assets of low value, such as deposits from the prehistoric to medieval period, and remains associated with the Middlesex Correction House and the original Post Office buildings; and
- **permanent**, **long-term**, **local**, **adverse** of **minor significance**, for assets of medium value, such as palaeo-environmental remains, whose condition can be indirectly affected by this stage of works.

Development Scenario 2

12.67. On the Calthorpe Street site, the principal potential for survival of buried heritage assets relates to the palaeo-environmental riverine deposits laid down by the River Fleet. Such deposits have been evaluated as being of medium value. Although these would be unlikely to be directly affected by demolition works, ground conditions can be affected (e.g. exposure of organic materials, leading to degradation by oxidation); causing indirect effects to the asset. In addition, there is a low potential for the survival of isolated artefacts from the prehistoric to medieval periods, and a moderate potential for the survival of buried heritage assets associated with the Middlesex House of Correction, and a high potential for the survival of buried heritage assets associated with the original Post Office, which have all been evaluated as being of low value. All of the above are susceptible to changes in ground conditions caused by demolition works, and likely to be affected by any demolition works that change current ground levels / surfacing.

12.68. Consequently, demolition activities would be expected to have a negligible to minor magnitude of effect on known and any unknown heritage assets of low to medium value. On this basis, the potential effect of demolition activities on the Calthorpe Street site would be:

- **negligible** for assets of low value, such as deposits from the prehistoric to medieval period, and remains associated with the Middlesex Correction House and the original Post Office buildings; and
- **permanent**, **long-term**, **local**, **adverse** of **minor significance**, for assets of medium value, such as palaeo-environmental remains.

Development Scenario 3

12.69. On the Phoenix Place site, in addition to the high potential for the survival of riverine deposits, which has been evaluated as being of medium value, there is low potential for the survival of pre-1540 buried heritage assets and a moderate potential for the survival of eighteenth to twentieth-century buildings' footings (such as from the Phoenix Foundry), both of which have been evaluated as being of low value.

12.70. Although demolition works on the Phoenix Place site would be more extensive than on the Calthorpe Street site, the magnitude of effect on known and any unknown heritage assets would remain negligible to minor. On this basis, the potential effect of demolition activities on the Phoenix Place site would be:

- **negligible** for assets of low value, such as deposits pre-1540 buried heritage assets and eighteenth to twentieth-century buildings' footings (such as from the Phoenix Foundry) which may survive within the Site; and
- **permanent**, **long-term**, **local**, **adverse** of **minor significance**, for assets of medium value, such as palaeo-environmental remains.

Effect of Excavations and New Foundations on Buried Heritage Assets

Development Scenario 1

12.71. During the construction phase, it is anticipated that earthworks would primarily involve constructing new piling (to a depth of approximately 32m below ground level (bgl)) and constructing piled and raft foundations for the Calthorpe Street Development. Since the new basement of the Calthorpe Street Development would be created largely by decking over part of the existing basement, excavation works on the Calthorpe Street site would largely be limited to the northern side of the '*Bathtub*', where the ground levels would be reduced by approximately 5.5m over an area of approximately 1,200m^3. Transfer slab foundations and piling for the Calthorpe Street Development would also require excavation to enable their construction. The basement of the Calthorpe Street Development would be surrounded by a reinforced concrete wall founded on a series of pile caps and piles, except where below-ground constraints are present.

12.72. For the Phoenix Place Development, earthworks would largely comprise the excavation of basements, and new piled foundations (to a depth of approximately 32m bgl) retained by a combination of a contiguous or secant piled walls. Owing to the topography of the Phoenix Place site, the basements are designed to cut into the natural slope. Therefore, the lowest finished floor levels of the basements in the Phoenix Place Development would be 8.10m AOD, 15.80m AOD and 17.50m AOD towards the southern and northern ends of the site respectively, resulting in the reduction of the ground level by approximately 5m and 2m respectively.

12.73. The above works have the potential to give rise to a moderate to major magnitude of effect on known and any unknown heritage assets considered to be of low to moderate value. Therefore, the potential effect on known and any unknown buried heritage as a result of the excavation and construction works associated with Development Scenario 1 would be:

- **permanent**, **long-term**, **local, adverse** of **minor significance** for heritage assets of low value, such as deposits from the prehistoric to medieval period, and remains associated with the Middlesex Correction House and the original Post Office buildings; and
- **permanent**, **long-term**, **local, adverse** of **moderate significance** for assets of medium value, such as palaeo-environmental remains.

Development Scenario 2

12.74. Owing to constructing new piling / foundations and the excavations for the Calthorpe Street Development, as described above, despite the deep and extensive truncation existing on the Calthorpe Street site, the excavation and construction activities still have the potential to give rise to a major magnitude of effect on known and any unknown heritage assets of low to medium value that survival below and around the truncated areas. On this basis, the potential effect on known and unknown buried heritage as a result of the excavation and construction works associated with Development Scenario 2 would be **permanent**, **long-term**, **local**, **adverse** of **minor significance**, for assets of low value, such as deposits from the prehistoric to medieval period, and remains associated with the Middlesex Correction House and the original Post Office buildings. For assets of medium value, such as palaeo-environmental remains, the excavation and construction works associated with Development Scenario 2 would be **permanent**, **long-term**, **local, adverse** of **moderate significance**.

Development Scenario 3

12.75. Owing to the extensive basement excavations likely to be required, together with any historical truncation on the Phoenix Place site expected to be shallow, the excavation and construction works have the potential to give rise to a major magnitude of effect on known and any unknown heritage assets of low to medium value. Therefore, the potential effect on known and any unknown buried heritage as a result of the excavation and construction works associated with Development Scenario 3 would be:

- **permanent**, **long-term**, **local**, **adverse** of **minor significance** for assets of low value, such as deposits pre-1540 buried heritage assets and eighteenth to twentieth-century buildings' footings (such as from the Phoenix Foundry) which may survive within the Site; and
- **permanent**, **long-term**, **local**, **adverse** of **moderate significance**, for assets of medium value, such as palaeo-environmental remains.

Completed Development

12.76. Once completed and occupied, none of the three Development Scenarios would give rise to any effects on buried heritage beyond those that have the potential to arise during the demolition and construction phases.

Mitigation Measures

Demolition and Construction

Effects of Demolition of Buildings on Buried Heritage Assets

Development Scenarios 1, 2 and 3

12.77. It is highly likely that significant palaeo-environmental deposits laid down by the River Fleet survive beneath the Site and that they would likely be disturbed during the demolition and earthworks associated with basement excavation and foundations. Consequently, a programme of geoarchaeological survey comprising one or two borehole transects across where these works would be likely to coincide with the course of the River Fleet (Phoenix Place site) together with microlith sampling from a number of suitably positioned trench sections elsewhere across both the Calthorpe Street and Phoenix Place sites would provide information about these deposits. It is recommended that this programme is carried out in advance of demolition (possibly during other geotechnical investigations) and could be secured by an appropriately worded condition on any planning permission for development on the Site.

Effect of Excavations and New Foundations on Buried Heritage Assets

Development Scenarios 1, 2 and 3

12.78. During the excavation and groundworks, a programme of archaeological monitoring and recording (a 'watching brief') would be undertaken. The archaeological monitoring and recording would be focused on the Phoenix Place site and those parts of the Calthorpe Street site which may not have been subjected to severe truncation. A watching brief could be secured through an appropriately worded condition on any planning permission for development on the Site.

Completed Development

12.79. Because completion and occupation of the three Development Scenarios would not give rise to any effects on buried heritage, no mitigation measures would be required at this stage of the Development.

Likely Residual Effects

Demolition and Construction

Effects of Demolition of Buildings on Buried Heritage Assets

Development Scenarios 1, 2 and 3

12.80. Whilst a programme of geoarchaeological surveys would mitigate the total loss of some palaeo-environmental deposits, these mitigation measures would not reduce the significance of the likely residual effect. As such, the likely residual effects of the Scenario 1 demolition works would remain as:

- **negligible** for assets of low value, such as deposits from the prehistoric to medieval period, and remains associated with the Middlesex Correction House and the original Post Office buildings; and
- **permanent**, **long-term**, **local**, **adverse** of **minor significance**, for assets of medium value, such as palaeo-environmental remains.

Effect of Excavations and New Foundations on Buried Heritage Assets

Development Scenario 1

12.81. Whilst a programme of archaeological monitoring and recording (a 'watching brief') would mitigate a total loss of any buried heritage assets, the mitigation measures would not reduce the significance of the likely residual effect. Therefore, the likely residual effects of groundworks for Development Scenario 1 would remain as:

- **permanent**, **long-term**, **local**, **adverse** of **minor significance** for heritage assets of low value, such as deposits from the prehistoric to medieval period, and remains associated with the Middlesex Correction House and the original Post Office buildings; and
- **permanent**, **long-term**, **local**, **adverse** of **moderate significance** for assets of medium value, such as palaeo-environmental remains.

Development Scenario 2

12.82. Whilst a programme of archaeological monitoring and recording (a 'watching brief') would mitigate a total loss of buried heritage assets, the mitigation measures are not likely to reduce the significance of the likely residual effect. Therefore, the likely residual effects for Development Scenario 2 would remain **permanent**, **long-term**, **local**, **adverse** of **minor significance**, for assets of low value, such as deposits from the prehistoric to medieval period, and remains associated with the Middlesex Correction House and the original Post Office buildings, and for assets of medium value, such as palaeo-environmental remains, **permanent**, **long-term**, **local, adverse** of **moderate significance**.

Development Scenario 3

12.83. Whilst a programme of archaeological monitoring and recording (a 'watching brief') would mitigate a total loss of buried heritage assets, the mitigation measures are not likely to reduce the significance of the likely residual effect. Therefore, the likely residual effects for Development Scenario 3 would remain:

- **permanent**, **long-term**, **local**, **adverse** of **minor significance** for assets of low value, such as deposits pre-1540 buried heritage assets and eighteenth to twentieth-century buildings' footings (such as from the Phoenix Foundry) which may survive within the Site; and
- **permanent**, **long-term**, **local**, **adverse** of **moderate significance**, for assets of medium value, such as palaeo-environmental remains.

Conclusion

12.84. The summary of potential effects, mitigation measures and resulting likely residual effects in relation to each of the three Development Scenarios is provided below in Table 12.5.

Table 12.5: Summary of Potential and Likely Residual Effects on Buried Heritage (Archaeology)

Issue	Potential Effect / Significance	Mitigation Measures	Likely Residual Effect
Demolition and Construction			
Development Scenario 1			
Effects of demolition on buried archaeology (except palaeo-environmental remains).	**Negligible.**	None required.	**Negligible**.
Effects of demolition on palaeo-environmental remains.	**Permanent**, **long-term**, **local adverse effect** of **minor significance**.	Programme of geoarchaeological surveys.	**Permanent**, **long-term**, **local adverse effect** of **minor significance**.
Effect of excavations and construction of the basement and foundations on buried archaeology (except palaeo-environmental remains).	**Permanent**, **long-term**, **local adverse effect** of **minor significance.**	An archaeological watching brief.	**Permanent**, **long-term**, **local adverse effect** of **minor significance**.
Effect of excavations and construction of the basement and foundations on palaeo-environmental remains.	**Permanent**, **long-term**, **local adverse effect** of **moderate significance**.	Programme of geoarchaeological surveys.	**Permanent**, **long-term**, **local adverse effect** of **moderate significance**.
Development Scenario 2			
Effects of demolition on buried archaeology (except palaeo-environmental remains).	**Negligible**.	None required.	**Negligible**.
Effects of demolition on palaeo-environmental remains.	**Permanent**, **long-term**, **local adverse effect** of **minor significance**.	Programme of geoarchaeological surveys.	**Permanent**, **long-term**, **local adverse effect** of **minor significance**.
Effect of excavations and construction of the basement and foundations on buried archaeology (except palaeo-environmental remains).	**Permanent**, **long-term**, **local adverse** of **minor significance**.	An archaeological watching brief.	**Permanent**, **long-term**, **local adverse** of **minor significance**.

Issue	Potential Effect / Significance	Mitigation Measures	Likely Residual Effect
Effect of excavations and construction of the basement and foundations on palaeo-environmental remains.	**Permanent, long-term, local adverse effect of moderate significance.**	Programme of geoarchaeological surveys.	**Permanent, long-term, local adverse effect of moderate significance.**
Development Scenario 3			
Effects of demolition on buried archaeology (except palaeo-environmental remains).	**Negligible**.	None required.	**Negligible**.
Effects of demolition on palaeo-environmental remains.	**Permanent**, **long-term**, **local adverse effect** of **minor significance**.	Programme of geoarchaeological surveys.	**Permanent**, **long-term**, **local adverse effect** of **minor significance**.
Effect of excavations and construction of the basement and foundations on buried archaeology (except palaeo-environmental remains).	**Permanent**, **long-term**, **local adverse** and of **minor significance**.	An archaeological watching brief.	**Permanent**, **long-term**, **local adverse** and of **minor significance**.
Effect of excavations and construction of the basement and foundations on palaeo-environmental remains.	**Permanent**, **long-term**, **local adverse** and of **moderate significance**.	Programme of geoarchaeological surveys.	**Permanent**, **long-term**, **local adverse** and of **moderate significance**.

References

1 Department for Communities and Local Government (DCLG) (2011) Draft National Planning Policy Framework Draft.
2 Greater London Authority (GLA), 2011. London Plan Spatial Development Strategy for London published July 2011
3 Greater London Authority (GLA), 2011. Revised Early Minor Alterations to the London Plan, 2012
4 London Borough of Islington (LBI), (2012). London Borough of Islington's Development Management Policies Submission, 2012
5 LBI, (2012). London Borough of Islington's Site Allocations Submission, 2012
6 LBI, (2012). London Borough of Islington's Finsbury Local Plan Submission, 2012
7. LBI, (2011). London Borough of Islington's Core Strategy, 2011
8. LBI, (2002). London Borough of Islington's Unitary Development Plan (Saved Policies), 2002
9 LBC, (2012). London Borough of Camden's Site Allocations Proposed Submission Document, 2012
10 LBC, (2012) London Borough of Camden's Core Strategy 2010 - 2025 Local Development Framework
11 LBC, (2012). London Borough of Camden's Development Policies 2010-2025, 2010
12.LBC and LBI, 2012. Mount Pleasant Supplementary Planning Document.
13. Museum of London Archaeology Service. 1993. *Mount Pleasant Post Office: An Archaeological Investigation*.
14. Compass Archaeology, May 2012. Thames Water, Victorian Mains Replacement Works in the vicinity of Mount Pleasant, Farringdon Road and Clerkenwell Road – London Boroughs of Islington and Camden (DMA Crouch Hill 70) – An Archaeological Watching Brief
15 Institute of Field Archaeologists (IFA) 2011 Standard and Guidance for Archaeological Desk-based Assessments Reading
16 English Heritage (EH) 2011 The Setting of Heritage Assets
17 Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3 Part 2, 2007
18 Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3 Part 2, 2007
19 Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3 Part 2, 2007
20 Design Manual for Roads and Bridges (DMRB) Volume 11, Section 3 Part 2, 2007
21 Museum of London Archaeology Service. 1993. *Mount Pleasant Post Office: An Archaeological Investigation*.
22 Museum of London, 2000. *The Archaeology of Greater London – An assessment of archaeological evidence for human presence in the area now covered by Greater London*.
23 Museum of London Archaeology Service. 1993. *Mount Pleasant Post Office: An Archaeological Investigation*.
24 Weinreb, B. Hibbert, C. Keay, J. & Keay, J., eds., 2008. *The London Encyclopaedia.* London: Macmillan
25 Museum of London Archaeology Service, 1993. *Mount Pleasant Sorting Office: An Archaeological Assessment of Proposed Development*.
26 Museum of London Archaeology Service, 1993. *Mount Pleasant Sorting Office: An Archaeological Assessment of Proposed Development*
27 Museum of London Archaeology Service. 1993. *Mount Pleasant Post Office: An Archaeological Investigation*.
28 House, G., 2012. A History of London Prisons. Barnsley: Wharcliffe Books.
29 Museum of London Archaeology Service. 1993. Mount Pleasant Post Office: An Archaeological
30 *Ibid*.
31 *Ibid*.
32 Adams Kara Taylor. 2009. *Plan of Existing Tunnels and Sewer Constraints*.
33 *Ibid*.

13. Ground Conditions and Contamination

Introduction

13.1 This Chapter, which was prepared by Waterman Energy, Environment & Design (Waterman EED), presents an assessment of the likely significant effects of each Development Scenario. In particular, consideration is given in the assessment to the likely significant effects on human health and the quality of controlled waters in relation to ground conditions and contamination.

13.2 This Chapter provides a summary of relevant planning policy and a description of the methods used in the assessment. This is followed by a description of the assumed future baseline conditions of the Site and surrounding area and an assessment of the potentially significant effects of each Development Scenario during the construction works and once completed and operational. Mitigation measures are identified, where appropriate, to avoid, reduce or offset any adverse effects identified, together with the nature and significance of likely residual effects.

13.3 This Chapter is accompanied by a Preliminary Environmental Risk Assessment (PERA), prepared by Waterman EED, which is provided as Appendix 13.1. The PERA relates to the both the Calthorpe Street site and the Phoenix Place site, and should be read in conjunction with this Chapter. This Chapter is also accompanied by a desk-based Explosive Threat Assessment of the Site, which is presented in Appendix 13.2.

Legislation, Planning Policy and Guidance

Legislation

13.4 Land contamination is regulated under several regimes including environmental protection, environmental permitting, waste management, planning and development control, and health and safety legislation.

Environmental Protection Act, 1990

13.5 Specific UK legislation on contaminated land is principally contained within Part IIA of the Environmental Protection Act (EPA) 1990[1]. The legislation endorses the principle of a 'suitable for use' approach to contaminated land, where remedial action is only required if there are unacceptable risks to human health or the environment, taking into account the use of the land and its environmental setting.

Contaminated Land (England) (Amendment) Regulations, 2012

13.6 The Contaminated Land (England) (Amendment) Regulations 2012[2] and accompanying statutory guidance (Department of Environment Food and Rural Affairs (DEFRA) Circular 01/2006[3]) describes a risk assessment methodology in terms of 'significant pollutants' and 'significant pollutant linkages' within a 'contaminant-pathway-receptor' conceptual model. The model comprises:

- The principal pollutant hazards associated with the site (the contaminants);
- The principal receptor(s) at risk from the identified hazards (for example, people, environmental assets, surface water and/or groundwater); and
- The existence, or absence, of plausible pathways which may exist between the identified hazards and receptor(s).

13.7 For land to be determined as 'contaminated' in a regulatory sense, and therefore requiring remediation (or a change to less sensitive use), all three elements (contaminant-pathway-receptor) of a significant pollutant linkage must be present. The legislation places a responsibility on the Local Planning Authority (LPA) to determine whether the land in its area is in such a condition, by reason of substances in, on or under the land that:

- "*significant harm is being caused or there is a significant possibility of such harm being caused; or*
- *significant pollution of controlled waters is being caused, or there is a significant possibility of such pollution being caused*".

13.8 LPAs rely heavily on the advice of the Environment Agency in relation to environmental matters for example in their approach to the analysis of pollution of controlled waters.

The Water Resources Act 1991 (Amendment) (England and Wales) Regulations, 2009

13.9 The Water Resources Act (as amended)[4] seeks to protect the quality of groundwater and surface water, collectively defined as controlled waters. The Water Resources Act (as amended) is of specific relevance to soil contamination in those cases where the nature, extent and mobility of contamination present a risk of pollution of controlled waters. In such cases, the land owner is committing an offence if the pollution of controlled waters is not prevented once the site has been identified as being a source of contamination.

13.10 In England and Wales, under The Water Resources Act (as amended) a works notice may be served by the regulator requiring appropriate investigation and clean-up.

Environmental Permitting (England and Wales) Regulations, 2010

13.11 The Environmental Permitting (England and Wales) Regulations 2010[5] make it a criminal offence to cause or knowingly permit a water discharge of any poisonous, noxious or polluting matter to controlled waters.

Building Regulations, 2010

13.12 The Building Regulations 2010 and specifically Approved Document C '*Site Preparation and Resistance to Contaminants and Moisture*'[6] outlines an approach for the assessment of contamination and preparation of sites prior to redevelopment.

National Planning Policy

National Planning Policy Framework, 2012

13.13 The National Planning Policy Framework[7] (NPPF) sets out the Government's planning policy for England and how this is expected to be applied to development. Paragraphs 120 to 122 of Section 11 'Conserving and Enhancing the Natural Environment' of the NPPF relates to contaminated land and states the following:

"*To prevent unacceptable risks from pollution and land instability, planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health, the natural environment or general amenity, and the potential sensitivity of the area or proposed development to adverse effects from pollution, should be taken into account. Where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.*"

"*Planning policies and decisions should ensure that:*

- *the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation;*
- *after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and*
- *adequate site investigation information, prepared by a competent person, is presented."*

In doing so, local planning authorities should focus on whether the development itself is an acceptable use of the land and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities."

Regional Planning Policy

The London Plan: Spatial Development Strategy for Greater London, 2011

13.14 Key policies of the adopted London Plan[8] relating to contaminated land are set out in Policy 5.21 'Contaminated Land'. The policy states that it is necessary that strategic partners are employed to ensure development of brownfield land does not result in significant harm to human health or the environment. It also states that appropriate measures should be taken to ensure that development on previously contaminated land does not activate or spread contamination.

Revised Early Minor Alterations to the London Plan, 2012

13.15 The Revised Early Minor Alterations to the London Plan[9], which was produced to ensure consistency with the NPPF, was published in June 2012 for public consultation. Amendments have been proposed to Policy 5.21 'Contaminated Land' and includes the addition of the following text:

"*Where potentially contaminating activities are proposed, development should include appropriate measures to mitigate any potential harmful effects*".

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

13.16 Policy DM34 'Healthy Development' of the London Borough of Islington's (LBI) Development Management Policies Submission[10] states that "*The council will require adequate treatment of any contaminated land before development can commence*".

London Borough of Islington's Site Allocations Submission, 2012

13.17 Neither ground conditions nor contamination is addressed in the Site Allocations Submission for Islington[11].

London Borough of Islington's Finsbury Local Plan Submission, 2012

13.18 Neither ground conditions nor contamination is addressed in the LBI Finsbury Local Plan Submission[12].

London Borough of Islington's Core Strategy, 2011

13.19 LBI's adopted Core Strategy[13] does not contain policies specific to ground contamination. However, Policy CS10 'Sustainable Design' states that: "*The council will seek to minimise Islington's contribution to climate change and ensure that the borough develops in a way which respects environmental limits and improves quality of life.*"

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

13.20 There are no saved policies with the LBI's Unitary Development Plan[14] that are relevant to ground contamination or pollution of controlled waters.

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

13.21 Neither ground conditions nor contamination is addressed in the London Borough of Camden's (LBC) Site Allocations Proposed Submission Document[15].

London Borough of Camden's Core Strategy, 2010-2025, 2010

13.22 There are no specific policies in the LBC's adopted Core Strategy[16] specifically relating to ground contamination. However, further to CS16 'Improving Camden's Health and Well-Being', the Core Strategy states the following:

"*In order to protect the health and well-being of local residents, workers and visitors, the Council will expect proposals for the redevelopment of sites that are known to be contaminated, have the potential to be contaminated, or are located in proximity to such sites to take appropriate remedial action to the Council's satisfaction.*"

Mount Pleasant Supplementary Planning Document, 2012

13.23 With respect to contaminated land on the Site, the Mount Pleasant Supplementary Planning Document[17] (SPD) states: "*There is the potential for historic contamination on the site and detailed investigation and risk assessment will need to be carried out by the developer. If required, any mitigation measures would need to be carried out prior to commencement of development*".

Guidance

The Model Procedures for the Management of Land Contamination, 2004

13.24 The Contaminated Land Reports (CLR) 'Model Procedures for the Management of Land Contamination' (CLR11)[18] provides the technical framework for applying a risk management process when dealing with contaminated land. The process involves identifying, making decisions on, and taking appropriate action to deal with land contamination in a way that is consistent with government policies and legislation within the UK. CLR11 procedures are intended to assist all those involved in dealing with land contamination, including landowners, developers, professional advisors, regulatory bodies and financial providers.

Islington Codes of Practice for Construction Sites

13.25 LBI's 'Code of Practice for Construction Sites'[19] stipulates the following:

- "*If land is contaminated it must be subject to investigation to determine what measures are needed to ensure it is safe for the purposed end-use;*
- *High Standards of pollution and dust control should be achieved by all site operators operating in Islington;*
- *Water produced as a result of site activities must be disposed of in line with the requirement of the Environment Agency and Thames Water Utilities Ltd*".

Guide for Contractors Working In Camden, 2008

13.26 LBC's 'Guide for Contractors Working In Camden'[20] stipulates the following:

- "*Best Practice Methodologies (BPM) must be put in place to mitigate dust from construction sites;*
- *Potentially contaminated sites must be investigated to determine the significant of the contamination and appropriate remedial measures carried out if required;*
- *All reasonable steps must be taken to prevent contamination during demolition and construction works; and*
- *Dangerous substances on the site must be stored in line with Control of Substances Hazardous to Health (COSHH) Regulations*".

Assessment Methodology and Significance Criteria

Assessment Methodology

13.27 A desk-based qualitative risk assessment of ground conditions and, in particular, contamination was carried out in general accordance with current UK guidance on the assessment of contaminated land, including relevant British Standards, and the Department of Environment, Food and Rural Affairs (DEFRA) CLR series, notably CLR11. These advocate the use of a tiered approach to the assessment of contaminated land whereby initial conceptual models are formulated and, where necessary, further refined through successive phases of ground investigation, risk assessment and, where appropriate, remediation.

13.28 The sensitive receptors, potential contamination and potential pathways relevant to the Calthorpe Street site and Phoenix Place site were identified by undertaking a PERA. The PERA (see Appendix 13.1) was based on undertaking the following:

- A Site walkover undertaken by Waterman EED on 9 October 2012;
- A review of Landmark Information Group data, dated September 2012;
- A review of geological (Geological Map, Sheet 256, North London, Solid and Drift Edition) and groundwater vulnerability maps for the area;
- A review of the findings of an intrusive geotechnical investigation on the Calthorpe Street site and Phoenix Place site, undertaken by Geotechnics Limited in 2005 (Geotechnics Limited, Report Reference PC051744);
- A review of British Geological Survey (BGS) borehole logs for Site; and
- Consultation with the LBI, LBC and the London Fire and Emergency Planning Agency to obtain information pertinent to the Site.

13.29 A desk-based Explosive Ordnance Threat Assessment was also undertaken by BACTEC for both the Calthorpe Street site and Phoenix Place site. The findings of the Explosive Ordnance Threat Assessment (see Appendix 13.2) were used to inform the assessment of the likely significant effects of unexploded ordnance presented in this Chapter.

Development of a Conceptual Risk Assessment Model

13.30 In order to evaluate the likely significant effects and likely residual contamination risks associated with the Site, a contaminant-pathway-receptor model was developed in line with the approach suggested in CLR11 relating to human health. Accordingly, the risk assessment presented in the PERA (see Appendix 13.1) includes:

- Identification of potential ground contamination contaminant(s);
- Identification of potential contamination pathway(s);
- Identification of potential contamination receptor(s);
- Identification of potential ground contamination risk(s); and
- Assessment of the relative significance of the potential ground contamination risk.

13.31 The contaminant-pathway-receptor model takes account of the potential for contaminant-pathway-receptor linkages present for the Calthorpe Street and Phoenix Place sites. This enables the environmental risk to be evaluated for each of the three Development Scenarios.

Significance Criteria

13.32 Contaminated land legislation and guidance focuses on the site-specific assessment of potential pollutant linkages. There is no specific methodology or guidance for the assessment of likely significant effects in relation to ground conditions and contamination. Significance criteria were therefore developed based on professional judgement and relevant experience, using the standard criteria adopted by Waterman EED, as outlined in Chapter 2: *EIA Methodology*.

13.33 For an adverse effect in respect of ground contamination to occur there must be a contaminant, pathway and receptor pollutant linkage. The significance of the effect depends on the value of the resource, the sensitivity of the receptor and the ways in which each Development Scenario could provide a pathway between a contaminant and the receptor. The significance of an effect partly depends on the timescales involved, i.e. short, medium or long-term, and the geographic extent of the area affected. The assessment was based on the following seven point scale of significance:

- **Substantial adverse:** severe or high risk to human health. The contamination risk would have the potential to result in a permanent reduction in the quality of a potable groundwater or a surface water resource of a local, regional or national importance and / or permanent or severe temporary detrimental effect upon animal or plant populations;
- **Moderate adverse:** moderate risk from contamination to human health, plant growth, controlled waters and safe occupancy of buildings. The contamination risk would have the potential to result in a severe temporary change to the quality of controlled waters and / or severe temporary harmful effects upon humans;
- **Minor adverse:** temporary and minor risk to human health. The contamination risk would have the potential to result in moderate, local-scale reduction in the quality of potable groundwater or surface water resources of local importance which would be reversible with time and / or reversible widespread reduction in the quality of groundwater or surface water resources used for commercial or industrial abstractions and / or a reversible detrimental effect on animal or plant populations;

- **Negligible:** no appreciable risk to human, animal or plant health, groundwater or surface water resources of any importance. Any contamination risks would result in minor and reversible effects;
- **Minor beneficial**: minor reduction in risk to human, animal or plant health. The benefit would also relate to a minor and local-scale improvement to the quality of potable groundwater or surface water resources and / or a moderate to significant improvement to the quality of groundwater or surface water resources used for commercial or industrial abstraction only;
- **Moderate beneficial**: moderate reduction in risk from contamination to human, animal or plant health and safe occupancy of buildings. The benefit would also relate to a moderate and local scale improvement to the quality of controlled waters; and
- **Substantial beneficial**: major reduction in risk to human, animal or plant health. The benefit would also relate to a significant local-scale or significant regional scale improvement to the quality of potable groundwater or surface water resources.

Future Baseline Conditions

Site Conditions

13.34 For the purposes of this assessment it was assumed that current ground conditions within the Site would also be applicable to the future conditions and therefore formed the baseline of this assessment.

Calthorpe Street Site

13.35 The Calthorpe Street site is largely used as a delivery and servicing yard for the adjacent Mount Pleasant Sorting Office, which is used for vehicle parking, loading and unloading, equipment and waste storage. A fuel filling station to the north of the '*Bathtub*' includes three pumps comprising two diesel pumps and one lubrication oil pump. The above ground fuel storage tanks that feed the pumps are located beneath the concrete ramp at the northern end of the '*Bathtub*'. Both diesel tanks hold approximately 22,000 litres whilst the lubricant oil tank holds 1,323 litres. The London Fire and Emergency Planning Agency has confirmed (see Appendix 13.1) that they do not hold records of buried tanks on the Site. Whilst hydrocarbon staining was not noted around the tanks, staining was noted around the pumps. A vehicle wash is located between the fuel filling station and the fuel storage tanks, where wash water is collected by channel drains which service the vehicle wash.

13.36 The Mail Rail station and associated tunnels are located beneath the centre of the Calthorpe Street site. The Mail Rail maintenance depot is located close to the south-western boundary of the Calthorpe Street site. Access to the Mail Rail station was not gained during the Site walkover.

13.37 The surface of the Calthorpe Street site largely comprises tarmac, which was noted as being in good condition, and other hard-standing comprising block paving. Areas of soft landscaping are present along the north-eastern boundary of the Calthorpe Street site.

13.38 According to the Landmark EnviroCheck Report, there are no licences or consents registered to the Calthorpe Street site.

13.39 Further details of the uses of the Calthorpe Street site, together with the surrounding land-uses, are provided in Appendix 13.1.

Phoenix Place Site

13.40 The Phoenix Place site is primarily used as a car park for staff of the Mount Pleasant Sorting Office. Vacant building and yards are present in the northern part of the Phoenix Place site. The surface across the car park area comprises compacted fill material and concrete, although where present the concrete surface is often in poor condition. Phoenix Place traverses the Phoenix Place site along the north-eastern boundary, linking Calthorpe Street and Mount Pleasant. According to the Landmark EnviroCheck Report, there are no licences or consents registered to the Phoenix Place site.

13.41 Further details of the uses of the Phoenix Place site, together with the uses surrounding the Phoenix Place site, are provided in Appendix 13.1.

Historical Land Uses of the Site

Calthorpe Street Site

13.42 Whilst the historical extracts relating to the late 1800s suggest that the Calthorpe Street site was undeveloped at this time, it is known that it was occupied by the Coldbath Field Prison. However, the 1896 map extract indicates that the Calthorpe Street site was subsequently occupied by a Post Office. By 1916, it had been redeveloped and was at this time occupied by a large single building. The Calthorpe Street site was redeveloped by 1992 to resemble the current configuration. Its historical uses of the Calthorpe Street site and immediate surrounding area are described in detail in Appendix 13.1.

Phoenix Place Site

13.43 By 1877, the Phoenix Place site was developed and appeared to comprise residential properties, a foundry and yards. Although the 1953 map extract does not indicate significant changes to the uses of the Phoenix Place site, it is known to have been occupied by garages and a factory at this time. The 1965 and 1992 map extracts indicate that the aforementioned buildings had been demolished during this time, after which there had been no significant change to its land uses. The historical uses of the Phoenix Place site and immediate surrounding area are described in detail in Appendix 13.1.

Unexploded Ordnance

13.44 As indicated within the BACTEC Explosive Ordinance Threat Assessment (see Appendix 13.2), the area immediately surrounding the Site was bombed during the Second World War. An incendiary bomb in 1943 resulted in a fire which gutted the vast majority the Post Office building on the Calthorpe Street site. As a result, the BACTEC Explosive Ordinance Threat Assessment indicates that there is a low to medium risk of unexploded ordnance in relation to both the Calthorpe Street site and the Phoenix Place site.

Geology and Ground Conditions

13.45 A summary of the geology beneath the Calthorpe Street site and Phoenix Place site is provided in Table 13.1 and details in Appendix 13.1.

Table 13.1: Site Geology

Stratum	Area Covered	Estimated Thickness	Typical Description
Made Ground	Phoenix Place site and Calthorpe Street site	1.3m to 9.2m (Calthorpe Street site) 1.4m to 5.2m (Phoenix Street site)	Clayey sandy gravelly material with fragments of brick and concrete
Alluvium Deposits	Beneath Phoenix Place site and the Calthorpe site.	0.8m to 2.2m	Sandy silt and clay with organic fragments
River Terrace Deposits (Hackney Gravels)	Majority of Phoenix Place site and Calthorpe Street site	3m to 12.8m	Sand gravels with rare clay
London Clay Formation	Phoenix Place site and Calthorpe Street site	4.8m to 12.6m	Silty clay
Lambeth Group	Phoenix Place site and Calthorpe Street site	12.9m to 18.4m	Mottled sandy Clay containing shell fragments
Thanet Sand Formation	Phoenix Place site and Calthorpe Street site	4.0m to 7.6m	Fine grained sand with rare clay
Upper Chalk Formation	Phoenix Place site and Calthorpe Street site	Full thickness not proved	White chalk with flints

Ground Stability

13.46 The Landmark EnviroCheck Report indicates that risks associated with compressible ground, and shrinking or swelling clays across the entire Site, are moderate. The Site is not in an area that could be affected by coal mining activities.

Ground Gas

13.47 According to information from the Health Protection Agency, the Site is not located in an area of elevated radon gas levels (a naturally occurring gas). Correspondingly, radon protection measures are not required in the development of new residential buildings or extensions.

13.48 There are no registered landfills within 500m of the Site. However, significant deposits of Made Ground and alluvial deposits were encountered on the Calthorpe Street site and Phoenix Place site, during a site investigation undertaken by Geotechnics Limited in 2005, which may be capable of generating ground gas.

Hydrology and Hydrogeology

Hydrology

13.49 There are no surface water features on either the Calthorpe Street site or the Phoenix Place site. The River Thames is located approximately 1.5km south of the Site and Regents Canal is located approximately 1km north of the Site.

13.50 The former River Fleet (now known as the Fleet River Sewer) flows beneath the road, Phoenix Place, in a southerly direction towards the River Thames. A smaller tributary of the River Fleet (now known as the River Fleet Branch Sewer) passes beneath the northern part of the Calthorpe Street site.

13.51 There are no recorded water discharge consents within 500m of the Site. The closest is located 530m north of the Site and relates to the discharge of effluent to a reservoir / borehole. However, this discharge consent has been revoked.

Hydrogeology

13.52 According to the Environment Agency website[21], the geological deposits underlying the Site are classified as per Table 13.2.

Table 13.2: Summary of Hydrogeological Properties of the Main Geological Strata

Stratum	Environment Agency Classification	Hydrogeological Significance
Made Ground	Unproductive Strata	Negligible significance for water supply or river base flow
Alluvium	Secondary A Aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale
River Terrace Deposits (Hackney Gravels)	Secondary A Aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale.
London Clay Formation	Unproductive Strata	Low permeability with negligible significance for water supply or river base flow
Lambeth Group	Secondary A Aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale
Thanet Sand Formation	Secondary A Aquifer	Permeable layers capable of supporting water supplies at a local rather than strategic scale
Upper Chalk Formation	Principal Aquifer	High intergranular and / or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and / or river base flow on a strategic scale

13.53 The Site is not located within a groundwater Source Protection Zone.

13.54 Groundwater in the Secondary A Aquifers above the London Clay Formation is expected to flow towards the River Thames.

13.55 Groundwater level monitoring undertaken as part of the 2005 intrusive geotechnical investigation encountered groundwater levels beneath the Calthorpe Street site between 4.02m and 47.23m (level recorded in the Upper Chalk Formation) below ground level (bgl). Beneath the Phoenix Place site, groundwater was recorded between 2.59m bgl and 9.08m bgl.

13.56 One groundwater abstraction is recorded in the Landmark EnviroCheck Report within 500m of the Site. This is located 370m north-east of the Site and operated by Thames Water Utilities Ltd as a potable water supply. Although not identified in the Landmark EnviroCheck Report, it is presumed that the extraction is coming from the Principal Aquifer in the Upper Chalk Formation.

13.57 The nearest pollution incident to controlled waters recorded in the Landmark EnviroCheck Report relates to the release of 'fire water / foam' approximately 675m south-west of the Site. The incident was categorised as a 'Category 3 – Minor Incident'.

Conceptual Risk Assessment Model

13.58 A summary of potential sources of pollution which may have resulted in localised contamination of underlying soils and groundwater at the Calthorpe Street site and the Phoenix Place, together with potential pathways and receptors, are provided in Table 13.3. The risk to the receptor shown without any mitigation. The potential contaminant-pathway-receptor linkages identified in Table 13.3 are considered pertinent to both the Calthorpe Street site and the Phoenix Place site.

Table 13.3: Contaminant-Pathway-Receptor Model

Receptor	Potential Contamination	Pathways	Risk
Human Health			
Site Users and Occupants	Potential contaminants relating to current and former land uses, particularly on the Phoenix Place site. The 2005 intrusive geotechnical investigation encountered hydrocarbon contamination in the shallow Made Ground near to the fuel station on the Calthorpe Street site.	Dermal contact, ingestion and inhalation	Low to medium
	Ground gas and / or vapour from alluvial deposits and Made Ground, particularly on the Phoenix Place site and from offsite sources.	Inhalation and accumulation in basement	Low to medium
Offsite Residents / Users	Potential contaminants relating to former land uses on Site.	Migration offsite and direct contact, inhalation and contaminated dust during construction	Low
Construction Workers	Potential organic and inorganic contaminants relating to former land uses on Site.	Direct contact, ingestion and inhalation	Low to medium
Property			
Structures on the Site	Potential organic and inorganic contaminants relating to former land uses on Site.	Direct contact	Low to medium
Controlled Waters			
Secondary A Aquifer, Alluvium Deposits and Hackney Gravels	Potential contaminants relating to current and former land uses, particularly on the Phoenix Place site. The 2005 intrusive geotechnical investigation encountered hydrocarbon contamination in the shallow Made Ground near to the fuel station on the Calthorpe Street site.	Vertical and lateral migration through permeable deposits	Low to medium
Principal Aquifer within Upper Chalk Formation	Potential contaminants relating to current and former land uses, particularly on the Phoenix Place site. The 2005 intrusive geotechnical investigation encountered hydrocarbon contamination in the shallow Made Ground near to the fuel station on the Calthorpe Street site.	No pathway	None

Potential Effects

Demolition and Construction

13.59 A Conceptual Site Model illustrating the relationship of each Development Scenario and the ground conditions is included as Figure 13.1.

Effects on Construction Workers and General Public from Ground Contamination

Development Scenario 1

13.60 Earthworks would primarily involve breaking out slab and constructing new piling and foundations on the Calthorpe Street site and excavation of basements, piling, new foundations and ground works on the Phoenix Place site. Such works could disturb and expose demolition and construction workers to localised potential ground contamination through dermal contact, inhalation and / or ingestion pathways, which would have been previously contained and effectively isolated beneath hard-standing on the Calthorpe Street site and beneath the ground surface on the Phoenix Place site. There is also the potential for ground gas to emanate from organic matter and / or chemical contamination present beneath the entire Site and accumulate in poorly ventilated confined spaces such as services excavations and trenches. Therefore, demolition and construction workers could be exposed to ground gases through the inhalation of gases and vapours, when required to work in confined spaces.

13.61 Demolition and construction workers would be subject to mandatory health and safety requirements under the Construction (Design and Management) Regulations 2007[22] and the Control of Substances Hazardous to Health (COSHH) Regulations 2002[23]. Demolition and construction workers and visitors would therefore be required to use appropriate personal protective equipment (PPE) and respiratory protective equipment (RPE), thereby minimising the risk of exposure to potentially contaminated soils, dust, ground gas and perched groundwater.

13.62 In areas of earthworks and stockpiled material on both the Calthorpe Street site and Phoenix Place site dust could be generated during dry and windy conditions. Under these conditions, the general public using footpaths surrounding the Site, together with construction workers and occupants of the surrounding residential properties, could be exposed through inhalation of potentially contaminated dust.

13.63 Adherence to the legislative requirements described above would significantly reduce the health risk posed to demolition and construction workers on the Site by minimising the risk of direct and / or indirect inhalation, ingestion or contact with contaminated soil, dust, groundwater, ground gas or contaminated surface water runoff. Given the legislative requirements, together with ground contamination expected to be localised, the likely effect on demolition and construction workers and the general public would be **negligible**.

Development Scenario 2

13.64 Earthworks on the Calthorpe Street site would primarily comprise piling operations and a small basement extension of approximately 1,200m2 on the northern side of the 'Bathtub'. There would also be significant transfer slab foundations for the Calthorpe street site which would require excavations to enable their construction. However, given the legislative requirements described above for Development Scenario 1, together with ground contamination expected to be localised on the Calthorpe Street site, the likely effect on demolition and construction workers and the general public would be **negligible**.

Development Scenario 3

13.65 Earthworks on the Phoenix Place site would primarily comprise basement excavations and piling. The basements would be retained with either contiguous or secant piled walls. Given the legislative requirements described above for Development Scenario 1, together with ground contamination expected to be localised on the Phoenix Place site, the likely effect on demolition and construction workers and the general public would be **negligible**.

Effects on Construction Workers and General Public from Unexploded Ordnance

Development Scenario 1

13.66 As indicated in the BACTEC Explosive Ordinance Threat Assessment (see Appendix 13.2), there is a risk of unexploded ordnance being present within the Site. Earthworks on the Calthorpe Street site would principally comprise piling operations and earthworks on the Phoenix Place site would largely comprise piling and basement excavation works. Based on the predicted low to moderate risk of unexploded ordnance being present within the Site, together with the disturbance to unexploded ordnance having the potential to cause severe harm to construction workers and the general public surrounding the Site, the potential effect on construction workers and the general public is considered to be **temporary**, **short-term**, **local, adverse** and of **moderate significance**.

Development Scenario 2

13.67 Based on the predicted low to medium risk of unexploded ordnance being present within the Calthorpe Street site, together with the disturbance to unexploded ordnance having the potential to cause severe harm to construction workers and the general public surrounding the Site, the potential effect on construction workers and the general public is considered to be **temporary**, **short-term**, **local**, **adverse** and of **moderate significance**.

Development Scenario 3

13.68 Earthworks on the Phoenix Place site would principally comprise excavation of the new basement and piling operations. Based on the predicted low to moderate risk of unexploded ordnance being present within the Phoenix Place site, together with the disturbance to unexploded ordnance having the potential to cause severe harm to construction workers and the general public surrounding the Site, the potential effect on construction workers and the general public is considered to be **temporary**, **short-term**, **local**, **adverse** and of **moderate significance**.

Effect on Quality of Controlled Waters

13.69 The only controlled waters in the immediate vicinity of the Site are groundwaters in the underlying Secondary and Principal Aquifers. The Fleet River Sewer (and the associated River Fleet Sewer Branch) is classified as a sewer, which discharges to the River Thames beneath Blackfriars Bridge. The likely indirect effects on the water quality of the River Thames are considered under the Effects on the Fleet River Sewer and River Fleet Sewer Branch.

Development Scenario 1

13.70 Continuous Flight Auger (CFA) piled foundations are proposed for the Calthorpe Street site and on the Phoenix Place site to a depth of approximately 32m bgl, which would be founded in the London Clay Formation. Piling would therefore not penetrate the full thickness of the London Clay Formation, which would prevent potential linkages and any localised ground contamination being mobilised to the Principal Aquifer. Thus, the potential effect on groundwater quality in the Principal Aquifer from piling operations would be **negligible**.

13.71 However, breaking through the concrete and piling through the superficial deposits, including Made Ground, on the Calthorpe Street site could create new pathways for contamination into the Secondary Aquifer beneath the Calthorpe Street site. However, owing to the poor quality and broken surface of the Phoenix Place site and likely existing downward migration of any contamination to the underlying Secondary A Aquifer, the piling operations would be unlikely to give rise to significant additional contamination within the Secondary Aquifer beneath this part of the Site. Since the Site is not located within a source protection zone and the Secondary Aquifer is not used for potable abstraction, the creation of any new pathways is not considered significant in terms of the groundwater quality in the Secondary Aquifer, which is already in hydraulic conductivity with overlying Made Ground. For these reasons, the potential effect of piling on groundwater quality in the Secondary Aquifer is considered to be **negligible**.

13.72 Exposure of potentially any localised contaminated soil on the Site to direct rainfall would likely result in **negligible effect** on the quality of the underlying Secondary Aquifer. This is because the concrete surface of the Calthorpe Street site would largely remain intact; being broken through only to facilitate individual piles, preventing downward migration of contaminants via percolating rainfall. On the Phoenix Place site, the poor quality surface currently allows rain water to percolate through Made Ground and potentially transporting contaminants into the Secondary Aquifer.

13.73 Although the any ground contamination within the Site is expected to be localised, new potential sources of contamination would likely be temporarily introduced to the Site. Piling and the removal of hard-standing could create new preferential pathways and therefore, in the absence of mitigation, there is the potential for a **temporary**, **adverse effect** of **minor significance** to occur in relation to the Secondary Aquifer.

Development Scenario 2

13.74 The depth of piled foundations on the Calthorpe Street site would not exceed 32m bgl and therefore would not penetrate the full thickness of the London Clay Formation, thus preventing potential linkages and any localised ground contamination being mobilised to the Principal Aquifer. Therefore, the potential effect on groundwater quality in the Principal Aquifer as a result of the piling operations is considered to be **negligible**.

13.75 Breaking through the concrete and piling through the superficial deposits on the Calthorpe Street site would have the potential to create new pathways for contamination into the Secondary Aquifer. Since the Calthorpe Street site is not located within a source protection zone and the Secondary Aquifer is not used for potable abstraction, the creation of any new pathways is not considered significant in terms of the groundwater quality in the Secondary Aquifer. For these reasons, the potential effect of piling on groundwater quality in the Secondary Aquifer is considered to be **negligible**.

13.76 Exposure of any localised contaminated soil on the Calthorpe Street site to direct rainfall would result in a **negligible effect** on groundwater quality in the Secondary Aquifer. This is because the concrete surface of the Calthorpe Street site would largely remain intact; being broken through only to facilitate individual piles, preventing downward migration of any contaminants via percolating rainfall.

13.77 Although any ground contamination within the Calthorpe Street site is expected to be localised, new sources of contamination would likely be temporarily introduced. Piling could create new contaminant-pathway-receptor linkages and therefore, in the absence of mitigation, there is the potential for a **temporary**, **adverse effect** of **minor significance** to occur in relation to the Secondary Aquifer.

Development Scenario 3

13.78 The depth of piled foundations on the Phoenix Place site would not exceed 32m bgl and therefore would not penetrate the full thickness of the London Clay Formation. For the reasons set out above for Development Scenarios 1 and 2, the potential effect on the Principal Aquifer as a result of the piling operations is assessed as being **negligible**.

13.79 Owing to the poor quality and broken surface of the Phoenix Place site and likely existing downward migration of any contamination to the underlying Secondary Aquifer, the piling operations would be unlikely to give rise to significant additional contamination within the Secondary Aquifer beneath this part of the Site. Furthermore, because the Phoenix Place site is not located within a source protection zone and the Secondary Aquifer is not used for potable abstraction, the creation of any new pathways is not considered significant in terms of the groundwater quality in the Secondary Aquifer. Therefore, the potential effect on groundwater quality in the Secondary Aquifer is assessed as being **negligible**.

13.80 Piling through superficial deposits and exposing any contaminated material during the basement excavation to rainwater would result in a **negligible effect** on groundwater quality in the Secondary Aquifer because the poor quality surface of the Phoenix Place site currently allows rainfall to percolate through Made Ground.

13.81 Although any ground contamination within the Phoenix Place site is expected to be localised, new sources of contamination would likely be temporarily introduced. During the construction works there would be a risk of fuel spillages directly or indirectly to the Secondary Aquifer, resulting in a **temporary, adverse effect** of **minor significance**.

Effect on the Fleet River Sewer and River Fleet Sewer Branch

Development Scenario 1

13.82 The Fleet River Sewer Branch passes beneath the north-western part of the Calthorpe Street site and the Fleet River Sewer which passes beneath Phoenix Place. Both sewers should be hydraulically separated from the surrounding material, although owing to the age of the sewers some infiltration of groundwater from the surrounding material cannot be ruled out.

13.83 The likely effects of piling on the Site on the Fleet River Sewer would be **negligible** because appropriate excavation and piling techniques would be agreed with Thames Water in accordance with Building Control Regulations 2010. A minimum horizontal clearance of between 2m and 3m would be maintained in accordance with safeguarding guidelines in order to reduce the risk of damage. This would ensure that the integrity of the sewers is not affected.

13.84 The likely effect of exposing the sewers to any contaminants migrating through the Made Ground via percolating rainwater during the piling operations on the Site would be **negligible** because the majority of the concrete surface would remain intact on the Calthorpe Street site; only being broken through to accommodate the piling works and on the Phoenix Place site the majority of the ground surface is of such poor quality that percolation of rainwater is already taking place.

13.85 During the construction works there would be a risk related to fuel / chemical spillages entering cracks or fissures in the Fleet River Sewer and the River Fleet Sewer Branch on the Calthorpe Street site via holes in the concrete surface made during the piling works and on the ground surface of the Phoenix Place site; causing an **adverse effect** of **temporary minor significance** on water quality within the sewer. However, given the dilution available within the sewer itself and in the River Thames into which it discharges, the potential effect on the latter is assessed as being **negligible**.

Development Scenario 2

13.86 The likely effects of piling operations in the Calthorpe Street site on the Fleet River Sewer and Fleet River Sewer Branch would be **negligible** because appropriate excavation and piling techniques would be agreed with Thames Water in accordance with Building Control Regulations 2010. A minimum horizontal clearance of between 2m and 3m would be maintained in accordance with safeguarding guidelines in order to reduce the risk of damage. This would ensure that the integrity of the sewers is not affected.

13.87 The likely effect of exposing the sewers to any contaminants migrating through the Made Ground via percolating rainwater during the piling operations on the Calthorpe Street site would be **negligible** because the majority of the concrete surface would remain intact on the Calthorpe Street site; only being broken through to accommodate the piling works.

13.88 During the construction works there would be a risk related to fuel / chemical spillages entering cracks and fissures of the Fleet River Sewer on the Phoenix Place site via the ground; causing an **adverse effect** of **temporary minor significance** on water quality within the sewer. However, given the dilution available within the sewer itself and in the River Thames into which it discharges, the potential effect on the latter is assessed as being **negligible**.

Development Scenario 3

13.89 The likely effects of piling operations in the Phoenix Place on the Fleet River Sewer would be **negligible** because appropriate excavation and piling techniques would be agreed with Thames Water in accordance with Building Control Regulations 2010. A minimum horizontal clearance of between 2m and 3m would be maintained in accordance with safeguarding guidelines in order to reduce the risk of damage. This would ensure that the integrity of the sewers is not affected.

13.90 The likely effect of exposing the sewers to any contaminants migrating through the Made Ground via percolating rainwater during the piling operations on the Phoenix Place site would be **negligible** and on the Phoenix Place site the majority of the ground surface is of such poor quality that percolation of rainwater is already taking place.

13.91 During the piling and basement excavation works in the Phoenix Place site there would be a risk related to material or fuel spillages entering cracks and fissures in Fleet River Sewer causing an effect of **temporary minor adverse significance** on water quality within the sewer. However, given the dilution available within the sewer itself and in the River Thames into which it discharges, the potential effect on the latter is assessed as being **negligible**.

Completed Development

Effect of Ground Contamination on Future Occupants and Visitors

Development Scenario 1

13.92 Although localised ground contamination would be expected to be present within the Made Ground, the risk posed to future inhabitants from exposure to contaminated soils is considered to be low for the following reasons:

- The excavation, removal and disposal of Made Ground associated with the construction of the Entire Development, particularly on the Phoenix Place site, would remove any contaminants from parts of the Site;
- The majority of the Site would be hard-landscaped or covered by buildings, forming a barrier between people and any contaminated soil; thereby preventing the creation of a pathway between contaminant and receptor; and
- New soft landscaped areas would largely be created above new basements, and therefore would largely be unlikely to be indirect contact with any residual Made Ground.

13.93 Given the above, it is considered that future occupants and users of the Entire Development would be unlikely come into contact or be exposed to contaminated soil and ground gas. Therefore, the potential effect on future occupants of and visitors to the Entire Development is assessed as being **negligible**.

Development Scenario 2

13.94 For the reasons set out for Development Scenario 1, the risk posed to future occupants and visitors from exposure to contaminated soils is considered to be low. On this basis, the potential effect on future occupants and of and visitors to the Calthorpe Street Development is assessed as being **negligible**.

Development Scenario 3

13.95 For the reasons set out for Development Scenario 1, the risk posed to future occupants and visitors from exposure to contaminated soils is considered to be low. On this basis, the potential effect on future occupants of and visitors to the Phoenix Place Development is assessed as being **negligible**.

Effect on Quality of Controlled Waters

Development Scenario 1

13.96 The Entire Development does not include land uses that are typically associated with giving rise to significant soil or groundwater contamination. In addition, the Entire Development would be largely drained hard-standing (i.e. buildings, roads and pedestrian routes), which would prevent the majority of rainwater infiltration into the ground. The presence of piles as a part of the Entire Development would create a potential contamination pathway into the Secondary Aquifer. However, given that much of the Made Ground would be removed and that groundwater in the Secondary Aquifer is already in hydraulic conductivity with Made Ground the potential effect on groundwater quality in the Secondary Aquifer owing to the presence of piles is assessed as being **negligible**.

Development Scenario 2

13.97 The Calthorpe Street Development does not include land uses that are typically associated with giving rise to significant soil or groundwater contamination. In addition, the Calthorpe Street Development would be largely drained hard-standing (i.e. buildings, roads and pedestrian routes), which would prevent the majority of rainwater infiltration into the ground. The presence of piles as a part of the Calthorpe Street Development would create a potential contamination pathway into the Secondary Aquifer. However, given that much of the Made Ground would be removed and that groundwater in the Secondary Aquifer is already in hydraulic conductivity with Made Ground the potential effect on groundwater quality in the Secondary Aquifer owing to the presence of piles is assessed as being **negligible**.

Development Scenario 3

13.98 The Phoenix Place Development does not include land uses that are typically associated with giving rise to significant soil or groundwater contamination. In addition, the Phoenix Place Development would be largely drained hard-standing (i.e. buildings, roads and pedestrian routes), which would prevent the majority of rainwater infiltration into the ground. The presence of piles as a part of the Phoenix Place Development would create a potential contamination pathway into the Secondary Aquifer. However, given that much of the Made Ground would be removed and that groundwater in the Secondary Aquifer is already in hydraulic conductivity with Made Ground the potential effect on groundwater quality in the Secondary Aquifer owing to the presence of piles is assessed as being **negligible**.

Effect of Contamination on Underground Infrastructure

Development Scenario 1

13.99 Whilst much of the Made Ground would be removed, particularly on the Phoenix Place site, where buried infrastructure would be exposed to potentially contaminated residual Made Ground, contamination-resistant concrete would be used. Consequently, the potential effect of any residual contamination on underground infrastructure would be **negligible**.

Development Scenario 2

13.100 Where buried infrastructure would be exposed to potentially contaminated Made Ground, contamination-resistant concrete would be used. Consequently, the potential effect of any residual contamination on underground infrastructure would be **negligible**.

Development Scenario 3

13.101 Whilst the majority of Made Ground would be removed, particularly on the Phoenix Place site, where buried infrastructure would be exposed to potentially contaminated residual Made Ground, contamination-resistant concrete would be used. Consequently, the potential effect of any residual contamination on underground infrastructure would be **negligible**.

Mitigation Measures

Demolition and Construction

Protection of Construction Workers and General Public from Ground Contamination

Development Scenarios 1, 2 and 3

13.102 A detailed Site Investigation (SI) and quantitative environmental risk assessment would be undertaken prior to demolition and construction works commencing for any of the Development Scenarios, to determine the full nature and extent of any ground contamination present, including ground gas. If required, a Remediation Strategy would be developed and agreed with the statutory authorities. The Remediation Strategy would then be implemented accordingly.

13.103 Whilst no significant adverse effects of ground contamination arising from demolition and construction works are identified above for any of the Development Scenarios, , precautions would be taken to minimise the exposure of construction workers and the general public to potentially harmful substances. Attention would be paid to restricting possible off-Site nuisance, such as that arising from any dust emission. Such precautions would be set out in the Construction Environmental Management Plan's (CEMP) for the Calthorpe Street site and the Phoenix Place site and would include:

- Personal hygiene, washing and changing facilities;
- Procedures for reporting unforeseen contamination;
- Implementing dust suppression methods, e.g. water spraying, wheel washing facility for vehicles leaving the Site;
- Collecting and appropriately discharging surface water runoff to minimise ponding; and
- Regularly cleaning Site roads and the adjacent public highway.

13.104 The exposure of demolition and construction workers to any ground gas would be monitored where Site workers enter confined spaces such as excavations.

13.105 The above measures would be carried out in accordance with the Health and Safety Executive publication 'Protection of Workers and the General Public during the Development of Contaminated Land'[24] and CIRIA Report 132, 'A Guide for Safe Working on Contaminated Sites'[25]. Prior to construction works commencing the principal Contractor would be required to prepare a Safety Method Statement, which would show how the safety of the work force and the public would be ensured.

Protection of Construction Workers and General Public from Unexploded Ordnance

Development Scenarios 1, 2 and 3

13.106 Given the risk identified by the unexploded ordnance assessment and the likely effects associated with the demolition and construction works for each Development Scenario, Explosive Ordnance Safety and Awareness Briefings would be given to all personnel conducting intrusive works on the Site. Shallow excavation works would be supervised by a suitably qualified unexploded ordnance engineer. An Intrusive Magnetometer Survey of all borehole and pile locations in medium risk areas would be undertaken down to a maximum bomb penetration depth. Should any unexploded ordnance be identified, this would be safely removed according to the instructions of the unexploded ordnance engineer.

Protection of Quality of Controlled Waters

Development Scenario 1, 2 and 3

13.107 A detailed SI and quantitative environmental risk assessment would be undertaken prior to demolition and construction works commencing for any of the Development Scenarios, to determine the full nature and extent of any contamination present, including within the groundwater. If required, a Remediation Strategy would be developed and agreed with the statutory authorities. The Remediation Strategy would then be implemented accordingly.

13.108 The Environment Agency's 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' describes various methods and scenarios for piling through contaminated land. This guidance recommends that a Foundation Works Risk Assessment (FWRA) is prepared. Whilst no significant adverse effects are identified in relation to the demolition and construction works of each Development Scenario, it is considered that with the application of an appropriate piling methodology, the risks to the Secondary Aquifer from piling works penetrating through potentially contaminated Made Ground would be reduced to an acceptably low level.

13.109 Spoil containing 'leachable' (i.e. potentially soluble or otherwise mobile) contaminants would be identified and suitably contained, by bunding or similar containment measures, to prevent the release of contamination directly to the ground. During demolition and construction, the potential for contamination of the underlying groundwater would be minimised through the implementation of CEMP's. The CEMP's would, *inter alia*, provide detail on the following:

- Procedures for the management of materials, spillages and spill clean-up, use of best practice construction methods and monitoring;
- The use of appropriately tanked and bunded storage areas for fuels, oils and other chemicals; and
- Measures to avoid surface water ponding, the collection and appropriate discharge of on-Site runoff.

Protection of the Fleet River Sewer and River Fleet Sewer Branch

Development Scenario 1, 2 and 3

13.110 The locations of the sewers are known, and works would take place in accordance with the Building Control Regulation 2010 and would be pre-agreed with Thames Water. Consequently, there would be no adverse effects on the integrity of the sewers as result of piling and excavation works on the Site.

13.111 Measures would be put in place to prevent spoil containing 'leachable' (i.e. potentially soluble or otherwise mobile) contaminants from entering the ground and potentially entering the sewers and, indirectly, the River Thames. This would be achieved, by bunding or similar containment measures. Unforeseen contamination encountered during piling works on the Calthorpe Street site, and piling and basement excavation works on the Phoenix Place site would be identified, and measures such as immediate removal localised bundling and/or localised control of runoff would be carried out to ensure that contaminated leachate cannot enter the ground and the sewers. During the construction works there is risk of fuel and material spillages entering the ground and the sewers. Appropriate measures would be put in place via the CEMP's to reduce the risk of spillages, including the following:

- Fuel and chemicals would be stored in suitably bunded areas with access controlled by the Site manager construction;
- Staff would be briefed in the procedures associated with reporting fuel spills and spill kits would be available on the Site at locations where work is taking place; and
- Construction staff would be briefed in the appropriate and correct use of spill kits.

Completed Development

Effect of Ground Contamination on Future Occupants and Visitors

Development Scenarios 1, 2 and 3

13.112 A detailed SI and quantitative risk assessment would be undertaken prior to construction works for any of the Development Scenarios commencing, to determine the nature and extent of any contamination present on the Site, including ground gas.

13.113 In terms of gas risk posed by any residual made ground both the Calthorpe Street site and the Phoenix Place site appropriate measures in accordance with guidance document CIRIA C665 London, 2007 would be incorporated in to the design of the structures to prevent ingress of ground gas and or vapours into void spaces in buildings;

13.114 If significant contamination in the near surface soils is encountered, a suitable thickness of clean topsoil would be placed in areas of soft landscaping.

Effect on Quality of Controlled Waters

Development Scenarios 1, 2 and 3

13.115 A detailed SI and quantitative risk assessment would be undertaken prior to construction works for any of the Development Scenarios commencing, to determine the nature and extent of any contamination present on the Site, including within the groundwater.

13.116 Whilst no significant adverse effects are identified above in relation to any of the Development Scenarios, the FWRA to be undertaken at the demolition and construction stage would recommend an appropriate method (or methods) to prevent groundwater contamination arising from the presence of the piles.

Effect of Contamination on Underground Infrastructure

Development Scenarios 1, 2 and 3

13.117 The potential effect of residual contamination on underground infrastructure is negligible. Therefore, mitigation measures are not required.

Likely Residual Effects

Demolition and Construction

Effects on Construction Workers and General Public from Ground Contamination

Development Scenarios 1, 2 and 3

13.118 The exposure of demolition and construction workers to any residual ground contamination and ground gases, and the general public to potentially contaminated dusts, would be minimised through the use of appropriate PPE / RPE and the implementation of the CEMP's. With the adoption of such measures, the likely residual effects on demolition and construction workers and the general public for each of the three Development Scenarios would be **negligible**.

Effects on Construction Workers and General Public from Unexploded Ordnance

Development Scenarios 1, 2 and 3

13.119 Providing the mitigation measures are implemented (as set out in paragraph13.106), the likely residual effects of the demolition and construction works from unexploded ordnance for each of the three Development Scenarios would be **negligible .**

Effect on the Quality of Controlled Waters

Development Scenarios 1, 2 and 3

13.120 Preparing a FWRA and implementing the CEMP's throughout the demolition and construction works associated with each Development Scenario would minimise the potential for the creation of new sources of contamination and new pathways to the underlying Secondary and Principal Aquifers. Consequently, the likely residual effects of piling, removal of hard-standing and introduction of new sources of contamination and pathways on the Secondary and Principal Aquifers would be **negligible**.

Protection of the Fleet River Sewer and River Fleet Sewer Branch Development Scenario 1

Development Scenarios 1, 2 and 3

13.121 Implementing the controls on piling and excavation works outlined above would likely result in a **negligible effect** on the integrity of the Fleet River Sewer and River Fleet Sewer Branch during demolition and construction activities on the Calthorpe Street and Phoenix Place sites.

13.122 With the implementation of the surface runoff and materials storage control measures outlined above via the CEMP's and FWRA, the likely residual effect on water quality in the Fleet River Sewer, River Fleet Sewer Branch and, indirectly on the River Thames, would be **negligible**.

Completed Development

Effect of Ground contamination on Future Occupants and Visitors

Development Scenarios 1, 2 and 3

13.123 If deemed necessary following the SI, implementing a Remediation Strategy and gas protection measures would ensure that both the Calthorpe Street and Phoenix Place sites would be suitable for their proposed uses and that there would be no unacceptable risk posed to future human receptors. Taking this into account, the likely residual effect of ground contamination on future occupants of and visitors to each of the three Development Scenarios would be **negligible**.

Effect on Quality of Controlled Waters

Development Scenarios 1, 2 and 3

13.124 Although the likely effect of each Development Scenario upon groundwater are identified as being negligible, the FWRA to be undertaken at the demolition and construction stage would recommend appropriate methodology to prevent groundwater contamination as a result of the existence of the piles. Therefore, the likely residual effect on groundwater quality in the Secondary Aquifer would be **negligible**.

Effect Contamination on Underground Infrastructure

Development Scenarios 1, 2 and 3

13.125 Assuming appropriate contaminant-resistant materials are used and the appropriate installation of services is carried out, the likely residual effect of contamination on underground infrastructure would be **negligible**.

Conclusion

13.126 A summary of the potential effects, mitigation measures and likely residual effects in relation to ground conditions and the three Development Scenarios is provided in Table 13.4 below.

Table 13.4: Summary of the Potential Effects, Mitigation Measures and Likely Residual Effects

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
Demolition and Construction			
Development Scenario 1			
Effects on construction workers and the general public from contaminated ground	**Negligible**	Implementation of a CEMP which would stipulate the use of PPE/RPE, health and safety planning, dust control and other site management measures.	**Negligible**
Effects on construction Workers and general public from unexploded ordnance	**Temporary**, **short-term**, **local, adverse** and of **moderate significance**	Explosive Ordnance Safety and Awareness Briefings. Shallow excavation works would be supervised by a suitably qualified unexploded ordnance engineer. An Intrusive Magnetometer Survey of all borehole and pile locations in medium risk areas would be undertaken down to a maximum bomb penetration depth.	**Negligible**
Contamination to groundwater from piling	**Negligible**	Implementation of recommendations from the SI and FWRA would ensure effective control and are put in place to prevent effect of piling works and excavation works.	**Negligible**
Contamination to groundwater from leaching	**Negligible**	Implementation of recommendations from the SI including segregation and containment of any contaminated soils to prevent uncontrolled release of runoff.	**Negligible**
Contamination to groundwater from new sources (spillages)	**Temporary, adverse** and of **minor significance**	Implementation of a CEMP which would stipulate the use of bunded fuel tanks in addition to contingency planning and other Site management measures.	**Negligible**
Integrity of the Fleet River Sewer and River Fleet Sewer Branch	**Negligible**	Agreement of piling techniques with Thames Water.	**Negligible**
Effect on the water quality of Fleet River Sewer and River Fleet Sewer Branch (and indirectly on the River Thames)	**Temporary, adverse and of minor significance.** **Negligible (River Thames)**	Implementation of a CEMP which would stipulate the use of bunded fuel tanks in addition to contingency planning and other Site management measures.	**Negligible**

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
Development Scenario 2			
Effects on construction workers and the general public from contaminated ground	**Negligible**	Implementation of a CEMP which would stipulate the use of PPE/RPE, health and safety planning, dust control and other site management measures.	**Negligible**
Effects on construction Workers and general public from unexploded ordnance	**Temporary**, **short-term**, **local, adverse** and of **moderate significance**	Explosive Ordnance Safety and Awareness Briefings. Shallow excavation works would be supervised by a suitably qualified unexploded ordnance engineer. An Intrusive Magnetometer Survey of all borehole and pile locations in medium risk areas would be undertaken down to a maximum bomb penetration depth.	**Negligible**
Contamination to groundwater from piling	**Negligible**	Implementation of recommendations from the SI and FWRA would ensure effective control and are put in place to prevent effect of piling works and excavation works.	**Negligible**
Contamination to groundwater from leaching	**Negligible**	Implementation of recommendations from the SI including segregation and containment of any contaminated soils to prevent uncontrolled release of runoff.	**Negligible**
Contamination to groundwater from new sources (spillages)	**Temporary, adverse** and of **minor significance**	Implementation of a CEMP which would stipulate the use of bunded fuel tanks in addition to contingency planning and other Site management measures.	**Negligible**
Integrity of the Fleet River Sewer and River Fleet Sewer Branch	**Negligible**	Agreement of piling techniques with Thames Water.	**Negligible**
Effect on the water quality of the Fleet River Sewer and River Fleet Sewer Branch (and indirectly on the River Thames)	**Temporary, adverse and of minor significance** **Negligible (River Thames)**	Implementation of a CEMP which would stipulate the use of bunded fuel tanks in addition to contingency planning and other Site management measures.	**Negligible**
Development Scenario 3			
Effects on construction workers and the general public from contaminated ground	**Negligible**	Implementation of an Environmental Management Plan which would stipulate the use of PPE/RPE, health and safety planning, dust control and other site management measures.	**Negligible**

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
Effects on construction Workers and general public from unexploded ordnance	**Temporary**, **short-term**, **local, adverse** and of **moderate significance**	Explosive Ordnance Safety and Awareness Briefings. Shallow excavation works would be supervised by a suitably qualified unexploded ordnance engineer. An Intrusive Magnetometer Survey of all borehole and pile locations in medium risk areas would be undertaken down to a maximum bomb penetration depth.	**Negligible**
Contamination to groundwater from piling	**Negligible**	Implementation of recommendations from the SI and FWRA would ensure effective control and are put in place to prevent effect of piling works and excavation works.	**Negligible**
Contamination to groundwater from leaching	**Negligible**	Implementation of recommendations from the SI including segregation and containment of any contaminated soils to prevent uncontrolled release of runoff.	**Negligible**
Contamination to groundwater from new sources (spillages)	**Temporary, adverse** and of **minor significance**	Implementation of a CEMP which would stipulate the use of bunded fuel tanks in addition to contingency planning and other Site management measures.	**Negligible**
Integrity of the Fleet River Sewer and River Fleet Sewer Branch	**Negligible**	Agreement of piling techniques with utilities provider responsible for the sewers Thames Water.	**Negligible**
Effect on the water quality of the Fleet River Sewer and River Fleet Sewer Branch (and indirectly on the River Thames)	**Temporary, adverse and of minor significance** **Negligible (River Thames)**	Implementation of a CEMP which would stipulate the use of bunded fuel tanks in addition to contingency planning and other Site management measures.	**Negligible**
Completed Development			
Development Scenario 1			
Effect of ground contamination on future occupants and visitors	**Negligible**	The findings of the SI should inform the remediation strategy which would determine how effects of contamination would be mitigated. The built development or areas of hardstanding would cover the majority of the Site; areas of soft landscaping would be capped with certified clean soil.	**Negligible**
Effect on quality of controlled waters (groundwater)	**Negligible**	Designing piling and excavations operation in accordance with Building Regulations and implementation of recommendations from the SI and FWRA would ensure effective control and are put in place to mitigate effect of piles.	**Negligible**
Effect of contamination on	**Negligible**	None required.	**Negligible**

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
underground infrastructure			
Development Scenario 2			
Effect of ground contamination on future occupants and visitors	**Negligible**	The findings of the SI should inform the remediation strategy which would determine how effects of contamination would be mitigated. The built development or areas of hardstanding would cover the majority of the Site; areas of soft landscaping would be capped with certified clean soil.	**Negligible**
Effect on quality of controlled waters (groundwater)	**Negligible**	Designing piling and excavations operation in accordance with Building Regulations and implementation of recommendations from the SI and FWRA would ensure effective control and are put in place to mitigate effect of piles.	**Negligible**
Effect of contamination on underground infrastructure	**Negligible**	None required.	**Negligible**
Development Scenario 3			
Effect of ground contamination on future occupants and visitors	**Negligible**	The findings of the SI should inform the remediation strategy which would determine how effects of contamination would be mitigated. The built development or areas of hardstanding would cover the majority of the Site; areas of soft landscaping would be capped with certified clean soil.	**Negligible**
Effect on quality of controlled waters (groundwater)	**Negligible**	Designing piling and excavations operation in accordance with Building Regulations and implementation of recommendations from the SI and FWRA would ensure effective control and are put in place to mitigate effect of piles.	**Negligible**
Effect of contamination on underground infrastructure	**Negligible**	None required.	**Negligible**

References

1 HMSO (1990) Environmental Protection Act
2 HMSO (2012) The Contaminated Land (England) (Amendment) Regulations
3 Department for Environment Food and Rural Affairs (DEFRA) (2006). DEFRA Circular 01/2006: Environmental Protection Act 1990: Part 2A, Contaminated Land.
4 HMSO (2009), The Water Resources Act 1991 (Amendment) (England and Wales) Regulations,
5 HMSO (2012), The Environmental Permitting (England and Wales) Regulations
6 HMSO (2012), Building Regulations, Approved Document C, Site Preparation and Resistance to Contaminants and Moisture
7 Department of Communities and Local Government (2012), National Planning Policy Framework
8 Greater London Authority (GLA) (2011). 'The London Plan: Spatial Development Strategy of Greater London.
9 Greater London Authority (GLA) (2012). Revised Early Minor Alterations to the London Plan, 2012
10 London Borough of Islington (LBI), (2012). London Borough of Islington's Development Management Policies Submission, 2012
11 LBI, (2012). London Borough of Islington's Site Allocations Submission, 2012
12 LBI, (2012). London Borough of Islington's Finsbury Local Plan Submission, 2012
13 LBI, (2011). London Borough of Islington's Core Strategy, 2011
14LBI, (2002). London Borough of Islington's Unitary Development Plan (Saved Policies), 2002
15 London Borough of Camden (LBC), 2012. London Borough of Camden's Site Allocations Proposed Submission Document, 2012
16 LBC, 2010. London Borough of Camden's Core Strategy, 2010-2025, 2010
17 LBC and LBI (2012) 'Mount Pleasant Supplementary Planning Document'.
18 Environment Agency, 2004, 'Model Procedures for the Management of Land Contamination - CLR 11'. Bristol.
19 LBI, London Borough of Islington Code of Practice for Construction Site
20 LBC (2008), London Borough of Camden Code of Contractors working in Camden
21 http://www.environment-agency.gov.uk/
22 Office of the Deputy Prime Minister (ODPM) 2007, Construction (Design and Management) Regulations 2007. HMSO, London.
23 Office of the Deputy Prime Minister (ODPM) (2002) Control of Substances Hazardous to Health (COSHH) Regulations 2002. HMSO, London.
24 HSE (1991), Protection of workers and the general public during the development of contaminated land
25 CIRIA (1996), Report 132, A guide for safe working on contaminated sites

14. Water Resources and Flood Risk

Introduction

14.1. This Chapter, which was written by Waterman Energy, Environment & Design (Waterman EED), presents an assessment of the likely significant effects of each of the three Development Scenarios on surface water drainage, groundwater flooding and flows, flood risk and potable water demand. Potential effects were identified and assessed for both the demolition and construction works and once the Development Scenarios are completed and operational.

14.2. This Chapter describes the planning policy context, methods used to assess the potential effects on water resources and flood risk of each Development Scenario, together with a description of the assumed future baseline conditions of the Site. The potential effects of each Development Scenario are assessed against the future baseline, and mitigation measures that are proposed to prevent, reduce or offset any potential adverse effects are identified. The Chapter concludes with an assessment of the nature and significance of likely residual effects, assuming the successful implementation of the mitigation measures where appropriate.

14.3. This Chapter is based on the findings of the Flood Risk Assessment (FRA) prepared by Waterman Transport & Development (Waterman T & D), which is presented as Appendix 14.1.

Legislation, Planning Policy and Guidance

Legislation

Water Framework Directive, 2000

14.4. The Water Framework Directive[1] applies to all European Union water bodies and aims to ensure their protection from further deterioration, and that improvements in water quality can be made. The assessment and protection of water bodies will be undertaken irrespective of political / administrative boundaries by implementing River Basin Management Plans. Although the Water Framework Directive discusses ways to mitigate the effects of flooding, it does not contain any specific flood risk management objectives. In general terms there is an onus on developers to protect and, if possible, enhance water bodies close to proposed developments.

Land Drainage Act, 1991

14.5. The Land Drainage Act[2] sets out the responsibilities given to the Environment Agency and internal drainage boards in relation to the drainage of land.

Water Resources Act 1991 (Amendment) (England and Wales) Regulation, 2009

14.6. The Water Resources Act[3] (as amended) relates to the control of the water environment. The main relevant aspects of the Water Resources Act are provisions concerning land drainage, flood mitigation and controlling discharges to watercourses to prevent water pollution. Within the Thames Region, the Water Resources Act (as amended) is complemented by the Land Drainage Byelaws[4].

Water Industry Act, 1991

14.7. The Water Industry Act[5] covers a wide range of activities required of the privatised water companies that were created in 1989. The main relevant provisions relate to trade effluent discharges to sewer for which the privatised water companies act as the regulatory authorities. Under this Act, discharge of effluent to the public sewer can only take place with the agreement or consent of the sewerage undertaker (i.e. the water company). The water companies control the nature and composition of the effluent, the maximum daily volume allowed, the maximum flow rate and the sewer into which the effluent is discharged.

Water Act, 2003

14.8. The Water Act[6] amends the Water Resources Act 1991 and the Water Industry Act 1991. The Act brings about a number of changes, including streamlining arrangements for flood defence organisation and funding, changes to the types of abstraction licences, and places a duty on water companies to conserve water and prepare for drought.

Flood and Water Management Act, 2010

14.9. The Flood and Water Management Act (2010)[7] removes the automatic right of connection into public water sewers and places the onus on the Local Planning Authorities (LPA) to adopt Sustainable Drainage Systems (SuDS). This legislation, which came into force on the 1 August 2012 through the Flood and Water Management Act 2010 (Commencement No. 7) Order 2012, provides for the comprehensive management of flood risk.

National Planning Policy

National Planning Policy Framework, 2012

14.10. The National Planning Policy Framework[8] (NPPF), which supersedes Planning Policy Statement 25: Development and Flood Risk[9] (PPS25), stipulates that "*inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere*".

14.11. The NPPF states that when determining planning applications, LPAs should ensure flood risk is not increased elsewhere and only consider development appropriate in areas at risk of flooding where it can be demonstrated that:

- Within a given site, the most vulnerable development is located in areas of lowest flood risk unless there are overriding reasons to prefer a different location; and
- Development is appropriately flood resilient and resistant, including safe access and escape routes where required, and that any residual risk can be safely managed, including by emergency planning; and it gives priority to the use of SuDS.

Regional Planning Policy

The London Plan: Spatial Development Strategy for Greater London, 2011

14.12. The London Plan[10] presents the Mayor's policies for development in London. New developments are required to meet the highest standards of sustainable design under Policy 5.3 'Sustainable Design and Construction' and include measures to reduce the effects of flooding. Policy 5.12 'Flood Risk Management' states that development proposals must comply with the requirements set out in PPS25 over the lifetime of the development, while taking into account the Thames Estuary 2100 proposals.

14.13. The London Plan identifies that the frequency and consequences of fluvial, surface water and sewer flooding are likely to increase as a result of climate change and identifies SuDS as key to ensuring that long-term flood risk is managed. Policy 5.13 'Sustainable Drainage' promotes the use of SuDS to reduce the contribution of climate change to flooding and seeks to ensure that surface water runoff is managed as close to its source as possible.

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

14.14. Policy DM39 'Flood Prevention' of the London Borough of Islington's (LBI) Development Management Policies Submission[11] states that "*Applications for major developments creating new floorspace and major Changes of Use that are likely to result in an intensification of water use are required to include details to demonstrate that Sustainable Urban Drainage Systems (SUDS) have been incorporated*". Policy DM39 'Flood Prevention' outlines several design standards that these SuDS will need to adhere to.

14.15. In addition, Policy DM40 'Sustainable and Design and Construction' states that *"Applications for major developments are required to include a Green Performance Plan (GPP) detailing measurable outputs for the occupied building, particularly for energy consumption, CO2 emissions and water use, and should set out arrangements for monitoring the progress of the plan over the first years of occupancy".*

London Borough of Islington's Site Allocations Submission, 2012

14.16. Neither surface water drainage nor flood risk is addressed in LBI's Site Allocations Submission for LBI[12].

London Borough of Islington's Finsbury Local Plan Submission, 2012

14.17. Objective 3 of LBI's Finsbury Local Plan Submission[13] intends to "*enhance the quality of the local environment, improving the health and wellbeing of residents, reducing carbon emissions and adapting to climate change*". The adaptations to climate change include addressing the increases risk of surface water flooding through the incorporation of permeable surfaces and flood storage.

London Borough of Islington's Core Strategy, 2011

14.18. The LBI's adopted Core Strategy[14] contains one policy relevant to this assessment. Policy CS10 'Sustainable Design' seeks new developments to minimise water consumption "*requiring all development to demonstrate that it meets best practice water efficiency targets and, unless it can be shown not to be feasible, incorporates rain and grey water recycling. Residential schemes will be required to achieve a water efficiency target of 95 litres/person/day or less, with non-residential schemes achieving best practice efficiency levels*". Policy CS10 also seeks new developments to be adapted to climate change, particularly through design which incorporates SuDS.

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

14.19. There are no saved policies with the LBI's Unitary Development Plan[15] that are relevant to surface water drainage or flood risk.

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

14.20. Neither flood risk nor surface water drainage is addressed in the London Borough of Camden's (LBC) Site Allocations Proposed Submission Document[16].

London Borough of Camden's Camden Core Strategy, 2010-2025, 2010

14.21. Policy CS13 'Tackling Climate Change Through Promoting Higher Environmental Standards' of LBC's adopted Core Strategy[17] states that LBC will minimise the potential for surface water flooding. This will be undertaken by ensuring that developments incorporate efficient surface and foul water infrastructure and by requiring that developments avoid harming water quality or drainage systems. Developments will also need to ensure that where issues of surface water flooding exist downstream, they are appropriately prevented or mitigated.

London Borough of Camden's Development Policies 2010-2025, 2010

14.22. LBC's Development Policies[18] contributes to the Core Strategy by setting out detailed planning policies which LBC will use to determine applications to achieve the vision of the Core Strategy.

14.23. Policy DP22: 'Promoting Sustainable Design and Construction' requires developments to incorporate green or brown roofs and green walls, wherever suitable. This policy also requires development to be resilient to the effects of climate change and incorporate such measures as limiting runoff and avoiding locating vulnerable land uses within basements in flood-prone areas.

14.24. Policy DP23: 'Water' states that LBC will require developments to reduce the pressure on the combined sewer network and the risk of flooding by:

- Limiting the rate of runoff and waste water entering the combined sewer system, using water efficient devices, rainwater harvesting and SuDS;
- Ensuring that if areas are shown to be at risk of flooding, they are appropriately designed to cope with the potential consequences; and
- Encouraging attractive and efficient water features.

14.25. Policy DP27 'Basements and Light Wells' states that such features will only be permitted where underground development would not harm the natural environment or cause flooding.

Mount Pleasant Supplementary Planning Document, 2012

14.26. LBC and LBI have adopted the Mount Pleasant Supplementary Planning Document19 (SPD) that will be used to guide development on the Site. The SPD recommends that new buildings must meet the highest standards of sustainable design and construction, including minimise surface water flood risk.

Guidance

Technical Guidance to the National Planning Policy Framework, 2012

14.27. To accompany the NPPF, additional technical guidance on flood risk has been prepared for LPA's to ensure the effective implementation of the planning policy set out in the NPPF on development in areas at risk from flooding. This technical guidance retains key elements of PPS25 as an interim measure, pending a wider review of guidance to support planning policy.

14.28. The technical guidance stipulates that developers and LPAs should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of development, and the appropriate application of SuDS.

London Borough of Islington's Environmental Design Supplementary Planning Document, 2012

14.29. LBI's adopted Environmental Design SPD[20] focuses on climate change adaptation through the use of SuDS, which are preferable to standard drainage features. The SPD recommends that major developments should incorporate SuDS to ensure that the standards of Policy DM39 'Flood Prevention' of LBI's Development Management Policies are met. The SPD also seeks new developments to measures to minimise water demand and maximise water efficiency.

London Borough of Camden's Planning Guidance 3 - Sustainability, 2011

14.30. Camden Planning Guidance 3[21] specifically aims to reduce carbon emissions and create more sustainable developments. The Guidance requires:

- All developments to prevent or mitigate against flooding;
- All developments to manage surface water drainage; and
- A hierarchy to be followed when designing SuDS.

National Standards for Sustainable Drainage Systems, 2011

14.31. The draft National Standards for Sustainable Drainage Systems[22] outlines the requirements for design, construction and operation of SuDS. As part of these requirements, the draft National Standards for Sustainable Drainage Systems sets out a hierarchy of discharging runoff from a site, as follows:

- Discharge to the ground;
- Discharge to a surface water body;
- Discharge to a surface water sewer; and
- Discharge to a combined sewer.

North London Strategic Flood Risk Assessment, 2008

14.32. The findings of the North London Strategic Flood Risk Assessment[23], which covers seven London Boroughs including LBI and LBC, seeks to provide advice to the London Boroughs and developers on how best to manage residual flood risk and surface water drainage through the implementation of SuDS.

The London Plan: Supplementary Planning Guidance, Sustainable Design and Construction, 2006

14.33. The London Plan Supplementary Planning Guidance: Sustainable Design and Construction[24] (SPG) published in May 2006, sets out two standards for the control of surface water runoff:

- Essential Standards:
  - use of SuDS, wherever practical;
  - achieve 50% attenuation of the undeveloped site's surface water runoff at peak times;
- Mayor's Preferred Standard:
  - achieve 100% attenuation of the undeveloped site's surface water runoff at peak times.

14.34. The Environment Agency's interpretation of the London Plan is that the Essential Standard requires discharge to be restricted to 50% of the existing surface water runoff rate, while the Preferred Standard requires discharge to be restricted to the Greenfield surface water runoff rate.

14.35. The SPG notes that it may not be possible to achieve the Preferred Standard in situations where a proposed development is of high density, particularly in town centres or where there are high levels of ground contamination.

Assessment Methodology and Significance Criteria

Assessment Methodology

Baseline Data Collection and Sources

14.36. The baseline conditions of the Site and surroundings were established using the following sources of information:

- Indicative flood maps published by the Environment Agency;
- Ordnance Survey (OS) maps, topographical surveys, British Geological Society (BGS) maps and borehole data, historical maps, and groundwater vulnerability maps;
- Visual inspection of the Site undertaken in October 2012, primarily to establish conditions of the Site drainage and flood defences, and to confirm the land uses;
- Drainage data and hydraulic data, and flood levels obtained from the Environment Agency;
- A Landmark EnviroCheck Report for the Site (refer to Chapter 13: *Ground Conditions and Contamination* for further details);
- A review of the findings of an intrusive geotechnical investigation on the Calthorpe Street site and Phoenix Place site, undertaken by Geotechnics Limited in 2005 (Geotechnics Limited, Report Reference PC051744);
- Consultation with LBI (no response received), LBC, Environment Agency and Thames Water to obtain records of historical flood events, surface water maps and flood levels; and
- Review of a Drainage Strategy prepared by Halcrow Yolles.

14.37. For the purposes of this assessment, it was assumed that the current flood risk and drainage regime within the Site would also be applicable and representative of the future conditions. Therefore, they form the future baseline conditions of the Site and surrounding area.

Flood Risk Assessment

14.38. A FRA (see Appendix 14.1) was undertaken by Waterman T & D, in accordance with the requirements of the NPPF and the accompanying technical guidance. The purpose of the FRA was to identify all potential sources of flooding at the Site and to determine the risk posed by these flooding sources to each Development Scenario. Both tidal and fluvial flood risks were considered, with allowances for the effects of climate change, together with the risks from groundwater, pluvial and artificial sources of flooding.

Climate Change

14.39. There is an increasing body of scientific evidence that the global climate is changing as a result of human activity. Projections of future climate change in the UK indicate that more frequent short duration, high-intensity rainfall and more frequent periods of long-duration rainfall are expected. Accordingly, the assessment of flood risk for each Development Scenario takes account of the predicted effects of climate change. The technical guidance to the NPPF suggests that for developments with a lifespan in the order of 100 years (i.e. residential), increasing peak rainfall intensity by 30% may provide an appropriate precautionary response to the uncertainty about climate change impacts. It also recommends precautionary allowances for sea level rise which suggest net annual sea level rise values up to the year 2115.

Surface Water Drainage

14.40. The London Plan and Environment Agency guidance aims for discharge to be restricted to a greater extent, as a minimum to 50% of the existing rate, and preferably to the Greenfield rate.

14.41. Consideration is also given in the FRA to surface water drainage to ensure the Development Scenarios do not increase the risk of flooding around the Site. A Drainage Strategy prepared by Halcrow Yolles sets out the existing and proposed surface water runoff rates, together with the type and volume of attenuation proposed. The Drainage Strategy was used to inform the FRA and the qualitative assessment presented in this Chapter, which was based on professional judgement.

Groundwater Flows

14.42. A qualitative assessment of the potential effects on groundwater flows associated with each Development Scenario once completed and operational was undertaken using professional judgement and experience of similar projects. Professional judgement was informed by the findings of the Preliminary Environmental Risk Assessment (PERA) (see Appendix 13.1) and the FRA.

Potable Water Demand

14.43. A qualitative assessment of the likely effects of changes in the demand on the capacity of potable water supply as a result of each Development Scenario once completed and operational was undertaken. The assessment was based on available published information from Thames Water and measures to be incorporated into each Development Scenario, including the anticipated potable water rates provided by Halcrow Yolles.

Foul Water Drainage

14.44. The foul water flow rates of each Development Scenario were calculated by Halcrow Yolles. Based on the foul water discharge rates a qualitative assessment was undertaken using professional judgement to assess the likely effects of each Development Scenario on foul water capacity.

Significance Criteria

14.45. In accordance with Chapter 2: *EIA Methodology*, the relative significance of effects on water resources and flood risk arising from each Development Scenario prior to, and after the implementation of appropriate mitigation measures, was determined. The assessment of any such potential and likely residual effects used the scale of significance presented in Table 14.1 below.

Table 14.1: Significance Criteria

Significance Criteria	Description of Criteria
Substantial beneficial	Significant local scale and moderate to significant regional scale reduction in flood risk. Major permanent reduction in demand on surface and / or foul water infrastructure. Permanent regional scale reduction in water supply demand and permanent increase in the capacity of existing infrastructure.
Moderate beneficial	Moderate scale reduction in localised flood risk. Minor permanent reduction in demand on surface and / or foul water infrastructure. Permanent local scale reduction in water supply demand and permanent increase in the capacity of existing infrastructure.
Minor beneficial	Minor local scale reduction in localised flood risk. Minor temporary local scale reduction in demand on surface and / or foul water infrastructure. Temporary local scale reduction in water supply demand and temporary increase in the capacity of existing infrastructure.
Negligible	No appreciable effecton flood risk. No appreciable effect on surface and / or foul water infrastructure. No appreciable effect on the capacity of water supply and the existing water supply infrastructure.
Minor adverse	A slight increase in the risk of flooding and minor and local scale change in groundwater flow. Increase in surface and / or foul water discharge which would require modifications to existing infrastructure. Increase in water supply which would place additional pressure on existing local supplies and existing water supply infrastructure.
Moderate adverse	Minor to moderate local scale increase in flood risk. Severe temporary flooding or change to flow characteristics of watercourses. Minor to moderate local scale change in flow of groundwater. Increase in surface and / or foul water discharge which would place undue pressure on existing infrastructure. Increase in water supply which would place undue pressure on existing local supplies and existing water supply infrastructure.
Substantial adverse	Moderate to severe increases in flood risk. Permanent flooding or change to flow characteristics of watercourses. Moderate to severe local scale change in flow of groundwater underneath the site and / or modest changes in off-site groundwater flow. Increase in surface and / or foul water discharge which would require new infrastructure. Increase in water supply which would exceed the water resource capacity of the region and therefore require new sources e.g. application of an abstraction licence. Exceed the capacity of existing infrastructure

Future Baseline Conditions

Topography

14.46 The Phoenix Place site slopes down gradient from Calthorpe Street in the north-west to Mount Pleasant in the south-east, where there is an approximate level change of between 7m and 5m north to south along Phoenix Place. Towards Calthorpe Street, the Phoenix Place site is at 19.44m Above Ordnance Datum (AOD); dropping to 13.98m AOD at the junction of Mount Pleasant with Phoenix Place.

14.47. Within the Calthorpe Street site, the delivery and service yard comprises two levels, with upper and lower level parking and loading areas connected by ramps. The upper level at the northern corner of the Calthorpe Street site (junction of Farringdon Road with Calthorpe Street) is at 18.95m AOD whilst at the southern corner of the upper level of the Calthorpe Street site adjacent to Phoenix Place is at 18.41m AOD. The lower level of the Calthorpe Street site (known as the 'Bathtub' and located in the central part of the Calthorpe Street site) is at 14.70m AOD.

Geology

14.48. The geology beneath the Site is summarised in Table 14.2 below. Further details of the underlying geology are described in the PERA and FRA included as Appendix 13.1 and Appendix 14.1 respectively.

Table 14.2: Site Geology

Stratum	Area Covered	Estimated Thickness	Typical Description
Made Ground	Phoenix Place site and Calthorpe Street site	1.3m to 9.2m (Calthorpe Street site) 1.4m to 5.2m (Phoenix Street site)	Clayey sandy gravelly material with fragments of brick and concrete
Alluvium Deposits	Beneath Phoenix Place site and the Calthorpe site.	0.8m to 2.2m	Sandy silt and clay with organic fragments
River Terrace Deposits (Hackney Gravels)	Majority of Phoenix Place site and Calthorpe Street site	3m to 12.8m	Sand gravels with rare clay
London Clay Formation	Phoenix Place site and Calthorpe Street site	4.8m to 12.6m	Silty clay
Lambeth Group	Phoenix Place site and Calthorpe Street site	12.9m to 18.4m	Mottled sandy Clay containing shell fragments
Thanet Sand Formation	Phoenix Place site and Calthorpe Street site	4.0m to 7.6m	Fine grained sand with rare clay
Upper Chalk Formation	Phoenix Place site and Calthorpe Street site	Full thickness not proved.	White Chalk with flints

Hydrogeology

14.49. The Made Ground and the London Clay Formation beneath the Site are classed as unproductive strata and therefore not considered significant for water supply or river baseflow. However, according to the Environment Agency's Aquifer Designation Map[25], the River Terrace Deposits (Hackney Gravels) and alluvium underlying the Site are classified as Secondary A Aquifers, which are capable of supporting water supplies at local rather than strategic scales. The Upper Chalk Formation; a Principal Aquifer, may support water supply and / or river base flow on a strategic scale.

14.50. Groundwater level monitoring undertaken as part of the 2005 intrusive geotechnical investigation encountered groundwater levels beneath the Calthorpe Street site between 4.02m and 47.23m (level recorded in the Upper Chalk Formation) below ground level (bgl). Beneath the Phoenix Place site, groundwater was recorded between 2.59m bgl and 9.08m bgl.

Hydrology

14.51. The River Thames is located approximately 1.5km south of the Site; Regents Canal is located approximately 1km north of the Site.

14.52. The former River Fleet flows beneath the Phoenix Place site, generally following the line of the road, Phoenix Place. The Environment Agency Flood Maps do not indicate the River Fleet as a 'main river' because it has been integrated into the local sewer network. A smaller tributary of the Fleet River passes beneath the northern part of the Calthorpe Street site, which is now known as the River Fleet Branch Sewer.

Surface Water Drainage

14.53. The Site is surrounded by a network of Thames Water combined sewers. As identified within Appendix 14.1, a Thames Water combined sewer (River Fleet Branch Sewer) extends beneath the *Bathtub* from north-east to south-west. At present, it is assumed that the drainage from the Calthorpe Street site and Phoenix Place site discharges to these public sewers; however, the exact connections are not confirmed. These would be confirmed at the detailed design stage following CCTV surveys, as recommended in the Drainage Strategy developed by Halcrow Yolles.

14.54. As identified within Appendix I of the FRA (Appendix 14.1), the surface water runoff rate for the Calthorpe Street site is estimated to be 326 litre per second (ℓ/s). The surface water runoff for the Phoenix Place site is estimated to be 143ℓ/s.

Foul Water Drainage

14.55. As identified within Chapter 3: *Existing and Future Land Uses*, the Calthorpe Street site is currently used 24-hours a day as a delivery and service yard for the adjacent Mount Pleasant Sorting Office . Similarly, the Phoenix Place site is largely used as a car park for Royal Mail staff, which is set over different levels. Considering these uses, there is likely to be no significant foul water discharge from the Site. However, the fuel station on the Calthorpe Street site is expected to have petrol inceptor drainage.

Potable Water Demand

14.56. Considering the uses on the Site, there is no potable water demand.

14.57. Thames Water is responsible for public water supply to the Site. The 'Final Water Resources Management Plan' (WRMP) published by Thames Water in February 2012[26], sets out how demand for water will be balanced against the available supply over the period from 2010 to 2035.

14.58. The geographical area that Thames Water supplies is divided into Water Resource Zones (WRZs). A WRZ is defined as an area within which all water resources can be shared and therefore customers experience the same level of service. Water resources are also planned at a WRZ level. The Site is located within the London WRZ, which is the largest WRZ (by population) within the Thames Water supply area. The deterioration in the supply demand balance in the London WRZ is expected to increase to a deficit of 10% by 2019/2020 (which is when the Entire Development is expected to be completed).

14.59. To address the supply demand deficit, the WRMP sets out a preferred programme which includes leakage reduction through mains replacement delivery of the Becton Desalination Scheme and a metering programme. In the medium to long term artificial recharge and aquifer storage and recovery schemes, small groundwater schemes and two medium-sized reuse schemes are also proposed.

Flood Risk

Tidal and Fluvial Flooding

14.60. The Environment Agency's Flood Zone Map, (Figure 3 of Appendix 14.1) shows that the Site is located within Flood Zone 1. Therefore, the Site is classed as having a low risk of tidal and fluvial flooding (less than 1 in 1,000 annual probability). Information received from the Environment Agency which can be found in Appendix C of the FRA (Appendix 14.1) confirms that the estimated 1 in 200 and 1 in 1,000 year tidal flood levels for the River Thames are 4.94m and 4.98m AOD respectively, including for the predicted effects of climate change over the lifetime of the three Development Scenarios.

Groundwater Flooding

14.61. As previously identified, the Made Ground and the London Clay Formation at the Site are classed as an unproductive stratum. The London Clay Formation acts as an aquiclude, preventing groundwater at depth (within the Principal Aquifer of the Chalk) from rising to the surface.

14.62. Historic borehole records in the vicinity of the Site indicate that groundwater has been recorded at approximately 4.2m to 9.8m bgl, which would be within the Made Ground, alluvium or River Terrace Deposits (Hackney Gravels). However, as indicated in Appendix C of the FRA (Appendix 14.1) from correspondence received from the Environment Agency and as identified within the North London SFRA Map 12 (Appendix E of the FRA), the groundwater table is likely to be 60m bgl, within the Chalk Formation. It is therefore considered that the shallow groundwater body above 60m bgl would likely comprises perched groundwater held above the impermeable London Clay Formation, and does not define the groundwater table expected within the Upper Chalk.

Pluvial / Surface Water Flooding

14.63. Pluvial flooding occurs when natural and engineered systems have insufficient capacity to deal with the volume or rate of rainfall. Pluvial flooding can sometimes occur in urban areas during an extreme, high intensity, low duration summer rainfall event, which overwhelms the local surface water drainage systems. Flood water could then be conveyed via overland flow routes dictated by the local topography.

14.64. The Environment Agency indicates no records of historic flooding from pluvial sources within the Site or in surrounding area. This has been further confirmed by LBC, the North London SFRA and the Preliminary Flood Risk Assessment for Camden (refer to Appendix 14.1). However, the Environment Agency's 'Surface Water Flood Maps' for 1 in 30 and 1 in 200 rainfall events indicate the possibility of flooding in the southern part of the Phoenix Place site where the topography is low and in the *Bathtub* of the Calthorpe Street site.

14.65. The Fleet River Sewer is located within the Phoenix Place site beneath the road, Phoenix Place (approximately 3m below the finished street level) and the Fleet River Sewer Branch extends beneath the northern part of the Calthorpe Street site in a north-east to south-west direction between Farringdon Road and Phoenix Place. The River Fleet Sewer flows south in a culvert under, discharging into the River Thames at Blackfriars Bridge over 1km from the Site. The Environment Agency flood maps do not indicate it as a 'main river' and Thames Water maps indicate that it is a main line sewer, which varies in size from approximately 3,759 x 3,582mm to 3,124 x 2,667mm. No flooding from the River Fleet Sewer is indicated within the Site.

14.66. The Environment Agency and LBC have confirmed that the Site is not within an area affected by sewer flooding events between 1997 and 2007. Thames Water has also confirmed that they have no records of operational problems with their networks in the area since 2000.

Potential Effects

Demolition and Construction

Tidal and Fluvial Flooding

Development Scenarios 1, 2 and 3

14.67. As detailed earlier in this Chapter, and within the FRA (refer to Appendix 14.1), owing to the Site's location in Flood Zone 1 and the lack of historic records of flooding, the risk of tidal and fluvial flooding in a breach event is considered to be low. This would remain the case during the demolition and construction phases of the three Development Scenarios. The potential effects of redeveloping the Site under any of the Development Scenarios from, and on tidal and fluvial flooding during demolition and construction would therefore be **negligible**.

Groundwater Flooding and Flows

Development Scenarios 1, 2 and 3

14.68. Groundwater has been recorded at approximately 4.2 to 9.8m bgl in the vicinity of the Site. However, as previously identified, the groundwater table is considered to be approximately 60m bgl.

14.69. The Calthorpe Street site *Bathtub* extends to a depth of 4.5m bgl. The *Bathtub* would be retained as part of the Calthorpe Street Development and it is proposed to be horizontally extended in the north-eastern corner of the Calthorpe Street site in addition to minimal and localised deepening beneath Building F (by less than 1m). As such, any shallow groundwater beneath the Calthorpe Street site would likely flow round the basements and would not be impeded sufficiently to cause an increase in groundwater levels or subsequent flooding to surrounding structures.

14.70. The Phoenix Place Development would include a basement, with the lowest set of the basement at a finished floor level of 8.10m AOD. As such, the proposed basement for the Phoenix Place Development would be within the River Terrace Deposits stratum. Therefore, any shallow groundwater within the Phoenix Place site would likely flow round the basements and would not be impeded sufficiently to cause an increase in groundwater levels and subsequent flooding to surrounding structures.

14.71. The deep aquifer in the Upper Chalk Formation presents no risk in respect of groundwater flooding owing to the presence of the London Clay Formation which is likely to act as an aquiclude, preventing groundwater at depth (within the Principal Aquifer of the Chalk) from rising to the surface.

14.72. The potential effect of the demolition and construction works associated the three Development Scenarios on groundwater flows is considered to be **negligible**. Shallow groundwater flows are not expected to be sufficiently impeded to cause an increase in groundwater levels that would in turn cause groundwater flooding. In addition, deep groundwater levels are prevented from rising to the surface owing to the presence of the London Clay Formation. As such, the risk of groundwater flooding for the three Development Scenarios during demolition and construction works is **negligible**.

Pluvial / Surface Water Flooding

Development Scenarios 1, 2 and 3

14.73. Demolition and construction works can give rise to changes in the surface water runoff regimes particularly during periods of heavy rainfall. The current surface of the Calthorpe Street site largely comprises tarmac and other hard-standing comprising block paving. The current surface of the Phoenix Place site comprises compacted fill material and concrete although where present the concrete surface is often in poor condition.

14.74. Considering the ground materials on the Site, it is anticipated that there would be a small temporary decrease in peak surface water runoff rates owing to the removal of existing impermeable hard-standing on the Calthorpe Street site and Phoenix Place site. However, the potential effect from the anticipated demolition and construction activities associated with the three Development Scenarios on pluvial / surface water flooding would likely be **negligible**.

Completed Development

Tidal and Fluvial Flooding

Development Scenarios 1, 2 and 3

14.75. As detailed earlier in this Chapter and within the FRA (refer to Appendix 14.1), because the Site is located in Flood Zone 1 and the lack of historic records of flooding, the risk of future flooding from tidal and fluvial events is considered to be low. Furthermore, the minimum proposed ground levels within the Phoenix Place Development and Calthorpe Street Development are 13.28m AOD and 17.50m AOD respectively, thus approximately 10m above the maximum flood level. Consequently, the potential effect of all three Development Scenarios from and on tidal and fluvial flooding would be **negligible**.

Groundwater Flooding and Flows

Development Scenarios 1, 2 and 3

14.76. The Principal Aquifer of the Chalk Formation presents no risk in respect of groundwater flooding owing to the presence of the London Clay Formation, which acts as an aquiclude, preventing groundwater in the Principal Aquifer from rising to ground level. As such, the risk posed from groundwater flooding would be in respect of perched groundwater held above the groundwater table. The *Bathtub* would be retained as part of the Calthorpe Street Development, with the lowest finished floor level of 14.55m AOD, which is expected to be within the Made Ground. The Phoenix Place Development would also include a basement, with the lowest finished floor level set at 8.10m AOD, which is expected to be within the River Terrace Deposit stratum.

14.77. It is anticipated that for both basements of the Calthorpe Street Development and the Phoenix Place Development, any shallow groundwater would be likely to flow round the basements. Consequently, groundwater flows would not be impeded sufficiently by the below ground structures to cause an increase in groundwater levels and thus the flood risk to others is considered to be low. Furthermore, the basements would be suitably waterproofed throughout the lifetime of each of the Development Scenarios. Given this, the potential effect on all three Development Scenarios on groundwater flows and flooding from the Secondary or Principal Aquifers beneath the Site would be **negligible**.

Pluvial / Surface Water Flooding

Development Scenarios 1, 2 and 3

14.78. The *Bathtub* of the Calthorpe Street Development would be decked to allow for construction above. This decking would slightly increase levels at ground floor levels at the proposed buildings, from approximately 18.60m AOD to 19.20m AOD. Owing to this slight increase in ground floor levels, there is unlikely to be a flow route into the Calthorpe Street Development from the surface or down into the proposed basement, thus preventing surface water from pooling. The southern area of the Phoenix Place site which is at risk of pluvial flooding would be raised to approximately 13.35m AOD at ground level. This is over 1m above the present level; thereby providing protection from possible surface water pooling. In addition, finished floor ground levels for Building A, would also be approximately 100mm above the level of the highway. Any pluvial flows would therefore be expected to be retained on the highway rather than entering the Phoenix Place Development.

14.79. The proposed drainage of the open spaces within the Entire Development would be designed to accommodate up to a 1 in 100 year flows and would attenuate surface water prior to discharge to the local sewer network. To provide attenuation of surface water runoff, SuDS are proposed for each of the three Development Scenarios. These comprise 400m^3 of attenuation tanks or geo-cellular storage units within the basement of the Calthorpe Street Development. Similarly, 180m^3 attenuation tanks or geo-cellular storage units would be provided in the basement of the Phoenix Place Development. These attenuation tanks or geo-cellular storage units would be supplemented by the rainwater harvesting systems, together with green and brown roofs which are proposed in each of the three Development Scenarios.

14.80. Attenuated surface water would likely be discharged via new connections to the existing sewer network. For the Calthorpe Street Development, the external drainage network would be in the form of separate surface water and foul water drainage systems that would be combined into a single system. This single system would enter the Thames Water sewerage via the combined sewers along Farringdon Street, Calthorpe Street and Phoenix Place. For the Phoenix Place Development, both surface water and foul water would be discharged into the exiting Thames Water sewerage via the combined sewers running along Phoenix Place, Mount Pleasant and Gough Street. Further details of the proposed drainage strategy are provided in the FRA (Appendix 14.1).

14.81. The drainage for the 1 in 100 year storm for both surface and foul water discharge is estimated to be 326ℓ/s and 143ℓ/s for the Calthorpe Street Development and the Phoenix Place Development respectively. In accordance with the London Plan Essential Standard, the drainage strategy proposed by Halcrow Yolles for each of the three Development Scenarios would ensure that there is a 50% reduction in the rate of surface water runoff from the Site. Consequently, with the implementation of the SuDS described above, the surface water runoff rate would be reduced to 163ℓ/s and 71/s for the 1 in 100 year storm event for the Calthorpe Street Development and Phoenix Place Development respectively. The potential effect of each of the three Development Scenarios on surface water flooding is would therefore be a **beneficial effect** of **minor significance**.

Capacity of Foul Water Sewerage

Development Scenarios 1, 2 and 3

14.82. As described above, foul water drainage from all three Development Scenarios would be discharged to the existing Thames Water sewers. Halcrow Yolles estimate that the combined surface water discharge rates for the 1 in 100 year storm event would be 326ℓ/s and 143/s for the Calthorpe Street Development and Phoenix Place Development respectively. As both foul and surface water drainage would be discharged to the existing Thames Water sewerage via a combined sewer system, to accord with the London Plan Essential Standard the combined foul water and surface water discharge would be reduced by 50%. This equates to 1 in 100 year storm event combined foul and surface water runoff discharge rates of 163ℓ/s, 71ℓ/s and 234ℓ/s for Development Scenario 2, Development Scenario 3 and Development Scenario 1 respectively. The potential effect of the each of the three Development Scenarios on foul water sewerage capacity would likely be a **negligible**.

Potable Water Demand

Development Scenarios 1, 2 and 3

14.83. Redevelopment of the Site would likely lead to an increase in demand for potable water supply of 95ℓ/person/day (requirement of the LBI), 105ℓ/person/day (requirement of Code for Sustainable Homes) and 200ℓ/person/day for the Calthorpe Street Development (Development Scenario 2), the Phoenix Place Development (Development Scenario 3) and the Entire Development (Development Scenario 1) respectively.

14.84. The Thames Water 'Water Resource Management Plan' indicates that by to 2019/2020 there is likely to be insufficient water supply in the London catchment to meet the forecast demand. To accommodate the increase in potable water demand arising from redeveloping the Site a total of 17,000ℓ, 45,000ℓ and 62,000ℓ of potable water storage is proposed for Calthorpe Street Development, Phoenix Place Development and the Entire Development respectively.

14.85. Residential uses within the Entire Development would be required to achieve a water efficiency target of 105/litres/person/day. This is intended to be achieved through the reduction, reuse and / or recycling of water through water-efficient fittings and appliances or a combination of water efficiency and greywater recycling, for which space has been allocated.

14.86. To address the insufficient water supply in the London catchment, Thames Water has prepared a detailed plan[27] which aims to ensure that sufficient supply is available to meet demand during the plan period. This involves a variety of measures including replacing Victorian water mains to reduce leakage, compulsory metering and encouraging the use of water efficiency measures. Developing new water resources would also be required and schemes planned by Thames Water comprise a number of small groundwater abstraction schemes, two aquifer recharge schemes, three aquifer storage and recovery schemes, and two water reuse schemes. As a result of these measures, water demand in London should be met until at least 2035.

14.87. By implementing the measures outlined above, the demand for potable water supply would likely be met for each Development Scenario. Consequently, the potential effect of each of the three Development Scenarios on available water supply would be **negligible**.

Mitigation Measures

Demolition and Construction

Tidal and Fluvial Flooding

Development Scenarios 1, 2 and 3

14.88. The potential effects of redeveloping the Site from and on tidal and fluvial flooding during demolition and construction would be negligible. Consequently, no mitigation measures for tidal and fluvial flooding would be required for any of the three Development Scenarios.

Groundwater Flooding and Flows

Development Scenarios 1, 2 and 3

14.89. The potential effects of redeveloping the Site on shallow and deep groundwater flooding during demolition and construction would be negligible. Consequently, no mitigation measures for groundwater flooding would be required for any of the three Development Scenarios.

Pluvial / Surface Water Flooding

Development Scenarios 1, 2 and 3

14.90. The potential effects of pluvial flooding during demolition and construction would be negligible. Consequently, no mitigation measures for pluvial flooding would be required for any of the three Development Scenarios.

Completed Development

Tidal and Fluvial Flooding

Development Scenarios 1, 2 and 3

14.91. The potential effects of the Entire Development from and on tidal and fluvial flooding would be negligible. It therefore follows that the potential effects of the Calthorpe Street Development and the Phoenix Place Development from and on tidal and fluvial flooding would also be negligible. Consequently, no mitigation measures for tidal and pluvial flooding would be required for any of the three Development Scenarios.

Groundwater Flooding and Flows

Development Scenarios 1, 2 and 3

14.92. The potential effects of the Entire Development upon groundwater flows would be negligible. It therefore follows that the potential effects of the Calthorpe Street Development and the Phoenix Place Development from groundwater flooding would also be negligible. Consequently, no mitigation measures for groundwater flooding would be required for any of the three Development Scenarios.

Pluvial / Surface Water Flooding

Development Scenario 1, 2 and 3

14.93. The SuDS and other measures built into the Entire Development would ensure that the potential effects of pluvial flooding would be **beneficial** and of **minor significance**. It therefore follows that the potential effects of the Calthorpe Street Development and the Phoenix Place Development from pluvial flooding would also be **beneficial** and of **minor significance**. Consequently, no mitigation measures for pluvial flooding would be required for any of the three Development Scenarios.

Capacity of Foul Water Sewerage

Development Scenarios 1, 2 and 3

14.94. The potential effects of the Entire Development on the capacity of foul water drainage infrastructure would be negligible. It therefore follows that the potential effects of the Calthorpe Street Development and the Phoenix Place Development on the capacity of foul water drainage infrastructure would also be negligible. Consequently, no mitigation measures for foul water drainage infrastructure would be required for any of the three Development Scenarios.

Potable Water Demand

Development Scenarios 1, 2 and 3

14.95. The demand for potable water supply would likely be met for the Entire Development through measures such as water efficient fittings and appliances. It therefore follows that the demand for potable water by the Calthorpe Street Development and the Phoenix Place Development would also be met. Consequently, no mitigation measures for potable water supply infrastructure would be required for any of the three Development Scenarios.

Likely Residual Effects

Demolition and Construction

Tidal and Fluvial Flooding

Development Scenarios 1, 2 and 3

14.96. The likely residual effect of all three Development Scenarios from and on tidal and fluvial flooding during their respective demolition and construction phases would remain as **negligible**.

Groundwater Flooding and Flows

Development Scenarios 1, 2 and 3

14.97. The likely residual effect on all three Development Scenarios from groundwater flooding during their respective demolition and construction phases would remain as **negligible**.

Pluvial / Surface Water Flooding

Development Scenarios 1, 2 and 3

14.98. The likely residual effect on all three Development Scenarios from pluvial flooding during their respective demolition and construction phases would be remain as **negligible**.

Completed Development

Tidal and Fluvial Flooding

Development Scenarios 1, 2 and 3

14.99. The likely residual effect on all three Development Scenarios once completed and operational from and on tidal and pluvial flooding would remain as **negligible**.

Groundwater Flooding and Flows

Development Scenarios 1, 2 and 3

14.100. The likely residual effect on all three Development Scenarios once completed and operational from groundwater flooding would remain as **negligible**.

Pluvial / Surface Water Flooding

Development Scenarios 1, 2 and 3

14.101. The likely residual effect on all three Development Scenarios once completed and operational from pluvial flooding would remain as **beneficial** and of **minor significance**.

Capacity of Foul Water Sewerage

Development Scenarios 1, 2 and 3

14.102. The likely residual effect on all three Development Scenarios once completed and operational on the capacity of foul water sewerage would remain as **negligible**.

Potable Water Demand

Development Scenarios 1, 2 and 3

14.103. The likely residual effect on all three Development Scenarios once completed and operational on the capacity of the potable water supply infrastructure would remain as **negligible**.

Conclusion

14.104. A summary of the potential effects, mitigation measures and likely residual effects in relation to water resources and flood risk on the three Development Scenarios is provided in Table 14.X below.

Table 14.3: Summary of the Potential Effects, Mitigation Measures and Likely Residual Effects

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
Demolition and Construction			
Development Scenarios 1, 2 and 3			
Tidal and Fluvial Flooding	**Negligible**	None required	**Negligible**
Groundwater Flooding	**Negligible**	None required	**Negligible**
Pluvial Flooding	**Negligible**	None required	**Negligible**
Completed Development			
Development Scenarios 1, 2 and 3			
Tidal and Fluvial Flooding	**Negligible**	None required	**Negligible**
Groundwater Flooding	**Negligible**	None required	**Negligible**
Pluvial Flooding	**Beneficial effect** of **minor significance**	None required	**Beneficial effect** of **minor significance**
Capacity of Foul Water Drainage	**Negligible**	None required	**Negligible**
Capacity of Potable Water Supply	**Negligible**	None required	**Negligible**

References

1 European Commission, 2000. Water Framework Directive, (2000/60/EC). OOPEC

2 Office of the Deputy Prime Minister 1991 Land Drainage Act. HMSO, Norwich

3 Office of the Deputy Prime Minister 1991 The Water Resources Act. HMSO, Norwich

4 Office of the Deputy Prime Minister 1991 The Water Resources Byelaws. HMSO, Norwich

5 Office of the Deputy Prime Minister 1991 The Water Industry Act. HMSO, Norwich.

6 Her Majesty's Stationery Office 1991 Water Industry Act, 1991.

7 Her Majesty's Stationery Office 2010 Flood and Water Management Act.

8 Department for Communities and Local Government, 2012: National Planning Policy Framework.

9 Department of Communities and Local Government 2010 Planning Policy Statement 25: Development and Flood Risk. HMSO, Norwich

10 Mayor of London 2011 The London Plan: Spatial Development Strategy for Greater London, July 2011

11 London Borough of Islington (LBI), 2012. London Borough of Islington's Development Management Policies Submission, 2012

12 LBI, 2012. London Borough of Islington's Site Allocations Submission, 2012

13 LBI, 2012. London Borough of Islington's Finsbury Local Plan Submission, 2012

14 LBI, 2011. London Borough of Islington's Core Strategy, 2011

15LBI, 2002. London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

16 London Borough of Camden (LBC), 2012. London Borough of Camden's Site Allocations Proposed Submission Document, 2012

17 London Borough of Camden, 2010. Camden Core Strategy.

18 London Borough of Camden, 2010. Camden Development Policies Pre-Adoption Version September 2010.

19 London Borough of Camden, London Borough of Islington, 2011, Mount Pleasant Draft Supplementary Planning Document, October 2011.

20 London Borough of Islington, 2012, London Borough of Islington's Environmental Design Supplementary Planning Document, 2012'

21 London Borough of Camden, 2011. Camden Planning Guidance, Sustainability, CPG3.

22 Department of Environment, Food and Rural Affairs, 2011, National Standards for sustainable drainage Systems, Designing, constructing, operating and maintaining drainage for surface runoff, December 2011.

23 Mouchel, August 2008. North London Strategic Flood Risk Assessment

24 Mayor of London, 2006, The London Plan: Supplementary Planning Guidance, Sustainable Design and Construction

25 The Environment Agency's Aquifer Designation Map (www.environment-agency.gov.uk) (accessed March 2013).

26 Thames Water, 2012 Final Water Resources Management Plan, February 2012.

27 Environment Agency, 2010 Water Resources in the South East Group: Progress towards a shared water resources strategy in the South East of England. April 2010.

15. Wind

Introduction

15.1. This Chapter, which was written by RWDI, presents an assessment of the likely significant effects of each of the three Development Scenarios on the local wind microclimate, within and immediately surrounding the Site. In particular, consideration is given to the likely significant effects of the local wind microclimate on pedestrian comfort. The assessment summarised in this Chapter is based on the findings of a full wind tunnel test and analysis undertaken by RWDI, which is presented in Appendix 15.1.

15.2. The Chapter describes the methods used to assess the likely significant effects of the local wind microclimate, the assumed future baseline conditions at the Site and around its immediate surrounds. The potential significant effects of the three Development Scenarios are presented, together with any mitigation measures required to prevent, reduce and offset any adverse effects identified. The Chapter concludes with an assessment of the nature and significance of the resulting likely residual effects.

Legislation, Planning Policy and Guidance

Legislation

15.3. There is no legislation directly relating to wind microclimate.

National Planning Policy

National Planning Policy Framework, 2012

15.4. The National Planning Policy Framework[1] (NPPF) contains no national planning policies directly relating to wind microclimate issues. However, the benefits of a high quality built environment are emphasised in the NPPF. For example, paragraph 58 states: "…*using streetscapes and buildings to create attractive and comfortable places to live, work and visit*…"

Regional Planning Policy

The London Plan: Spatial Development Strategy of Greater London, 2011

15.5. The adopted London Plan[2] places importance on the creation and maintenance of a high quality environment for London. Policy 5.3 'Sustainable Design and Construction' of the London Plan states:

"*Major development proposals should meet the minimum standards…ensuring development are comfortable and secure for users, including avoiding the creation of adverse local climatic conditions*".

15.6. Policy 7.6 'Architecture' states:

"*Building and structures should…not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate. This is particularly important for tall buildings…*"

15.7. In addition, Policy 7.7 'Location and Design of Tall and Large Buildings' states that tall buildings:

"…*should not affect their surroundings adversely in terms of microclimate, wind turbulence…*"

Revised Early Minor Alterations to the London Plan, 2012

15.8. In June 2012, the London Plan Revised Early Minor Alterations[3] was published for public consultation in order to establish consistency with the NPPF. There are no proposed changes that would affect the wind microclimate assessment.

Local Planning Policy

London Borough of Islington's Development Management Policies Submission, 2012

15.9. In paragraph 2.18 of London Borough of Islington's (LBI's) Development Management Policies Submission[4] there is mention of tall buildings and Part C of Policy DM1 in which tall buildings are defined as over 30m in height.

"…*Proposals for tall buildings must have regard to… its effect on the local environment including microclimate…*"

London Borough of Islington's Site Allocations Submission, 2012

15.10. There are no references to wind microclimate in the Site Allocations Submission[5].

London Borough of Islington's Finsbury Local Plan Submission, 2012

15.11. There are no references to wind microclimate in the Site Allocations submission[6].

London Borough of Islington's Core Strategy, 2011

15.12. The adopted Core Strategy[7] for the LBI includes the consideration of Policy CS7 'Building Scale' identifies opportunities for mixed used development along City Road (north). It states that "*major development proposals will be required to improve the public realm, provide ample private/semi-private and public open space, incorporate space for nature and must not result in detrimental microclimatic effects or overshadowing of existing residential buildings*".

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002[8]

15.13. The LBI's Unitary Development Plan[9] states in Chapter 2: Needs and Issues, Chapter 2.4: The Environment, paragraph 2.4.1, that: "…*town planning has been closely involved in many environmental concerns including: … landscaping, tree planting and the creation of open spaces; … creating a safe and accessible environment; and minimising pollution, noise and nuisance in relation to new buildings and land uses*".

15.14. In paragraphs 2.4.15 and 2.4.16

'*… Environmental Problem Areas identify wind turbulence as one of the main environmental issues in some areas of the LBI…*"

15.15. Paragraph 3.1.2 states that: "… *Wherever possible buildings should be seen in a wide context that extends beyond the functional requirements of the immediate users, to include such matters as: … Wind Turbulence…*"

Core Strategy Direction of Travel, 2009[10]

15.16. The only reference to potential wind microclimate issues is in the LBI's Core Strategy Direction of Travel[11], Policy 2 'Finsbury Park', which states that:

".. *Tall buildings must not result in detrimental microclimate effects…*"

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

15.17. There are no references to wind microclimate in the Site Allocations Submission[12].

London Borough of Camden's Core Strategy, 2010 to 2025, 2010

15.18. In paragraph 14.8 of the London Borough of Camden's (LBC) Core Strategy, 2010 to 2025[13], there is discussion about tall buildings and their potential effect on microclimate.

London Borough of Camden's Development Policies 2010 to 2025, 2010

15.19. Under DP26: 'Managing the Impact of Development on Occupiers and Neighbours of LBC's Development Policies 2010 to 2025, 2010[14], there is a statement that:

"…*The Council will protect the quality of life of occupiers and neighbours by only granting permission for development that does not cause harm to amenity. The factors we will consider include:*

(f) microclimate

15.20. and in paragraph 26.8 there is acknowledgement that

"…*Buildings can affect the flow of air and cause wind tunnels*…"

Mount Pleasant Supplementary Planning Document, 2012

15.21. In paragraph 4.2.13 of the Mount Pleasant Supplementary Planning Document[15], there is a statement that:

"…*Building heights will be assessed against a range of design issues, including:*

….Avoidance of adverse environmental effects at ground level"

Assessment Methodology and Significance Criteria

Assessment Methodology

15.22. The assessment of the likely significant effects of the likely demolition and construction works associated with each of the three Development Scenarios on the wind microclimate of the Site and the immediate surrounding area was undertaken qualitatively using wind tunnel data in conjunction with professional judgment and experience. Consideration was given to the anticipated demolition and construction activities, as outlined in Chapter 5: *Development Programme, Demolition and Construction*, together with the meteorological conditions for the Site.

15.23. Wind tunnel testing, which was undertaken for the assessment of the potential effects of each of the three Development Scenarios on the wind microclimate of the Site and immediate surrounding area, is the most well established and robust means of assessing the pedestrian wind environment. The wind tunnel tests enable the pedestrian level wind microclimate at the Site to be quantified and classified in accordance with the widely accepted Lawson Comfort Criteria. The wind tunnel tests deliver a detailed assessment of the mean and gust wind conditions around the Site and for each Development Scenario for all wind directions in terms of pedestrian comfort and strong winds.

15.24. The methodology for quantifying the pedestrian level wind environment is outlined below and full details of the assessment methodology are given in Appendix 15.1.

- Step 1: measure the building-induced wind speeds at pedestrian level in the wind tunnel;
- Step 2: adjust standard meteorological data to account for conditions at the Site;
- Step 3: combine these to obtain the expected frequency and magnitude of wind speed at pedestrian level; and
- Step 4: compare the results with the Lawson Comfort Criteria to 'grade' conditions around the Site.

15.25. The wind tunnel model included the buildings surrounding the Site and relevant features with regards to wind flow, up to a radial distance of 360m from the centre of the Site. For the purposes of this assessment, this included the changes currently be undertaken at the adjacent Mount Pleasant Sorting Office (see section on the Future Baseline conditions).

15.26. Whilst a direct comparison can be made between each of the three Development Scenarios and the assumed future baseline conditions of the Site and surrounding area, this assessment is primarily focussed on the suitability of the wind microclimate within and around each of the three Development Scenarios for the desired pedestrian uses.

15.27. Results are presented for the windiest season, which is typically representative of winter in the south of the UK (i.e. December, January, February), and summer (June, July, August). This is because some pedestrian activities defined by the Lawson Comfort Criteria need to be met during winter whereas others are dependent upon the summer conditions.

15.28. The wind tunnel tests were conducted on a model devoid of any existing and proposed trees or landscaping in order to obtain conservative results (i.e. generate a relatively windy worst-case microclimate). In general, planting and other landscaping enhancements would increase shelter within each of the three Development Scenarios compared to the future baseline wind conditions, particularly when the trees and plants are established and in full leaf.

15.29. When assessing the significance of the wind microclimate, consideration was given to sensitivity of the receptor location. Amenity spaces were assessed in terms of summer wind microclimate whereas standing areas, entrances and thoroughfares were assessed for winter because these need to 'usable' throughout the year.

15.30. For all tests, the assumed future baseline and those for the three Development Scenarios, the proposed new British Postal Museum and Archive (BPMA) building located north of the Phoenix Place site was included whereas for the cumulative assessment, the only development on the wind tunnel model considered to potentially have a localised effect on the wind microclimate (due to it's proximity to the site) was '29-39 Mount Pleasant and 5 Rosebery Avenue (planning application reference: P121605).

15.31. Conditions for the assumed future baseline along with all three Development Scenarios are not expected to change in the presence of the existing Calthorpe House.

Simulation of Atmospheric Winds

15.32. Wind is unsteady, or gusty, and this 'gustiness' or turbulence, varies depending upon the Site. Modelling these effects was achieved by a series of grid, barrier and floor roughness elements to create a boundary layer that is representative of urban or open country conditions, as is appropriate.

Measurement Technique

15.33. Wind speed measurements were made using Irwin probes, which measure the wind speed at a scaled 1.5m in height above the ground. For pedestrian comfort studies, both the mean wind speed and the peak wind speed were determined at each measurement location.

15.34. The wind speed was measured at up to 238 locations on and around the Site, and for all wind directions in equal increments, with 0° representing the wind blowing from the north and 90° for wind from the east. Probes were placed in pedestrian thoroughfares along the building facades and corners, near main entrances, within open ground level amenity spaces, and on pedestrian routes within and around each of the three Development Scenarios. Measurements were also taken at representative balconies and on the roof terraces.

Lawson Comfort Criteria

15.35. Lawson[16] devised a scale for assessing the suitability of wind conditions in the urban environment based upon threshold values of wind speed and frequency of occurrence (see Table 15.1). The Lawson Comfort Criteria define a range of pedestrian activities including sitting, standing (at bus-stops / taxi ranks), standing (outside an entrance), leisure walking (strolling), business walking and more transient activity such as crossing the road. For each activity a wind speed (in Beaufort Force – Table 15.2) and the frequency of occurrence is defined and if the wind conditions exceed the threshold then they are unacceptable for the stated activity. If the wind conditions are below the threshold then they are described as tolerable (or suitable) for the stated activity. For example in Table 15.1, if the wind speed exceeds Beaufort Force 4 (B4) for more than 4% of the time then the conditions are unacceptable for leisure walking.

Table 15.1: Lawson Comfort Criteria

Description	Level	Threshold
Roads and Car Parks	A	6% > B5
Business Walking	B	2% > B5
Pedestrian Walk-through	C	4% > B4
Pedestrian Standing	D	6% > B3
Entrance Doors	E	6% > B3
Sitting	F	1% > B3

Strong Winds

15.36. Lawson also promoted the reporting of occasional strong wind events defined by wind speeds which exceed Beaufort Force 6 (B6) for more than one hour per year. In this assessment, if the wind speed exceeds B6, B7 or B8 then mitigation may be necessary or more detailed consideration of the likely pedestrian use of an area on the windiest days of the year. If the wind speed exceeds B6 on a pedestrian thoroughfare this is unlikely to cause nuisance whereas wind speeds that exceed B7 or B8 would impede walking.

15.37. Occasional strong winds in the UK are associated with the business walking and roadway classifications defined in the Lawson Comfort Criteria. Consequently, mitigation to enhance pedestrian comfort would also reduce the strength and frequency of strong winds at these locations.

Table 15.2: Beaufort Force

Beaufort Force	Hourly Average Wind Speeds (m/s)	Description of Wind	Noticeable Wind Effect
0	< 0.45	Calm	Smoke rises Vertically
1	0.45 to 1.55	Light Air	Direction shown by smoke drift but not by vanes
2	1.55 to 3.35	Light Breeze	Wind felt on face; leaves rustle; wind vane moves
3	3.35 to 5.60	Gentle Breeze	Leaves and twigs in motion; wind extends a flag
4	5.60 to 8.25	Moderate Breeze	Raises dust and loose paper; small branches move
5	8.25 to 10.95	Fresh Breeze	Small trees, in leaf, sway
6	10.95 to 14.10	Strong Breeze	Large branches begin to move; telephone wires whistle
7	14.10 to 17.20	Near Gale	Whole trees in motion
8	17.20 to 20.80	Gale	Twigs break off, personal progress impeded
9	20.80 to 24.35	Strong Gale	Slight structural damage; chimney pots removed
10	24.35 to 28.40	Storm	Trees uprooted; considerable structural damage
11	28.40 to 32.40	Violent Storm	Damage is widespread; unusual in the UK
12	>32.40	Hurricane	Countryside is devastated; usually only occurs in tropical countries

Significance Criteria

15.38. The significance criteria used in the assessment of the potential and likely residual effects were based on the relationship between the desired pedestrian uses (as defined by the Lawson Comfort Criteria) in relation to the wind conditions predicted at a particular location with the Development in place. The following seven-point contextual scale was used within this assessment:

- **Beneficial Effect** of **Substantial Significance**: wind conditions are 3-steps calmer than desired;
- **Beneficial Effect** of **Moderate Significance**: wind conditions are 2-steps calmer than desired;
- **Beneficial Effect** of **Minor Significance**: wind conditions are 1-step calmer than desired;
- **Negligible Effect**: wind conditions are similar to those desired;
- **Adverse Effect** of **Minor Significance**: wind conditions are 1-step windier than desired;
- **Adverse Effect** of **Moderate Significance**: wind conditions are 2-steps windier than desired; and
- **Adverse Effect** of **Substantial Significance**: wind conditions are 3-steps windier than desired.

15.39. If the desired wind conditions at a particular location are required to be suitable for standing, but the expected wind conditions are identified as being suitable for leisure walking, the difference between the desired and expected wind condition is 1-step windier than desired. In this case the effect would be identified as being adverse, and of minor significance.

15.40. An adverse effect implies that the wind microclimate would be windier than desired for the intended pedestrian activity whereas a beneficial effect implies that the wind conditions are calmer than required. This is a simple, logical means of relating the measured wind microclimate to the desired pedestrian use of an area using the Lawson Comfort Criteria. As originally proposed by Lawson, strong winds are reported separately and are not incorporated into the Significance Criteria.

Future Baseline Conditions

15.41. The wind tunnel model for the assumed future baseline scenario also includes the proposed BPMA building. However, the update to the BPMA scheme is not expected to change the wind microclimate compared with the existing condition, therefore, no changes to the results of this Chapter are expected.

Meteorological Data and Anticipated Wind Conditions

15.42. The meteorological data provide a measure of the background wind climate for the London region. As such they form part of the baseline, existing wind microclimate and are described in more detail below.

General Meteorological Conditions

15.43. Meteorological data derived from the main airport meteorological stations in London (Heathrow, Stansted and Gatwick) were reviewed and combined to develop a statistical model of wind speed and direction, representative of wind conditions in London. Figure 15.1 illustrates the meteorological standard conditions of 10m above open, flat, level countryside terrain.

15.44. The meteorological data indicate that the prevailing wind direction at the Site throughout the year is from the south-west, which is typical for many areas of southern England. There is a secondary peak in winds from the north-east, especially during spring, and these tend to be cold winds. Winds from the prevailing south-westerly quadrant account for around 45% of all wind in London.

Terrain Roughness

15.45. The meteorological station data were corrected to standard conditions of 10m above open flat level country terrain. The meteorological model was then adjusted to the Site conditions; taking account of the terrain roughness using the BREVe3 software package which models the wind characteristics caused by changes in the terrain roughness at the stated reference height of 120m above the surface. The results are shown in Table 15.3.

Table 15.3:BREVe3 Mean Factors for the Site at 120m

	Direction(Degree °)											
Height	**0**	**30**	**60**	**90**	**120**	**150**	**180**	**210**	**240**	**270**	**300**	**330**
120m	1.38	1.42	1.41	1.43	1.35	1.34	1.40	1.39	1.37	1.34	1.34	1.35

15.46. The suitability of the wind microclimate likely to be experienced at the Site prior to demolition commencing was modelled for windiest season (usually winter) and summer.

15.47. As shown in Figure 15.2 and Figure 15.3, the worst-case (windiest season) and summer results for the Site predict relatively calm wind conditions, with the majority of locations suitable for sitting or standing during the windiest season. Only three locations would be suitable for leisure walking. During summer (Figure 15.3), when winds are lighter, the wind microclimate is calmer and conditions at all receptors are suitable for sitting or standing.

Strong Winds

15.48. There are no locations where the wind speed exceeds B6.

Potential Effects

Target / Desired Wind Conditions

15.49. For an urban development, the typical range of wind conditions would include sitting, standing / entrance use and leisure walking, covering the amenity spaces, taxi pick-up / drop-off / entrances and thoroughfares respectively. This range of conditions is common to many other developments in London. Business walking may be acceptable on a route where there would be limited pedestrian traffic or where alternative routes are available, because this classification would be associated with occasional strong winds during the windiest season (winter.

15.50. The desire for sitting conditions in amenity spaces, terraces and balconies is weighted towards achieving this in summer when people are more likely to use such areas. It is worth noting that achieving sitting conditions in summer usually means that the same location would become suitable for standing in winter, unless there was some additional physical shelter provided during winter to counteract the stronger winds.

15.51. As stated in the methodology, the assessment of significance is based on summer conditions in amenity areas, terraces, balconies and the windiest season at all other receptors.

Demolition and Construction

Development Scenario 1

15.52. As demolition and construction of Development Scenario 1 commences and progresses, the local wind conditions on pavements around the Site and within the Site boundary would adjust from those reported for the baseline conditions to those reported for Development Scenario 1 once completed and operational (see below). The potential effect of the demolition and construction works on the wind microclimate of the Site and immediate surrounding area would be **negligible** because the wind microclimate would be suitable for the intended pedestrian use.

Development Scenario 2

15.53. As stated for Development Scenario 1, the potential effect of the demolition and construction works on the wind microclimate of the Site and immediate surrounding area would be **negligible** because the wind microclimate would be suitable for the intended pedestrian use.

Development Scenario 3

15.54. As stated for Development Scenario 1, the potential effect of the demolition and construction works on the wind microclimate of the Site and immediate surrounding area would be **negligible** because the wind microclimate would remain suitable for the intended pedestrian use.

Completed Development

15.55. The wind tunnel model for all three Development Scenario models also includes the proposed new BPMA building. . However, the update to the BPMA scheme is not expected to change the wind microclimate compared with the existing condition, therefore, no changes to the results of this Chapter are expected.

Development Scenario 1

15.56. Figure 15.4 and Figure 15.5 show the predicted wind microclimate at ground and roof level respectively for Development Scenario 1 in terms of the Lawson Comfort Criteria for the windiest season (winter. The predicted summer wind microclimate at ground and roof level for Development Scenario 1 in terms of Lawson Comfort Criteria are shown in Figures 15.6 and 15.7 respectively.

15.57. The predicted wind microclimate across Development Scenario 1 range from sitting to leisure walking in windiest (winter), and from standing / entrance to sitting during summer.

Ground Level Entrances

15.58. In the vicinity of the proposed building entrances, the wind environment at all receptors would be suitable for standing / entrance use or sitting. Given that the proposed building entrances would be expected to have a wind microclimate suitable for the desired use (i.e. standing / entrance conditions) or better (i.e. sitting conditions) than the desired use, the potential effects would range from **negligible** to **long-term**, **local, beneficial** and of **moderate significance**.

Thoroughfares

15.59. All the pedestrian thoroughfares around and within the Development Scenario 1 site are likely to be suitable for or better than leisure walking (i.e. standing or sitting conditions) during winter. Therefore, the potential effects in terms of pedestrian comfort experienced at these thoroughfare locations would range from **negligible** to **long-term**, **local**, **beneficial** and of **moderate significance**, depending on the location.

Ground Level Amenity Spaces

15.60. Within the proposed public, private and community amenity spaces at ground level within Development Scenario 1, the predicted wind conditions are likely to be generally suitable for sitting during summer and therefore suitable for the desired use, thus representing a **negligible effect**.

Podium and Roof Terrace Level Amenity Spaces

15.61. Sitting conditions are desired during summer at the upper level amenity spaces (i.e. on the podium and roof terraces). The predicted wind microclimate at all roof level amenity locations would be suitable for sitting which implies a **negligible effect**.

Strong Winds

15.62. There are no receptors for Development Scenario 1, where the wind speed exceeds B6 for more than one hour per annum.

Development Scenario 2

15.63. Figures 15.8 and 15.9 illustrate the worst-case season results and Figures 15.10 and 15.11 present the summer results. The predicted wind microclimate of Development Scenario 2 would likely range from sitting to leisure walking in winter, and from standing to sitting during summer.

Ground Level Entrances

15.64. In the vicinity of entrances, the wind environment at all receptors is suitable for standing / entrance use or sitting. Given that the proposed building entrances would likely have a wind microclimate suitable for the desired use (i.e. standing / entrance conditions) or better (i.e. sitting conditions) than the desired use, the potential effect in relation to pedestrian comfort at proposed building entrances within Development Scenario 2 is likely to be **negligible** to **long-term**, **local**, **beneficial** and of **minor significance**, depending on the location.

Thoroughfares

15.65. All the pedestrian thoroughfares around and within Development Scenario 2 are predicted to be suitable for leisure walking, or better. Therefore all locations are likely to be suitable for thoroughfare use and thus the potential effect would range from **negligible** to **long-term**, **local**, **beneficial** and of **moderate significance**, depending on the location.

Ground Level Amenity Spaces

15.66. Within the proposed public, private and community amenity spaces at ground level within Development Scenario 2, the predicted wind conditions are likely to be suitable for sitting during summer and therefore suitable for the desired use, representing a **negligible effect**

Podium and Roof Terrace Level Amenity Spaces

15.67. Sitting conditions are desired during summer at the upper level (podium and roof terrace) amenity spaces. The predicted wind environment at all receptors tested would be suitable for sitting, which represents a **negligible effect** in terms of pedestrian comfort.

Strong Winds

15.68. There are no receptors for Development Scenario 2 where the wind speed exceeds B6 for more than one hour per annum.

Development Scenario 3

15.69. Figure 15.12 and Figure 15.13 show the predicted wind microclimate at ground and roof level respectively for Development Scenario 3 in terms of the Lawson Comfort Criteria for the windiest season (winter. The predicted summer wind microclimate at ground and roof level for Development Scenario 1 in terms of Lawson Comfort Criteria are shown in Figures 15.14 and 15.15 respectively.

15.70. The predicted wind environment across Development Scenario 3 would be suitable for a range of activities from sitting through to leisure walking in winter, and from standing to sitting during summer.

Ground Level Entrances

15.71. In the vicinity of the proposed building entrances, the predicted wind environment at all receptors would be suitable for standing / entrance use or sitting. Given that the proposed building entrances would likely have a wind microclimate suitable for the desired use (i.e. standing / entrance conditions) or better (i.e. sitting conditions) than the desired use, the potential effect in terms of pedestrian comfort is likely to be **negligible** to **long-term**, **local**, **beneficial** and of **minor significance**.

Thoroughfares

15.72. All the pedestrian thoroughfares around and within Development Scenario 3 are likely to be suitable for or better than leisure walking (i.e. standing or sitting conditions). Therefore, the predicted wind microclimate for all thoroughfares would be suitable for the intended use; thus the potential effect would be **negligible** to **long-term**, **local**, **beneficial** and of **moderate significance**.

Ground Level Amenity Spaces

15.73. Within amenity spaces, sitting conditions are desired during summer. Within the proposed public, private and community amenity spaces at ground level within Development Scenario 3, the predicted wind conditions are likely to be suitable for sitting during the summer months and therefore suitable for the desired use. All ground level amenity space proposed for Development Scenario 3 would be suitable for its intended use, representing a **negligible effect** on pedestrian comfort.

Podium and Roof Terrace Level Amenity Spaces

15.74. Sitting conditions are desired during summer at the upper level amenity spaces (i.e. on the roof terraces). The predicted wind microclimate at all roof level amenity locations would be suitable for sitting which represents a **negligible effect** in terms of pedestrian comfort.

Strong Winds

15.75. There are no locations for Development Scenario 3 where the wind speed exceeds B6 for more than one hour per annum.

Mitigation Measures

Demolition and Construction

Development Scenarios 1, 2 and 3

15.76. During demolition and construction, the local wind environment would be relatively calm and suitable for construction works and also suitable for sitting and standing around the Site during the windiest season (winter). Therefore, no mitigation measures are required during the demolition and construction works associated with each Development Scenario.

Completed Development

Development Scenario 1

15.77. For Development Scenario 1, the predicted wind environment at all receptors tested at building entrances, thoroughfares, ground and roof level amenity spaces would be suitable for their intended respective use and therefore no mitigation measures are required.

Development Scenario 2

15.78. For Development Scenario 2, the predicted wind environment at all receptors tested at building entrances, thoroughfares, ground and roof level amenity spaces would be suitable for their intended respective use and therefore no mitigation measures are required.

Development Scenario 3

15.79. For Development Scenario 3, the predicted wind environment at all receptors tested at building entrances, thoroughfares, ground and roof level amenity spaces would be suitable for their intended respective use and therefore no mitigation measures are required.

Likely Residual Effects

Demolition and Construction

Development Scenario 1

15.80. As no mitigation is required, the likely residual effect in terms of pedestrian comfort during the demolition and construction works of Development Scenario 1 would be **negligible**.

Development Scenario 2

15.81. As no mitigation is required, the likely residual effect in terms of pedestrian comfort during the demolition and construction works of Development Scenario 2 would be **negligible**.

Development Scenario 3

15.82. As no mitigation is required, the likely residual effect in terms of pedestrian comfort during the demolition and construction works of Development Scenario 3 would be **negligible**.

Completed Development

Development Scenario 1

15.83. No mitigation measures are considered necessary for Development Scenario 1 once completed and operational because the predicted wind conditions at all receptors tested at building entrances, thoroughfares, ground and roof level amenity spaces would be suitable for (or better than) the intended respective uses. Therefore, the likely residual effects for Development Scenario 1 in terms of pedestrian comfort would be **negligible** to **long-term**, **local**, **beneficial** and of **moderate significance**, depending on the location.

Development Scenario 2

15.84. No mitigation measures are considered necessary for Development Scenario 2 once completed and operational because the predicted wind conditions at all receptors tested at building entrances, thoroughfares, ground and roof level amenity spaces would be suitable for (or better than) the intended respective uses. Therefore, the likely residual effects for Development Scenario 1 in terms of pedestrian comfort would be **negligible** to **long-term**, **local, beneficial** and of **moderate significance**, depending on the location.

Development Scenario 3

15.85. No mitigation measures are considered necessary for Development Scenario 3 once completed and operational because the predicted wind conditions at all receptors tested at building entrances, thoroughfares, ground and roof level amenity spaces would be suitable for (or better than) the intended respective uses. Therefore, the likely residual effects for Development Scenario 1 in terms of pedestrian comfort would be **negligible** to **long-term**, **local**, **beneficial** and of **moderate significance**, depending on the location.

Conclusion

15.86. A wind tunnel assessment was conducted to determine the likely significant effects of each Development Scenario. The assessment used the Lawson Comfort Criteria to benchmark the wind microclimate and focused on the results for winter and summer. For the Development Scenarios once completed and operational, the predicted wind conditions would be suitable for leisure walking, standing or sitting and thus suitable for the intended uses. A summary of the potential effects in terms of pedestrian comfort, mitigation, and the nature and significance of the likely residual effects are given in Table 15.4.

Table 15.4: Summary of the Potential Wind Effects, Mitigation Measures and Likely Residual Wind Effects

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
Demolition and Construction			
Development Scenario 1			
Potential for winds to blow into the open/cleared construction Site.	**Negligible**	None required	**Negligible**
Development Scenario 2			
Potential for winds to blow into the open/cleared construction Site.	**Negligible**	None required	**Negligible**
Development Scenario 3			
Potential for winds to blow into the open/cleared construction Site.	**Negligible**	None required	**Negligible**
Completed Development			
Development Scenario 1			
Thoroughfares	**Negligible** to **long-term**, **local**, **beneficial** and of **moderate Significance**	None required	**Negligible to long-term, local, beneficial and of moderate significance**
Building Entrances	**Negligible** to **long-term, local, beneficial** and of **minor significance**	None required	**Negligible to long-term, local, beneficial** and of **minor significance**
Ground Level Amenity Space	**Negligible**	None required	**Negligible**
Upper Level Amenity Space	**Negligible**	None required	**Negligible**
Development Scenario 2			
Thoroughfares	**Negligible** to **long-term, local, beneficial** and of **moderate significance**	None required	**Negligible** to **long-term, local, beneficial** and of **moderate significance**
Building Entrances	**Negligible** to **long-term, local, beneficial** and of **minor significance**	None required	**Negligible** to **long-term, local, beneficial** and of **minor significance**
Ground Level Amenity Space	**Negligible**	None required	**Negligible**
Upper Levels Amenity Space	**Negligible**	None required	**Negligible**
Development Scenario 3			
Thoroughfares	**Negligible** to **long-term, local, beneficial** and of **moderate Significance**	None required	**Negligible** to **long-term, local, beneficial** and of **moderate significance**
Building	**Negligible** to **long-term, local, beneficial**	None required	**Negligible** to **long-term, local, beneficial**

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
Entrances	and of **minor significance**		and of **minor significance**
Ground Level Amenity Space	**Negligible**	None required	**Negligible**
Upper Level Amenity Space	**Negligible**	None required	**Negligible**

References

1 National Planning Policy Framework, 2012
2 London Plan: Spatial Development Strategy of Greater London, 2011
3 London Plan Revised Early Minor Alterations (June 2012)
4 London Borough of Islington's Development Management Policies Submission, 2012
5 London Borough of Islington's Site Allocations Submission, 2012
6London Borough of Islington's Finsbury Local Plan Submission, 2012
7 The adopted Core Strategy
8 London Borough of Islington's Unitary Development Plan (Saved Policies), 2002
9 The LBI's Unitary Development Plan
10 Core Strategy Direction of Travel, 2009
the LBI's Core Strategy Direction of Travel 11
12 London Borough of Camden's Site Allocations Proposed Submission Document, 2012
13 London Borough of Camden's Core Strategy, 2010 to 2025, 2010
14 London Borough of Camden's Development Policies 2010 to 2025, 2010
15 Mount Pleasant Supplementary Planning Document, 2012
16 'Building Aerodynamics.' Lawson T.V., Imperial College Press, April 2001.

16. Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare

Introduction

16.1. This Chapter, which was prepared by Gordon Ingram Associates (GIA), assesses the likely significant effects of each of the Development Scenarios on daylight and sunlight availability, transient and permanent overshadowing (now called hours in sun), light pollution and solar glare. The assessment has regard to the likely effect of each Development Scenario on the neighbouring residential buildings and amenity spaces surrounding the Site.

16.2. This Chapter provides a summary of relevant planning policy and a description of the methods used in the assessment. This is followed by a description of the assumed future baseline conditions of the Site and surrounding area, and an assessment of the potentially significant effects of each Development Scenario during the demolition and construction works and once the Development Scenarios are completed and operational. Mitigation measures are identified for each Development Scenario, where appropriate, to avoid, reduce or offset any adverse effects identified, together with the nature and significance of likely residual effects.

16.3. This Chapter is supplemented by the following documents which are reproduced in Appendices 16.1 to 16.5. These include information to assist the understanding of the principles underpinning this assessment and their particular application to each Development Scenario. The appendices comprise:

- Appendix 16.1 – Principles of Daylight and Sunlight and Institute of Lighting Engineers Guidelines;
- Appendix 16.2 – Drawings of Assumed Future Baseline, Development Scenarios and Cumulative Scenario;
- Appendix 16.3 – Detailed Analysis Results of the Daylight and Sunlight Amenity within the surrounding residential properties for each of the Development Scenarios;
- Appendix 16.4 – Detailed Analysis Results of the Hours in Sun Overshadowing Assessment; and
- Appendix 16.5 – Detailed Analysis Results of the Transient Overshadowing Assessments.

Legislation, Planning Policy and Guidance

National Planning Policy

National Planning Policy Framework, 2012

16.4. The NPPF[1] stipulates:

"*By encouraging good design, planning policies and decisions should limit the effect of light pollution from artificial light on local amenity…*"

Environmental Protection Act, 1990

16.5. An amendment contained within the Clean Neighbourhoods and Environment Act, 2005[2] to Section 79 of the Environmental Protection Act, 1990[3] states:

"*Artificial light emitted from premises so as to be prejudicial to health and nuisance constitutes a 'Statutory Nuisance' and it shall be the duty of every local authority to cause its area to be inspected from time to time to detect any statutory nuisances which ought to be dealt with under section 80 and, where a complaint of a statutory nuisance is made to it by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint*".

Regional Planning Policy

The London Plan: The Spatial Development Strategy for Greater London, 2012

16.6. Policy 7.6: 'Architecture' of the adopted London Plan[4], includes the following statements:

"*Buildings and structures should not cause unacceptable harm to the amenity of surrounding land and buildings… particularly residential buildings in relation to… overshadowing*";

16.7. Policy 7.7 'Location of Tall and Large Buildings' stipulates:

"*Tall and large buildings should not have an unacceptably harmful impact on their surroundings"*

"Tall buildings should not affect their surroundings adversely in terms of overshadowing, reflected glare..."

16.8. Paragraph 7.19 states:

"The lighting of the public realm also needs careful consideration to ensure places and spaces are appropriately lit, and there is an appropriate balance between issues of safety and security, and reducing light pollution."

Revised Early Minor Alterations to the London Plan, 2012

16.9. In June 2012, the Mayor published Revised Early Minor Alterations[5] to the adopted London Plan to ensure consistency with the NPPF. A number of minor alterations have been proposed to the London Plan; however these changes do not alter the policies above.

Local Planning Policy

London Borough of Islington Development Management Policies Submission, 2012

16.10. There are three policies within London Borough of Islington's (LBI's) Development Management Policies Submission Document[6] which relate to daylight, sunlight, overshadowing and light pollution, which are:

- Policy DM1 'Design' provides that in order to a development to be considered acceptable it is require to:

"*provide a good level of amenity including consideration of … overshadowing, direct sunlight and daylight…*"

16.11. Paragraph 2.13 states:

"*the design and layout of buildings must enable sufficient sunlight and daylight to penetrate into and between buildings, and ensure that adjoining land or properties are protected from unacceptable overshadowing.*"

16.12. As per paragraph 3.93:

"*when assessing the quality of private outdoor space…the shape and position and how they have regard to such matters as daylight and sunlight...*"

- Policy DM25 'Shop Fronts' provides guidance on the location of illuminated shop fronts whereby they must be located and designed in such a way so as to avoid causing visual intrusion from light pollution into adjoining or nearby residential properties.

London Borough of Islington's Site Allocations Submission, 2012

16.13. The LBI's Site Allocations Submission[7] identifies strategic locations and prioritises development for these locations including Finsbury Park which encompasses the Calthorpe Street site. However, no provisions are made in regards to daylight, sunlight and overshadowing.

London Borough of Islington's Finsbury Local Plan Submission, 2012

16.14. Whilst LBI's Finsbury Local Plan Submission[8] sets out a 15 year plan of investment for the area, it does not make any specific reference to daylight, sunlight, overshadowing, glare and light pollution.

London Borough of Islington's Unitary Development Plan (Saved Policies), 2002

16.15. A number of policies from LBI's Unitary Development Plan[9] (UDP) have been retained and 'saved' including the following that are relevant to this assessment:

- Protecting Amenity, Policy Env 16 which states that *'in considering development proposals (the council) will …minimise light pollution'*
- Site Planning, Policy D3 which provides '*new development should be designed to …safeguard the daylight and sunlight to nearby property…'*

London Borough of Islington's Core Strategy, 2011

16.16. Policy CS7 'Bunhill and Clerkenwell' of the LBI's adopted Core Strategy[10] states that major development proposals within the Mount Pleasant area will "*be required to improve the public realm….and must not result in detrimental microclimatic effects or overshadowing of existing quality public open space...*".

London Borough of Camden's Site Allocations Proposed Submission Document, 2012

16.17. Whilst London Borough of Camden's (LBC's) Site Allocations Proposed Submission Document[11] sets out strategies for specific areas within the Borough it does not make any specific policy provisions in regards to daylight, sunlight overshadowing, glare and light pollution.

London Borough of Camden's Core Strategy, 2010-2025, 2010

16.18. According to the LBC's adopted Core Strategy[12], Policy CS5 'Managing the Effect of Growth and Development':

"*The Council will protect the amenity of Camden's residents and those working in and visiting the borough by...*

e) making sure that the effect of developments on their occupiers and neighbours is fully considered...

g) requiring mitigation measures where necessary."

16.19. Paragraph 15.29 of LBC's Core Strategy[13] states that:

"*the Council will therefore prevent the loss and degradation of habitat including from overshadowing and lighting in especially sensitive areas.*"

London Borough of Camden Development Policies 2010-2025, 2010

16.20. Policy DP26 'Managing the Effect of Development on Occupiers and Neighbours' of the LBC's Development Policies[14] states that the: "*council will protect the quality of life of occupiers and neighbours by only granting permission for development that does not cause harm to amenity*". A number of factors will be considered by LBC including the following:

"*…b) Overshadowing and outlook;*

c) sunlight, daylight and artificial light levels ..."

16.21. According to paragraph 26.2:

"*development should avoid harmful effects on the amenity of existing and future occupiers and to nearby properties.*"

16.22. Paragraph 26.4 discusses light pollution and in particular states:

"*Lighting can increase the potential for natural surveillance and, where used correctly, can reduce the opportunity for criminal activity and increase the likelihood of it being challenged and / or reported. However, poorly designed internal and external lighting or lighting that operates for an excessive period of time is a form of pollution that can harm the quality of life for those living nearby, affect wildlife and waste energy. Camden's dense character means that light pollution can be a bigger problem in the borough than in lower density areas where uses are not so close together. For example, lighting from conservatories can affect neighbours living above, as well as to the sides and rear, and the lighting of advertisements can affect people living nearby. Glare and light spillage from poorly designed lighting can make it less easy to see things at night and effect wildlife as well as people. Lighting should only illuminate the intended area and not affect or effect on its surroundings.*"

Mount Pleasant Supplementary Planning Document, 2012

16.23. Paragraph 4.2.13 of the Mount Pleasant SPD[15] states:

"*Building heights will be assessed against a range of design issues, including….the potential for unacceptable overshadowing, loss of privacy to habitable rooms and loss of direct sunlight and daylight.*"

Guidance

Islington Urban Design Guide, 2006

16.24. Policy D3 of the Islington Urban Design Guide[16] states:

"*The layout of buildings and spaces on a development site should be logically and efficiently planned to ensure that access, functional, amenity and aesthetic requirements are met. In particular, new development should be designed to…safeguard the daylight and sunlight to nearby property…*" and "*... provide adequate open space, and satisfactory aspect, daylight and sunlight to all parts of the development within the site*".

Building Research Establishment Guidelines: Site Layout Planning for Daylight and Sunlight 2011, A Guide to Good Practice, Second Edition

16.25. The Building Research Establishment (BRE) Guidelines 'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice 2011, 2nd edition' (released October 2011)[17] provides advice on site layout planning to achieve good sunlighting and daylighting within buildings, and in the open spaces between them. It is intended for building designers, developers, consultants and Local Planning Authorities (LPAs). The advice it gives is not mandatory and should not be used as an instrument of planning policy. Of particular relevance, it states:

"*This guide is a comprehensive revision of the 1991 edition of Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice. It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location.*"

16.26. And:

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

16.27. The methodology for the assessment of daylight, sunlight, and overshadowing is set out in the BRE Guidelines and is summarised below.

Institute of Lighting Engineers 'Guidance Notes for the Reduction of Obtrusive Light', 2005

16.28. The Institute of Lighting Engineers (ILE) Guidance Notes (ILE, 2000)[18] quantify the levels of sky glow, glare and light trespass considered acceptable for varying environmental zones. Further detail is provided in Appendix 16.1.

Assessment Methodology and Significance Criteria

Assessment Methodology

16.29. The analyses carried out for this assessment were undertaken by creating a digital three-dimensional model of the Site and its surroundings (taking account the alterations to the Mount Pleasant Sorting Office), based on measured survey data and the permitted alterations to the Mount Pleasant Sorting Office. Actual room layouts of the surrounding residential properties were obtained, where possible. This enables precise evaluation of the diffuse levels of daylight within each of the rooms via the No Sky Line (NSL) and Average Daylight Factor (ADF) methodologies, which are discussed in more detail below. Where room layout information was unavailable, assumptions were made in regards to the likely use and internal configuration of the rooms behind the fenestration observed. In such cases a standard 4.2m (14ft) room depth was assumed, unless the building form dictated otherwise. This is common practice where access for surveying is unavailable. The uses of adjoining properties, in terms of commercial and residential, were established using external observations and Valuation Office Agency (VOA) checks.

16.30. The computer models of the Site, surrounding buildings and each Development Scenario were correctly orientated north by the use of Ordnance Survey (OS) information so as to enable the path of the sun to be tracked throughout the year, where relevant. Only those surrounding properties which have windows facing towards the Site were included for assessment. If a nearby property has no windows facing the Site, these properties would not be affected by any of the Development Scenarios in terms of light.

16.31. The daylight, sunlight and overshadowing assessment presented within this Chapter considers the likely effects on sensitive (residential) receptors surrounding the Site. It was agreed with LBI and LBC (see Appendix 2.3) that the assessment of daylight, sunlight and overshadowing within each of the Development Scenarios would be assessed separately, with the findings presented in a standalone document accompanying each planning application.

16.32. The BRE Guidelines suggests that the most sensitive receptors for daylight and sunlight effects are residential properties. Therefore, this Chapter focuses on the residential properties adjacent to the Site, which includes:

- 1-16 Charles Simmons House;
- 160&162 Farringdon Road;
- Margery Street;
- Sherston Court;
- 4-15 Attneave Street;
- 114-140 Farringdon Road (even only);
- 142-146 Farringdon Road;
- 96-106 Farringdon Road (even only);
- 43 Rosebery Avenue;
- 11-27 Mount Pleasant (odd only);
- 1 Rosebery Court;
- 45 Mount Pleasant (The Apple Tree);
- 51-53 Mount Pleasant;
- 55 Mount Pleasant;
- 57 Mount Pleasant;
- 1-2 Mews House;
- 1-51 Rosebery Square;
- 1-30 Laystall Court;
- 37-48 Elm Street;
- Mullen Tower;
- 1-26 Churston Mansions;
- 20-50 Calthorpe Street (even only);
- 23-43 Calthorpe Street (odd only);
- 1-3 Pakenham Street;
- 45-49 Calthorpe Street (odd only); and
- Union Tavern.

Future Baseline Conditions

16.33. The assumed future baseline conditions are those that are predicted to pertain in and around the Site when the modernisation of the adjacent Mount Pleasant Sorting Office (including changes to the roof top plant) are completed, which is likely to be the end of 2013, and prior to the demolition and construction works (including the Enabling Works associated with the Calthorpe Street Development) commencing for any of the three Development Scenarios. Consequently, this Chapter considers the assumed 'future' baseline conditions of the Site and surrounding area, whereby it is assumed that intensification of operations at the adjacent Mount Pleasant Sorting Office is complete and operational.

16.34. Given that the modernisation of the Mount Pleasant Sorting Office will be completed prior to any new development on the Site, the assessment reported in this Chapter is based on a future baseline which includes the modernisation works as shown on drawings 4559/72 to 4559/74 (Appendix 16.2).

Development Scenarios

16.35. Two planning applications for the Site have been submitted to LBI and LBC for determination as appropriate. Accordingly, modelling was undertaken for the following 'Development Scenarios':

- Development Scenario 1 (drawings 4559/116 to 4559/118 within Appendix 16.2): The Entire Development (i.e. Calthorpe Street Development (including the Enabling Works) and Phoenix Place Development;
- Development Scenario 2 (drawing 4559/125 Appendix 16.2): Calthorpe Street Development (including the Enabling Works); and
- Development Scenario 3 (drawing 4559/124 Appendix 16.2): Phoenix Place Development.

16.36. Development Scenario 1 has also been modelled with the cumulative schemes (see Chapter 17: Cumulative Effects) and assessed under the cumulative scenario as shown on drawings 4559/126 and 4559/130-131. In regards to Development Scenario 2 and Development Scenario 3, a qualitative review of the potential effects has been provided rather than the undertaking of a full technical analysis.

Daylight

16.37. The BRE Guidelines provide two main methods for assessing daylight within existing residential units:

- Vertical Sky Component (VSC); and
- NSL.

16.38. A third method of assessment, the ADF, is provided for new developments. Each method is described in more detail below:

Vertical Sky Component

16.39. The VSC method of assessment measures the amount of light available on a vertical wall or window following the introduction of visible barriers, such as buildings. The 'standard overcast sky' is used and the level of light is expressed as a percentage. The maximum VSC value is almost 40% for a completely unobstructed vertical wall or window.

No Sky Line

16.40. The NSL method is a measure of the distribution of daylight at the 'working plane' within a room. For the NSL assessment the 'working plane' means a horizontal 'desktop', plan 0.85m in height. The NSL divided those areas of the working plane which can receive direct sky light from those which cannot. It is important to indicate how good the distribution of daylight is in a room. Areas beyond the NSL will generally look gloomy and supplementary electric lighting may be required.

Average Daylight Factor

16.41. The ADF is defined as "*a ratio of total daylight flux incident on a reference area to the total area of the* reference *area, expressed as a percentage of outdoor illuminance on a horizontal plane, due to an unobstructed sky of assumed or known illuminance distribution*.

16.42. This daylight assessment methods considers the diffuse visible transmittance of the glazing to the room in question (i.e. how much light gets through the window glass); the net glazed area of the window in question; the total area of the room surfaces (ceiling, walls, floor and windows); and the angle of visible sky reaching the window / windows in question. It also makes allowance for the average reflectance of the internal surfaces of the room and of external obstruction. The BRE Guidelines and British Standard BS820619 recommend that for a fairly light-coloured room an internal reflectance value of 0.5 can be assumed.

16.43. The recommended ADF value is dependent on the use of the room in question. The BRE Guidelines suggest a bedroom should have an ADF of 1%, a living room 1.5% and a kitchen 2%. If a given room meets its relevant criterion, then it will be regarded as having adequate daylight.

16.44. The BRE Guidelines provide that this method of assessment for daylight is applied for new developments rather than existing neighbouring buildings, unless the internal subdivision of the properties is known; whereby the ADF may be used to inform the light potential.

Sunlight

Annual Probable Sunlight Hours

16.45. The BRE Guidelines note that:

"*In housing, the main requirement for sunlight is in living rooms, where it is valued at any time of day, but especially in the afternoon.*"

"*…a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day*".

"*If a window point can receive at least one quarter of APSH, including at least 5% of APSH in the winter months between 21 September and 21 March, then the room should still receive enough sunlight.*"

16.46. For existing residential buildings, the BRE Guidelines suggest that:

"*all main living rooms of dwellings…should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun*"; and

"*If the main living room to a dwelling has a main window facing within 90° of due north, but a secondary window facing within 90° of due south, sunlight to the secondary window should be checked.*"

16.47. The assessment of existing buildings was taken at the centre of the window on the outside window face and the APSH is expressed as a percentage.

Hours in Sun

16.48. The method for assessing hours in sun is the 'sun-on-ground indicator'. The hours in sun assessment applies both to new and existing gardens / amenity areas, which are affected by new developments. The BRE Guidelines suggest that the Spring Equinox (March 21) is a suitable date for the assessment. Using specialist software, the path of the sun is tracked to determine where the sun would reach the ground and where it would not. This assessment reviews the total percentage of an area in direct sunlight on the March 21.

Transient Overshadowing

16.49. The BRE Guidelines suggest that where large buildings are proposed, it is useful and illustrative to plot a shadow plan to show the location of shadows at different times of the day and year. For the purpose of this assessment, the transient shadow was mapped for the following three key dates in the year and presented in Appendix 16.5.

- March 21 (Spring Equinox);
- June 21 (Summer Solstice); and
- December 21 (Winter Solstice).

16.50. For each of these dates, the transient overshadowing is calculated at hourly intervals throughout the day from 08:00 to 19:00. Some images are not included within Appendix 16.5 as the sun would not be present during these times (e.g. from approximately 16:00 onwards on December 21); therefore no shadow can be cast.

16.51. September 21 (Autumn Equinox) provides the same overshadowing images as March 21 (Spring Equinox) as the sun follows the same path at these corresponding times of year. Thus only the March illustrations are included and illustrate the path of the shadow on both key dates.

16.52. The indicators are calculated for different latitudes, London being at 51.5° north. Southern orientation is critically important, as are the heights of the buildings within the Development Scenarios and existing buildings.

16.53. The basis of the transient overshadowing assessment only considers those amenity areas which experience an alteration and are located close to the Site. The effects to both the defined internal and external amenity areas are captured in more detail within the two other overshadowing assessments.

Light Pollution

16.54. Light pollution is defined as any light emitting from artificial sources into spaces where it is unwanted, such as spillage of light from office or commercial buildings onto streets, or, into residential accommodation, such as bedrooms, where this would cause nuisance to the occupants. The ILE Guidance Notes provide measurable lighting level values to ascertain the acceptability of lighting levels at night. LPAs often have regard to the values contained in the ILE Guidance Notes in assessment of the potential lighting effects of proposed developments. A copy of the ILE Guidance Notes is provided in Appendix 16.1.

16.55. It should be noted that light pollution is not always perceived as a bad thing, particularly in areas of high crime where good street lighting and light into street environments is seen as a positive attribute. The only adverse effects caused as a result of electric lighting is the intrusion of light into adjacent residential accommodation at night, intrusion into areas of special night-time interest or needless spillage into the night sky.

16.56. Table 16.1 below is taken from the ILE Guidance Notes (refer to Appendix 16.1). It quantifies acceptable levels of light spillage and source intensity for differing geographical areas, ranging from naturally dark areas to city centres.

.

Table 16.1: ILE Light Pollution Criteria

Environmental Zone	Sky Glow ULR [Max %](1)	Light Trespass (into windows) E_v [lux](2)		Source Intensity I (kcd)(3)		Building Luminance Pre-Curfew (4)
		Pre-Curfew	Post-Curfew	Pre-Curfew	Post-Curfew	Average, L (cd/m2)
E1 – Intrinsically dark areas (e.g. National Parks, areas of outstanding natural beauty)	0	2	1 *	2.5	0	0
E2 – Low district brightness (e.g. rural or small village locations)	2.5	5	1	7.5	0.5	5
E3 – Medium district brightness (e.g. small town centres or urban locations)	5	10	2	10	1.0	10
E4 – High district brightness (e.g. town/city centres with high levels of night time activity)	15	25	5	25	2.5	25

Notes: 1 – E_V = Vertical Illuminance in Lux normal to glazing. 2 – Light Intensity in kilo-candelas (kcd). 3 – Acceptable from public road lighting installations only. Cd (candelas) = one candela is the luminous intensity, in a given direction, of a source that emits monochromatic radiation of frequency 540 × 10^{12}Hz and has a radiant intensity in that direction of $^{1}/_{683}$ watt per steradian.

16.57. With reference to Table 16.1, the Site is classified as environmental zone E4. This zone allows for a maximum pre-curfew light trespass level of 25 lux and a maximum post-curfew light trespass level of 5 lux. A maximum of 15% Upward Light Ratio (ULR) is permissible for the assessment of Sky Glow and an average of 25 candelas per square metre (cd/m^2) is permissible for building luminance within this zone. With regards to Source Intensity, a maximum of 25kcd pre-curfew and 2.5kcd post-curfew is permissible within this zone.

16.58. Light levels drop with a distance from the source and beyond a set distance (20 metres) the light pollution effects become negligible and therefore need not be considered. In addition, given that high powered lighting is typically used within commercial office spaces as opposed to residential the analysis focuses on potential light spill from office space.

16.59. None of the residential properties adjacent to the Site are located within 20m of the proposed offices (see Figure 16.1). Therefore, any potential light trespass as a result of the Development Scenarios would be negligible. In addition, any future external lighting would be designed in accordance with ILE recommendations. As such, it was not considered necessary to include a quantitative assessment of light pollution in regards to the Development Scenarios and it is not considered further in this Chapter.

Solar Glare

16.60. On page 28 of the BRE Guidelines, the following statement is made regarding the potential for reflected solar glare on a proposed development:

"*Glare or solar dazzle can occur when sunlight is reflected from a glazed façade. This can affect road users outside and the occupants of adjoining buildings. The problem can occur either when there are large areas of reflective glass or cladding on the façade, or when there are areas of glass or cladding which slope back so that high altitude sunlight can be reflected along the ground. Thus solar dazzle is only a long term problem only for some heavily glazed (or mirror clad) buildings…*"

16.61. Solar glare is particularly important at pedestrian and vehicular junctions, where glare can cause temporary blinding of drivers or pedestrians. It can be significant when it emanates from a predominantly glazed façade.

16.62. As the elevations of the three Development Scenarios would not be predominantly glazed, but rather consist of punched windows within a solid façade, any instances of solar glare would occur only for a very short time and can therefore be considered as negligible. As such, it was not considered necessary to include a quantitative assessment of solar glare and it is not considered further in this Chapter.

Significance Criteria

Daylight and Sunlight

16.63. The results of the daylight and sunlight assessment are compared against the criteria set out in the BRE Guidelines and as summarised in Table 16.2.

Table 16.2: BRE Guidelines Criteria for Daylight and Sunlight

Issue	BRE Guidelines Criteria
VSC	A window may be adversely affected if its VSC measured at the centre of the window is less than 27% and less than 0.8 times is former value.
NSL	A room may be adversely affected if the daylight distribution (NSL) is reduced beyond 0.8 times its existing area.
APSH	A window may be adversely affected if a point at the centre of the window received for the whole year, less than 25% of the APSH including at least 5% of the APSH during the winter months (September 21 to March 21) and less than 0.8 times its former sunlight hours during either period, and for existing neighbouring buildings, if there is a reduction in total APSH which is greater than 4%.

16.64. Appendix I of the BRE Guidelines addresses EIAs with regard to daylight and sunlight. Section 3 states:

"*Adverse effects occur when there is a significant decrease in the amount of skylight and sunlight reaching an existing building where it is required, or in the amount of sunlight reaching an open space … The assessment of effect will depend on a combination of factors, and there is no simple rule of thumb that can be applied.*"

16.65. Paragraph 5 of Appendix I goes on to say that:

"*Where the loss of skylight or sunlight fully meets the guidelines in this book, the effect is assessed as negligible or minor adverse. Where the loss of light is well within the guidelines, or only a small number of windows or limited area of open space lose light (within the guidelines), a classification of negligible effect is more appropriate. Where the loss of light is only just within the guidelines and a larger number of windows or open space are affected, a minor adverse effect would be more appropriate, especially if there is a particularly strong requirement for daylight and sunlight in the affected building or open space*."

16.66. Paragraph 6 of Appendix I continues:

"*Where the loss of skylight or sunlight does not meet the guidelines in this book, the effect is assessed as minor, moderate or major adverse. Factors tending towards a minor adverse effect include:*

- *Only a small number of windows or limited area of open space are affected;*
- *The loss of light is only marginally outside the guidelines;*
- *An affected room has other sources of skylight or sunlight; and*
- *The affected building or open space only has a low level of requirement for skylight or sunlight."*

16.67. The classification of **substantial adverse** is documented within Paragraph 7 of the Appendix I as:

"*Factors tending towards a major adverse effect include:*

- *a large number of windows or large area of open space are affected;*
- *the loss of light is substantially outside the guidelines;*
- *all the windows in a particular property are affected; and*
- *the affected indoor or outdoor spaces have a particular strong requirement for skylight or sunlight, e.g. A living room in a dwelling or a children's playground*".

16.68. Beneficial effects occur when there is a significant increase in the amount of skylight and sunlight reaching an existing building where it is required, or an increase in the amount of sunlight reaching an existing open space. Beneficial effects should be assessed using the same principles as adverse effects. Thus a small increase in light would be classified as a **negligible effect**, not a **minor beneficial effect**.

16.69. Professional judgement was used to establish whether a potential effect to each of the rooms / windows assessed would be **beneficial** or **adverse**, and of either **minor**, **moderate** or **substantial significance**.

16.70. The BRE Guidelines should be interpreted flexibly and should not be used as an instrument of planning policy. The BRE Guidelines do not provide mandatory rules but guidelines intended to help the designer and planning authority, and should be viewed in the context of other site constraints.

16.71. In view of the above, the interpretation of the daylight and sunlight results was considered in terms of the quantum of light lost and retained, not purely on the percentage of change. The percentage value may well be misleading, particularly where the baseline values are small. In these situations, a small change in the quantum of light could represent a high percentage change in the overall figure, implying that there would be a significant change in daylight and sunlight whereas in reality the difference would be negligible. In addition, the BRE Guidelines criterion does not specifically relate to city centre locations; thus a degree of flexibility needs to be applied when assessing the significance of daylight and sunlight effects in urban locations.

16.72. Throughout this Chapter, it should be noted that all potential effects and likely residual effects are referred to as **minor**, **moderate** or **substantial**, using professional judgement, and by reference to the criteria summarised within Table 16.2.

16.73. Effects considered **minor** are those which are slight and are localised effects of no significance.

16.74. Where effects are considered **moderate** adverse, these are limited effects which may be considered significant.

16.75. Effects considered **substantial** in significance are those which are considerable and of more than local significance or in breach of recognised acceptability, legislation, policy or standards.

16.76. Where the results show compliance with the BRE Guidelines criteria, the effect is considered **negligible** because the BRE Guidelines indicate that the occupants are unlikely to experience any noticeable change to their amenity levels.

Hours in Sun (BRE Guidelines)

16.77. The BRE Guidelines suggest that for a garden or amenity area to appear adequately sunlit throughout the year, no more than half (50%) of the area should be prevented by buildings from receiving two hours of sunlight on the March 21. The BRE Guidelines go on to suggest that if, as a result of a new development, an existing garden or amenity area does not meet the guidance, or the area which can receive some sun on the March 21 is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.

16.78. Where an amenity area does not meet the criteria suggested within the BRE Guidelines, the effects are identified as **beneficial** or **adverse** and of **minor**, **moderate** or **substantial** significance based on professional judgement. Where there is compliance with the BRE Guidelines the effect is considered to be **negligible**.

Transient Overshadowing

16.79. The BRE Guidelines give no criteria for the significance of transitory overshadowing, other than to suggest that by establishing the different times of day and year when shadow would be cast over adjacent areas, an indication is given as to the significance of the effect of the development. The assessment of transient overshadowing is therefore based on professional judgement; taking into consideration the effect of the future baseline conditions of the Site and comparing it with the likely transient overshadowing effect of the three Development Scenarios.

16.80. The results in Appendix 16.5 illustrate the shadows cast by the existing buildings adjacent to the Site in grey; the shadows cast by the existing Site buildings in green; and the shadows cast by each of the three Development Scenarios in purple.

16.81. Where changes are predicted the transient overshadowing is defined as being **beneficial** or adverse and of **minor**, **moderate** or **substantial significance** based on professional judgement and the assessment results. Where no changes are predicted the potential effect is considered to be **negligible**.

Future Baseline Conditions

Daylight and Sunlight

16.82. Full detailed results of the assumed future baseline conditions are provided in Appendix 16.3 and summarised in Table 16.3 below.

Table 16.3: Summary of the Future Baseline Daylight and Sunlight Results

Address	Total No. of Windows that Meet VSC Criterion (>27%)	Total No. of Rooms that receive NSL in excess of 50%	Total No. of Windows that Meet APSH Criterion
1-16 Charles Simmons House	20 of 28 (71%)	28 of 28 (100%)	25 of 28 (89%)
160 & 162 Farringdon Road	23 of 23 (100%)	13 of 13 (100%)	17 of 19 (89%)
Margery Court	6 of 10 (60%)	10 of 10 (100%)	-
Sherston Court	40 of 43 (93%)	36 of 36 (100%)	43 of 43 (100%)
4-15 Attneave Street	17 of 22 (77%)	15 of 17 (88%)	5 of 7 (71%)
114-140 Farringdon Street (even)	87 of 153 (57%)	82 of 83 (99%)	138 of 153 (90%)
142-146 Farringdon Street	24 of 24 (100%)	24 of 24 (100%)	24 of 24 (100%)
96-106 Farringdon Street (even)	51 of 67 (76%)	26 of 26 (100%)	59 of 59 (100%)
43 Rosebery Avenue	13 of 20 (65%)	5 of 5 (100%)	2 of 20 (10%)
11-23 Mount Pleasant (odd)	48 of 95 (47%)	46 of 53 (87%)	-
1 Rosebery Court	15 of 38 (39%)	28 of 38 (74%)	-
45 Mount Pleasant	8 of 12 (67%)	4 of 4 (100%)	-
51-53 Mount Pleasant	19 of 26 (73%)	8 of 10 (80%)	-
55 Mount Pleasant	8 of 10 (80%)	3 of 4 (75%)	-
57 Mount Pleasant	8 of 10 (80%)	3 of 4 (75%)	-
1-2 Mews House	2 of 13 (15%)	2 of 6 (33%)	1 of 9 (11%)
1-51 Rosebery Square	42 of 104 (40%)	80 of 84 (95%)	11 of 20 (55%)
1-30 Laystall Court	68 of 70 (97%)	70 of 70 (100%)	-
37-48 Elm Street	38 of 120 (32%)	76 of 84 (90%)	0 of 12 (0%)
Mullen Tower	4 of 22 (18%)	22 of 22 (100%)	-
1-26 Churston Mansions	1 of 51 (2%)	26 of 32 (81%)	1 of 12 (8%)
20-50 Calthorpe Street (even)	80 of 113 (71%)	99 of 100 (99%)	79 of 97 (81%)
23-43 Calthorpe Street (odd)	47 of 80 (59%)	38 of 46 (83%)	61 of 80 (76%)
1-3 Pakenham Street	29 of 32 (91%)	15 of 15 (100%)	12 of 12 (100%)
45-49 Calthorpe Street (odd)	15 of 18 (83%)	12 of 12 (100%)	15 of 18 (83%)
Union Tavern	13 of 23 (57%)	5 of 10 (50%)	23 of 23 (100%)
Total	726 of 1227 (59%)	776 of 836 (93%)	516 of 636 (81%)

16.83. The results in Table 16.3 demonstrate that in respect of the assumed future baseline conditions the levels of daylight (by reference to the NSL) would be relatively high within the surrounding residential buildings, with 93% of the rooms achieving a daylight distribution greater than 50% of the total room area. In regards to the VSL method of assessment, the results indicate a lower level of BRE Guidelines compliance, with only 726 (59%) out of the 1,227 windows receiving a VSC of 27% or more.

16.84. There are two residential properties which have existing marginalised levels of daylight by reference to both VSC and NSL methods of assessment: these are 1-2 Mews House and the Union Tavern. This is likely a result of existing high local obstruction and in such circumstances any increase in massing on the neighbouring properties would result in a disproportionate alteration in daylight.

16.85. In regards to sunlight, only those windows which face the Site and are located within 90° of due south were considered (as per the BRE Guidelines). The results of the future baseline assessment indicate that 516 (81%) out of the 636 windows assessed would receive a total APSH of 25% under future baseline conditions, with at least 5% in the winter period.

Hours in Sun

16.86. There are a number of amenity areas surrounding the Site; the majority are back gardens serving the residential dwellings along Farringdon Road and Calthorpe Street. The location of these areas is indicated on Figure 16.2 and labelled Areas A to I. Full details of the results are provided in Appendix 16.4 which are summarised in Table 16.4 below.

Table 16.4: Summary of Future Baseline Hours in Sun Results

Amenity Area (see Figure 16.2)	Proportion which receives at least 2 hours of sun on March 21
A (rear gardens of 1-10 Wren Street)	89.8%
B (rear gardens of 1-21 Calthorpe Street)	10.9%
C (rear gardens of 12-20 Wren Street)	94.8%
D (rear gardens of 23-43 Calthorpe Street)	68%
E (forecourt of 45-49 Calthorpe Street)	99.7%
F (rear gardens of 2-24 Calthorpe Street)	55.2%
G (rear gardens of 26-50 Calthorpe Street)	93.7%
H (rear gardens of Farringdon Road properties)	35.3%
I (Rosebery Avenue public square)	98.1%

16.87. According to the results of the future baseline conditions, of the nine amenity areas identified, seven would receive two hours or more of direct sun to at least 50% of the amenity area and therefore would meet the criterion recommended in the BRE Guidelines.

16.88. Area B (rear gardens of 1-21 Calthorpe Street) would receive two hours of sun to only 10.9% of its total area whereas 35.3% of Area H (rear gardens of Farringdon Road properties) would receive at least two hours of sun on March 21. These are both considerably below the levels recommended in the BRE Guidelines and are likely a result of existing high local obstruction.

Transient Overshadowing

16.89. The Calthorpe Street site is largely used as a delivery and servicing yard associated with the adjacent Mount Pleasant Sorting Office and thus there is very little massing to produce any transient overshadowing surrounding the Caltorpe Street site. In regards to the Phoenix Place site, the massing is small and therefore, does not cast much shadow.

16.90. On December 21 shadow is cast on amenity Area G (the rear gardens serving 26-50 Calthorpe Street) between the hours of 09:00 and 10:00. However, there is currently no shadow cast by the buildings during the summer period on the neighbouring amenity areas. On March 21, shadow is cast on Area G at 08:00.

16.91. All shadows cast by the Calthorpe Street and Phoenix Place sites would move quickly throughout the day; never remaining in one place for a significant length of time.

Potential Effects

Demolition and Construction

16.92. The magnitude of the daylight, sunlight and overshadowing effects would vary throughout the demolition and construction phases, depending on the level of obstruction caused; tending towards the potential effects arising from their completion as they are built out. The assessments of the potential effects of the completed Development Scenarios therefore provide a 'worst case' and reference should be made to those assessments. Accordingly, no quantified assessments of the likely daylight, sunlight and overshadowing effects of the demolition and construction phases of each of the three Development Scenarios on adjacent residential properties and amenity areas were undertaken. However, the following general observations on the potential effects during the demolition and construction stages can be made.

Development Scenario 1

16.93. Owing to the almost open nature of the Site in its future baseline condition, the demolition of the existing buildings and structures on the Site would have very little or no effect on the daylight and sunlight within neither the neighbouring residential buildings nor the overshadowing on the neighbouring amenity areas.

16.94. The construction of Development Scenario 1 (the Entire Development) would, however, have a gradually increasing magnitude of daylight, sunlight and overshadowing effects on the residential buildings adjacent to the Site as the massing of the Entire Development increases. The potential effects of the Entire Development would therefore increase in magnitude, tending towards the potential effects arising from completion of the Entire Development.

16.95. The light pollution effects arising from any portable lighting apparatus used during the demolition and construction phase would be of **minor adverse significance** to those sensitive receptors located close to the Site and **negligible** to those located further away.

Development Scenario 2

16.96. Given the small nature of the existing Site, the demolition of the existing structures would not affect the levels of daylight and sunlight within the neighbouring residential properties nor result in any overshadowing effects. The construction of Development Scenario 2 would have an incremental effect on the surrounding residential properties increasing in magnitude as the massing increased. However, the potential effects arising from the construction of Development Scenario 2 would be less than those of the completed Development Scenario 2.

16.97. The use of portable lighting apparatus during the construction phase of developing the Calthorpe Street site may result **minor adverse** light pollution effects to those residential receptors located close to the Calthorpe Street site. However, the likely pollution effects would be **negligible** to those properties located further away.

Development Scenario 3

16.98. The demolition effects in terms of daylight, sunlight and overshadowing would be minimal or likely negligible given the small levels of existing massing on the Phoenix Place site. The effects of construction would vary and gradually increase throughout the construction phase. Therefore the potential effects would increase in magnitude incrementally as the massing increased; however, the effect of construction would likely be less than those of the completed Development Scenario 3.

16.99. The use of portable lighting apparatus during the construction phase of developing the Phoenix Place site may result in **minor adverse** light pollution effects to those residential receptors located close to the Phoenix Place site. However, the likely pollution effects would be **negligible** to those properties situated further away.

Completed Development

Development Scenario 1

16.100. Full details of the VSC, NSL and APSH as well as the overshadowing analysis of Development Scenario 1 are provided in Appendix 16.3 and a summary of the results is presented below.

Daylight

16.101. Table 16.5 provides a summary of the VSC and NSL results for Development Scenario 1.

Table 16.5: Summary of Daylight Results for Development Scenario 1 Compared to the Future Baseline

Address	Total No. of Windows that Meet VSC Criteria* compared to future Baseline	Total No. of Rooms that meet NSL Criterion**
1-16 Charles Simmons House	14 of 28 (50%)	25 of 28 (89%)
160 & 162 Farringdon Road	8 of 23 (35%)	9 of 13 (69%)
Margery Court	10 of 10 (100%)	10 of 10 (100%)
Sherston Court	30 of 43 (70%)	17 of 36 (47%)
4-15 Attneave Street	22 of 22 (100%)	17 of 17 (100%)
114-140 Farringdon Road (even)	60 of 153 (39%)	37 of 83 (45%)
142 – 146 Farringdon Road	6 of 24 (25%)	1 of 24 (4%)
96-106 Farringdon Road (even)	67 of 67 (100%)	26 of 26 (100%)
43 Rosebery Avenue	20 of 20 (100%)	5 of 5 (100%)
11-23 Mount Pleasant (odd)	95 of 95 (100%)	53 of 53 (100%)
1 Rosebery Court	38 of 38 (100%)	38 of 38 (100%)
45 Mount Pleasant	12 of 12 (100%)	4 of 4 (100%)
51-53 Mount Pleasant	4 of 26 (15%)	6 of 10 (60%)
55 Mount Pleasant	1 of 10 (10%)	2 of 4 (50%)
57 Mount Pleasant	2 of 10 (20%)	2 of 4 (50%)
1-2 Mews House	9 of 13 (69%)	4 of 6 (67%)
1-51 Rosebery Square	104 of 104 (100%)	75 of 84 (89%)
1-30 Laystall Court	24 of 70 (34%)	49 of 70 (70%)
37-48 Elm Street	106 of 120 (88%)	84 of 84 (100%)
Mullen Tower	22 of 22 (100%)	22 of 22 (100%)
1-26 Churston Mansions	51 of 51 (100%)	32 of 32 (100%)
20-50 Calthorpe Street (even)	70 of 113 (62%)	87 of 100 (87%)
23-43 Calthorpe Street (odd)	79 of 80 (99%)	46 of 46 (100%)
1-3 Pakenham Street	26 of 32 (81%)	15 of 15 (100%)
45-49 Calthorpe Street (odd)	18 of 18 (100%)	11 of 12 (92%)
Union Tavern	23 of 23 (100%)	10 of 10 (100%)
Total	921 of 1227 (75%)	688 of 836 (82%)

*Where VSC is less than 27% in the future baseline condition the Development Scenario is considered to meet the required criteria provided it retains at least 0.8 times its former value.

**Where NSL retained is at least 0.8 times its former value it is considered to meet the required criterion

16.102. As the results in Table 16.5 indicate, 921 (75%) out of the 1,227 windows assessed would either retain a VSC of at least 27% or retain a VSC which is at least 0.8 times its former value. All of the windows within the following properties would meet the BRE Guidelines criteria in regards to VSC and therefore the potential effect with regard to daylight availability on these properties would therefore be **negligible**:

- Margery Court;
- 4-15 Attneave Street;
- 96-106 Farringdon Road (even);
- 43 Rosebery Avenue;
- 11-23 Mount Pleasant (odd);
- 1 Rosebery Court;
- 45 Mount Pleasant;
- 1-51 Rosebery Square;
- Mullen Tower;
- 1-26 Churston Mansions;
- 45-49 Calthorpe Street (odd); and
- Union Tavern.

16.103. Within the remaining residential properties assessed, not all of the windows would meet the BRE Guidelines criteria for VSC and therefore, these properties were considered further in terms of the NSL.

23-43 Calthorpe Street, 37-48 Elm Street and 1-3 Pakenham Street

16.104. Whilst some of the windows within 23 to 43 Calthorpe Street, 37 to 48 Elm Street and 1 to 3 Pakenham Street would experience transgressions with regard to VSC, all of the habitable rooms within these properties would retain a daylight distribution which is at least 0.8 times its former value. The rooms within these properties would therefore meet the BRE Guidelines criteria and thus the potential effect of Development Scenario 1 in relation to daylight availability at 23 to 43 Calthorpe Street, 37 to 48 Elm Street and 1 to 3 Pakenham Street would be **negligible**.

1-16 Charles Simmons House

16.105. There are a total of 28 windows within 1 to 16 Charles Simmons House which face the Site, 14 (50%) of which would meet the BRE Guidelines criteria with regard to VSC. Of the 14 windows which would not comply with the BRE Guidelines criteria, eight have a marginalised (future baseline) level of VSC whereby the increase in massing as a result of Development Scenario 1 would result in a disproportionate alteration in daylight. In addition, 1-16 Charles Simmons House has overhanging architectural features which, by virtue of their position, obscure the view of the sky dome from a number of the windows and thus limit the ability for these apertures to achieve BRE Guidelines compliant levels of VSC.

16.106. The NSL method of assessment indicates that 25 (89%) out of the 28 rooms considered would meet the BRE Guidelines criterion. Of the three rooms which would not meet the BRE Guidelines criterion for NSL, all would experience alterations between 25% and 29.9%, although they would retain a view of the skydome to at least 50% of the total room area at the working plane. Therefore, the potential effect of Development Scenario 1 on daylight at 1 to 16 Charles Simmons House would therefore be of **minor adverse significance**.

160 & 162 Farringdon Road

16.107. Whilst only 35% of the windows within 160 and 162 Farringdon Road would meet the criteria for VSC, nine out of the 13 rooms assessed would retain an NSL of at least 0.8 times the former value. Whilst the remaining four rooms (located within 160 Farringdon Road) would experience an alteration in NSL beyond the BRE Guidelines permissible 20% reduction criterion, two would retain a view of the skydome to at least 50 % of their total area.

16.108. The potential effect of Development Scenario 1 on daylight at 160 and 162 Farringdon Road would be limited to 160 Farringdon Road (i.e. the potential effect on 162 would be **negligible**) and would be therefore be of **moderate adverse significance**.

Sherston Court

16.109. In terms of VSC, 30 (70%) out of the 43 windows of Sherston Court would meet the criteria set out within the BRE Guidelines. All 13 of the windows which do not meet the VSC criteria would experience an alteration in VSC of between 20 and 29.9% with 12 windows retaining a VSC of at least 21%.

16.110. In regards to NSL, 17 out of the 36 rooms assessed would retain an NSL of at least 0.8 times the former value; however, all of the remaining rooms would retain a view of the skydome to at least 50% of the total room area at the working plane.

16.111. The potential effect of Development Scenario 1 once completed and operational on daylight at Sherston Court would therefore be of **minor adverse significance**.

114-140 Farringdon Road (even)

16.112. A total of 153 windows within 114 to 140 Farringdon Road (even) were assessed in terms of VSC, 60 (39%) of which would meet the BRE Guidelines criteria.

16.113. In regards to NSL, 37 (45%) out of the 83 rooms would retain an NSL which is at least 0.8 times the former value. Of the 46 remaining rooms, 37 would retain a view of the sky dome to at least 50% of their total area. In addition, there are several rooms (levels 589 and 599 in the analysis within Appendix 16.3) which are located at basement level with a floor height which is 1.2m below ground and thus, by virtue of their position and existing local obstruction (as a result of the entrance stairways), have a limited potential to achieve BRE Guidelines compliant levels of daylight.

16.114. The potential effect of the completed Development Scenario 1 on daylight at 114 to140 Farringdon Road would therefore be of **minor** to **moderate adverse significance** (depending upon the property being considered).

142-146 Farringdon Road (even)

16.115. In regards to VSC, six (25%) out of the 24 windows within 142 to 146 Farringdon Road (even) would meet the BRE Guidelines criteria. Of the 18 windows which would not comply with the BRE Guidelines, 17 would retain a VSC of at least 20%. Only one of the 24 rooms assessed within these properties would meet the BRE Guidelines criterion for NSL. However, nearly all of the remaining 19 rooms would retain a view of the skydome to at least 50% of their total area at the working plane. The alterations in daylight would likely be a result of the unusually open nature of the Site.

16.116. The potential effects of the Development Scenario 1 once completed and operational on daylight at 142 to 146 Farringdon Road would therefore be of **substantial adverse significance**.

51-53 Mount Pleasant

16.117. Whilst only 15% of the windows within 51 to 53 Mount Pleasant would meet the BRE Guidelines criteria for VSC, six (60%) out of the ten rooms assessed would meet the NSL criterion. Of the remaining four rooms, two would experience an alteration of between 20 and 29.9% and three would retain a view of the skydome to at least 50% of the total area at the working plane.

16.118. The potential effect of the completed Development Scenario 1 on daylight at 51 to 53 Mount Pleasant would therefore be of **moderate adverse significance**.

55 Mount Pleasant

16.119. Whilst only 10% of the windows within 55 Mount Pleasant would meet the BRE Guidelines criteria for VSC, half of the rooms would retain a daylight distribution of at least 0.8 times their former value.

16.120. In regards to the two remaining rooms, one would retain a view of the sky dome to at least 50% of the 14 total room area whereas the other room has low existing levels of daylight (under the future baseline condition), whereby the increase in massing as a result of Development Scenario 1 would lead to a disproportionate alteration; triggering a technical breach.

16.121. However, the potential effect of the completed Development Scenario 1 daylight at 55 Mount Pleasant would therefore be of **minor adverse significance**.

57 Mount Pleasant

16.122. Two (20%) out of the ten windows assessed within 57 Mount Pleasant would meet the BRE Guidelines criteria for VSC. However, the remaining eight windows would retain a VSC of at least 14% (experiencing alterations of up to 50%). Two out of the four rooms within this property would meet the BRE Guidelines criterion for NSL. The remaining two rooms would retain a view of the skydome to at least 50% of the total room area at the working plane.

16.123. Therefore the potential effect of the completed Development Scenario 1 on daylight at 57 Mount Pleasant would therefore be of **moderate adverse significance**.

1-2 Mews House

16.124. A total of 13 windows were considered within 1 to 2 Mews House, nine (69%) of which would meet the BRE Guidelines criteria for VSC. The remaining four windows have marginalised existing (future baseline) levels of VSC as a result high local obstruction (neighbouring properties), whereby any increase in massing as a result of Development Scenario 1 would result in a disproportionate alteration and; triggering a technical breach.

16.125. Four out of six rooms would retain an NSL of at least 0.8 times their former value. The remaining two rooms have low existing daylight distribution (future baseline) and therefore, the increase of massing as a result of Development Scenario 1 would lead to a disproportionate alteration in daylight.

16.126. The potential effect of the completed Development Scenario 1 on daylight at 1 to 2 Mews House would therefore be of **minor adverse significance**.

1-30 Laystall Court

16.127. Whilst only 24 (34%) out of the 70 windows considered within 1 to 30 Laystall Court would meet the VSC criteria, 70% of the rooms within this property would comply with the BRE Guidelines criterion for NSL. Of the 21 rooms which would not comply with the NSL criterion, 19 would retain a view of the skydome to at least 50% of the total room area at the working plane.

16.128. The potential effect of the completed Development Scenario 1 on daylight at 1 to 30 Laystall Court would therefore be of **moderate adverse significance**.

20-50 Calthorpe Street (even)

16.129. 70 (62%) of the 113 windows considered within 20 to 50 Calthorpe Street (even) would retain a VSC of 27% or 0.8 times the former value and thus comply with the BRE Guidelines. Where transgressions occur these would likely be a result of the extensions / protruding features of these properties which restrict the view of the skydome from some apertures, combined with the open nature of the Site.

16.130. In terms of NSL, 87 out of the 100 rooms considered would meet the BRE Guidelines criterion. Of the 13 rooms which would not comply, ten would retain a view of the skydome to at least 50% of the total room area.

16.131. Given the alterations in daylight within 20 to 50 Calthorpe Street, the potential effect of the completed Development Scenario 1 would be of **minor** to **moderate adverse significance** (depending upon the property).

Sunlight

16.132. Full details of the APSH analysis are provided in Appendix 16.3 and a summary of the results is presented in Table 16.6 below. Only those windows which face the Site and are located within 90° of due south were considered in regards to APSH (as per the application of the BRE Guidelines).

Table 16.6: Summary of APSH Results Compared to the Future Baseline (Development Scenario 1)

Address	Total No. of Windows that Meet APSH Criteria
1-16 Charles Simmons House	22 of 28 (79%)
160 & 162 Farringdon Road	17 of 19 (89%)
Sherston Court	43 of 43 (100%)
4-15 Attneave Street	6 of 7 (86%)
114-140 Farringdon Road (even)	117 of 153 (76%)
142-146 Farringdon Road	24 of 24 (100%)
96-106 Farringdon Road (even)	59 of 59 (100%)
43 Rosebery Avenue	20 of 20 (100%)
1-2 Mews House	9 of 9 (100%)
1-51 Rosebery Avenue	17 of 20 (85%)
37-48 Elm Street	12 of 12 (100%)
1-26 Churston Mansions	12 of 12 (100%)

Address	Total No. of Windows that Meet APSH Criteria
20-50 Calthorpe Street (even)	73 of 97 (75%)
23-43 Calthorpe Street (odd)	80 of 80 (100%)
1-3 Pakenham Street	11 of 12 (92%)
45-49 Calthorpe Street (odd)	18 of 18 (100%)
Union Tavern	23 of 23 (100%)
Total	563 of 636 (89%)

16.133. 563 (89%) out of the 636 windows considered would meet the criteria set out within the BRE Guidelines.

16.134. The results of the assessment indicate that the completed Development Scenario 1 would have a **negligible effect** on sunlight at the following properties:

- Sherston Court;

16.135. 142-146 Farringdon Road (even);

- 96-106 Farringdon Road (even);
- 43 Rosebery Avenue;
- 1-2 Mews House;
- 37-48 Elm Street;
- 1-26 Churston Mansions;
- 23-43 Calthorpe Street;
- 45-49 Mount Pleasant; and
- Union Tavern.

1-16 Charles Simmons House

16.136. A total of 28 windows were considered within 1-16 Charles Simmons House, 22 (79%) of which would meet the BRE Guidelines criteria. There are six windows which would experience an alteration in sunlight beyond the criteria; these are located on the ground, first and second floors under overhanging architectural features. Such overhanging features obstruct the ability of these windows to achieve BRE Guidelines compliant levels of sunlight.

16.137. The potential effect of the completed Development Scenario 1 on sunlight at 1 to 16 Charles Simmons House would therefore be of **minor adverse significance**.

160 &162 Farringdon Road

16.138. There are 19 windows within 160 and 162 Farringdon Road which face the Site and which are located within 90° of due south. 17 (89%) out of the 19 windows would comply with the BRE Guidelines criteria for sunlight. Whilst the two remaining windows would experience a transgression in regards to winter sunlight, both would retain a total APSH of at least 25%. In addition, the majority of the windows within 160 and 162 Farringdon Road would retain a total APSH of at least 40%, which is considerably greater than the BRE Guidelines recommended 25% criterion.

16.139. The potential effect of the completed Development Scenario 1 on 160 and 162 Farringdon Road would therefore be of **minor adverse significance**.

4-15 Attneave Street

16.140. Six (86%) out of the seven windows assessed would meet the BRE criteria for sunlight within 4 to 15 Attneave Street. However, there is one window located at the lowest level which would experience a transgression of 27.3% in regards to total APSH. This window has low existing levels of winter sunlight, whereby any additional massing on the Site would result in a disproportionate alteration in sunlight (especially given the low position of the sun during the winter months); therefore triggering a technical breach.

16.141. The effect of the completed Development Scenario 1 on sunlight at 4 to 15 Attneave Street would therefore be of **minor adverse significance**.

114- 140 Farringdon Road (even)

16.142. 117 (75%) of the 153 windows assessed within 114- 140 Farringdon Road (even) would comply with the BRE Guidelines in regards to sunlight. 36 windows would experience an alteration in total and/or winter APSH beyond the suggested criteria. In the majority of cases this is a result of the low position of the sun during the winter months, with 26 of these windows retaining a total APSH of at least 20%.

16.143. The potential effect of the completed Development Scenario 1 on sunlight at 114 to 140 Farringdon Road would therefore be of **minor** to **moderate adverse significance** (depending upon the receptor).

1-51 Rosebery Square

16.144. 17 (85%) of the 20 windows considered would meet the BRE Guidelines criteria for sunlight. Of the three windows which would not meet the BRE Guidelines criteria, all have marginalised existing (future baseline) levels of sunlight, whereby any increase in massing on the Site would result in a disproportionate alteration; triggering a technical breach.

16.145. The potential effect of the completed Development Scenario 1 on sunlight at 1 to 51 Rosebery Square would therefore be of **minor adverse significance**.

20-50 Calthorpe Street (even)

16.146. 73 (75%) out of the 97 windows considered within 20 to 50 Calthorpe Street (even) would meet the BRE Guidelines criteria for sunlight. Of the 24 remaining windows, 18 would retain a total APSH of at least 20%.

16.147. The potential effect of the completed Development Scenario 1 on 20 to 50 Calthorpe Street would therefore be of **minor** to **moderate adverse significance** (depending upon the receptor).

1-3 Pakenham Street

16.148. There are 12 windows within 1 to 3 Pakenham Street which face the Site and which are located within 90° of due south. All but one of these windows would meet the BRE Guidelines criteria for sunlight. The effect on the remaining window would likely be a result of the low position of the sun during the winter period, as this window retains a total APSH of 28%.

16.149. The potential effect of the completed Development Scenario 1 on sunlight at 1 to 3 Pakenham Street would therefore be of **minor adverse significance**.

Hours in Sun

16.150. Full detailed results of the hours in sun analysis are provided in Appendix 16.4 and summarised in Table 16.7 below.

Table 16.7: Summary of Hours in Sun Results – Development Scenario 1

Amenity Area	Proportion receiving at least 2 hours of sun on March 21
A (rear gardens of 1-10 Wren Street)	89.8%
B (rear gardens of 1-21 Calthorpe Street)	10.9%
C (rear gardens of 12-20 Wren Street)	94.8%
D (rear gardens of 23-43 Calthorpe Street)	68%
E (forecourt of 45-49 Calthorpe Street)	99.7%
F (rear gardens of 2-24 Calthorpe Street)	53.9%
G (rear gardens of 26-50 Calthorpe Street)	84.2%
H (rear gardens of Farringdon Road properties)	35%
I (Rosebery Avenue public square)	98.1%

16.151. A total of nine amenity areas were considered in the hours in sun assessment. Seven out of these nine areas would achieve full BRE Guidelines compliance; receiving at least two hours of direct sunlight to over 50% of their total area on March 21. In regards to Area B (rear gardens of 1-21 Calthorpe Street) and Area H (rear gardens of Farringdon Road properties), neither would experience an alteration beyond the 20% permissible reduction criterion and Area B would not experience any alteration from the future baseline condition.

16.152. The potential effect of the completed Development Scenario 1 would therefore have a **negligible effect** on hours in sun (overshadowing) on the neighbouring amenity areas.

Transient Overshadowing

16.153. Full details of the analysis of transient overshadowing are provided in Appendix 16.5 and summarised below.

December 21

16.154. The completed Development Scenario 1 would cast shadow on amenity Area E (forecourt of 45-49 Calthorpe Street) between the hours of 10:00 and 12:00, and a marginal increase in the shadow on Area G (the rear gardens of the Calthorpe Street properties) during the winter period.

16.155. No shadow would be cast by the completed Development Scenario 1 on the rear gardens of the Farringdon Road properties or amenity Area I (Rosebery Avenue public square).

June 21

16.156. During the summer period, shadow would be cast on amenity area F by the completed Development Scenario 1 between the hours of 06:00 and 07:00 and on Areas G and E between 06:00 and 09:00. The shadow cast would, however, move quickly throughout the day and not remain in any one place for very long.

March 21

16.157. On the March 21st, the completed Development Scenario 1 would cast shadow on amenity Area G (the rear gardens of 26 to 50 Calthorpe Street) between the hours of 08:00 and 10:00. Transient shadow would also be cast on Area E between the hours of 07:00 and 09:00; however, the shadow cast would move quickly throughout the day and not remain in one place for very long. No shadow would be cast by the completed Development Scenario 1 on the playground of the Christopher Hatton Primary School or on the rear gardens of the Farringdon Road properties.

16.158. Whilst the BRE Guidelines do not provide any criteria for transient overshadowing, the potential effect of the completed Development Scenario 1 on transient overshadowing would be of **minor adverse significance**.

Development Scenario 2

Daylight

16.159. Full details of the daylight results for the completed Calthorpe Street Development are provided in Appendix 16.3 and are summarised in Table 16.8 below:

Table 16.8: Summary of the Daylight Results Compared to the Future Baseline (Development Scenario 2)

Address	Total No. of Windows that Meet VSC Criteria* Compared to Future Baseline	Total No. of Rooms that meet NSL Criterion**
1-16 Charles Simmons House	14 of 28 (50%)	25 of 28 (89%)
160 & 162 Farringdon Road	8 of 23 (35%)	9 of 13 (69%)
Margery Court	10 of 10 (100%	10 of 10 (100%)
Sherston Court	30 of 43 (70%)	17 of 36 (47%)
4-15 Attneave Street	22 of 22 (100%)	17 of 17 (100%)
114-140 Farringdon Road (even)	60 of 153 ((59%)	37 of 83 (45%)
142-146 Farringdon Road	6 of 24 (25%)	1 of 24 (4%)
96-106 Farringdon Road (even)	67 of 67 (100%)	26 of 26 (100%)
43 Rosebery Avenue	20 of 20 (100%)	5 of 5 (100%)
11-23 Mount Pleasant (odd)	95 of 95 (100%)	53 of 53 (100%)
1 Rosebery Court	38 of 38 (100%)	38 of 38 (100%)
45 Mount Pleasant	12 of 12 (100%)	4 of 4 (100%)
51-53 Mount Pleasant	26 of 26 (100%)	10 of 10 (100%)
55 Mount Pleasant	10 of 10 (100%)	4 of 4 (100%)
57 Mount Pleasant	10 of 10 (100%)	4 of 4 (100%)
1-2 Mews House	13 of 13 (100%)	6 of 6 (100%)
1-51 Rosebery Square	104 of 104 (100%)	84 of 84 (100%)
1-30 Laystall Court	70 of 70 (100%)	70 of 70 (100%)
37-48 Elm Street	120 of 120 (100%)	84 of 84 (100%)
Mullen Tower	22 of 22 (100%)	22 of 22 (100%)
1-26 Churston Mansions	51 of 51 (100%)	32 of 32 (100%)
20-50 Calthorpe Street (even)	96 of 113 (85%)	93 of 100 (93%)
23-43 Calthorpe Street (odd)	79 of 80 (99%)	46 of 46 (100%)
1-3 Pakenham Street	11 of 12 (92%)	15 of 15 (100%)
45-49 Calthorpe Street (odd)	18 of 18 (100%)	11 of 12 (92%)
Union Tavern	23 of 23 (100%)	10 of 10 (100%)
Total	1,050 of 1,227 (86%)	733 of 836 (88%)

*Where VSC is less than 27% in the future baseline condition the Development Scenario is considered to meet the required criteria provided it retains at least 0.8 times its former value.

**Where NSL retained is at least 0.8 times its former value it is considered to meet the required criteria

16.160. As the results in Table 16.8 indicate, 1,050 (86%) of the 1,227 windows assessed would meet the BRE Guidelines criteria for VSC. All of the windows within the following properties would retain a VSC of 27% or retain at least 0.8 times their former value. Therefore, the effect of the completed Development Scenario 2 on daylight at the properties listed below would be **negligible**:

- Margery Court;
- 4-15 Attneave Street;
- 96-106 Farringdon Road (even);
- 43 Rosebery Avenue;
- 11-23 Mount Pleasant (odd);
- 1 Rosebery Court;
- 45 Mount Pleasant;
- 51-53 Mount Pleasant;
- 55 Mount Pleasant;
- 57 Mount Pleasant;
- 1-2 Mews House;
- 1-51 Rosebery Square;
- 1-30 Laystall Court;
- 37-48 Elm Street;
- Mullen Tower;
- 1-26 Churston Mansions;
- 45-49 Calthorpe Street (odd); and
- UnionTavern.

16.161. Within the remaining properties, not all of the windows would meet the BRE Guidelines criteria for VSC and thus, these properties were assessed in terms of NSL. As a result of the completed Development Scenario 2, all of the rooms within 23 to 43 Calthorpe Street and 1 to 3 Pakenham Street would retain an NSL of at least 0.8 times their former value and therefore would comply with the BRE Guidelines.

16.162. The potential effect of the completed Development Scenario 2 on sunlight at 23 to 43 Calthorpe Street and 1 to 3 Pakenham Street would therefore be **negligible**.

16.163. The effect of the completed Development Scenario 2 would be limited to those properties which are located close to the Calthorpe Street Development. The effects on those properties which have windows and rooms which would not meet the BRE Guidelines criteria for daylight are discussed in more detail below.

1-16 Charles Simmons House

16.164. Of the 28 windows assessed in 1 to 16 Charles Simmons House, 14 windows would meet the BRE Guidelines daylight criteria. This is likely attributable to the proximity of this property to the Calthorpe Street Development. 25 out of the 28 rooms assessed in these properties would meet the BRE Guidelines criterion for NSL. These properties have a number of overhanging features which obscure the view of the skydome and limit the ability for apertures (located below these features) to achieve BRE Guidelines compliant levels of daylight.

16.165. The potential effect of the completed Development Scenario 2 on daylight at 1 to 16 Charles Simmons House would therefore be **minor adverse significance**.

160 & 162 Farringdon Road

16.166. As the results in Table 16.8 indicate, the potential effect of the completed Development Scenario 2 is the same as for Development Scenario 1. This is likely due to the proximity of the Calthorpe Street Development to 160 and 162 Farringdon Road. Whilst eight of the 23 windows would meet the VSC criteria, 69% of the rooms assessed within these properties would meet the NSL criterion.

16.167. The potential effect of the completed Development Scenario 2 on daylight at 160 and 162 Farringdon Road would therefore be of **moderate adverse significance**.

Sherston Court

16.168. 30 out of the 43 windows within Sherston Court would meet the BRE Guidelines criteria for VSC, whereas 17 out of the 36 rooms assessed would meet the BRE Guidelines criteria for NSL. Therefore the potential effect of the completed Development Scenario 2 on daylight at Sherston Court would be of **minor adverse significance**.

114-140 Farringdon Road (even)

16.169. A total of 153 windows were considered within 114 to140 Farringdon Road, 60 of which would comply with the BRE Guidelines criteria for VSC. In terms of NSL 37 out of the 83 rooms assessed would retain a daylight distribution which is at least 0.8 times the former value.

16.170. The potential effect of the completed Development Scenario 2 on daylight at 114 to140 Farringdon Road (even) would therefore be of **minor** to **moderate adverse significance** (depending upon the property considered).

142-146 Farringdon Road (even)

16.171. Six (25%) of the 24 windows assessed in 142 to 146 Farringdon Road (even) would comply with the BRE Guidelines criteria for VSC. However, the results indicate that one out of the 24 rooms assessed would meet the criterion for NSL. Of the remaining 23 rooms, all would retain a view of the skydome to at least 50% of their total area at the working plane.

16.172. The potential effect of the completed Development Scenario 2 on daylight at 142 to 146 Farringdon Road (even) would therefore be of **moderate** to **substantial adverse significance** (depending upon the receptor considered).

20-50 Calthorpe Street (even)

16.173. There are a total of 113 windows within 20 to 50 Calthorpe Street (even), 96 (85%) of which would meet the BRE Guidelines criteria for VSC. Of the 17 remaining windows (located at the lowest level), 11 would experience an alteration in VSC, which is less than 30%. 93 (93%) of the 100 rooms considered within these properties would meet the BRE Guidelines criterion for NSL. Of the seven rooms which would experience a transgression in terms of NSL, all would retain a view of the skydome to at least 50% of the total room area at the working plane.

16.174. The potential effect of the completed Development Scenario 2 on daylight at 20 to 50 Calthorpe Street (even) would therefore be of **minor** to **moderate adverse significance** (depending upon the property).

Sunlight

16.175. Full details of the APSH results for the completed Development Scenario 2 are provided in Appendix 16.3 and summarised within Table 16.9 below.

Table 16.9: Summary of Sunlight Results Compared to the Future Baseline (Development Scenario 2)

Address	Total No. of Windows that Meet APSH Criteria
1-16 Charles Simmons House	22 of 28 (79%)
160 & 162 Farringdon Road	17 of 19 (89%)
Sherston Court	43 of 43 (100%)
4-15 Attneave Street	6 of 7 (86%)
114-140 Farringdon Road (even)	117 of 153 (76%)
142-146 Farringdon Road	24 of 24 (100%)
96-106 Farringdon Road (even)	59 of 59 (100%)
43 Rosebery Avenue	20 of 20 (100%)
1-2 Mews House	9 of 9 (100%)
1-51 Rosebery Avenue	20 of 20 (100%)
37-48 Elm Street	12 of 12 (100%)
1-26 Churston Mansions	12 of 12 (100%)
20-50 Calthorpe Street (even)	84 of 97 (87%)
23-43 Calthorpe Street (odd)	80 of 80 (100%)
1-3 Pakenham Street	11 of 12 (92%)
45-49 Calthorpe Street (odd)	18 of 18 (100%)
Union Tavern	23 of 23 (100%)
Total	577 of 636 (91%)

16.176. Of the 577 windows assessed, 636 (91%) would meet the BRE Guidelines criteria for sunlight. The results of the assessment indicate that the completed Development Scenario 2 would have a **negligible effect** on the following properties:

- Sherston Court;
- 96-106 Farringdon Road (even);
- 142-146 Farringdon Road (even);
- 43 Rosebery Avenue;
- 1-2 Mews House;
- 1-51 Rosebery Avenue;
- 37-48 Elm Street;
- 1-26 Churston Mansions;
- 23-43 Calthorpe Street (odd);
- 45-49 Calthorpe Street (odd); and
- Union Tavern.

16.177. The remaining properties are considered in more detail below.

1-16 Charles Simmons House

16.178. As the results in Table 16.9 indicate, 22 (79%) out of the 28 windows assessed in 1 to 16 Charles Simmons House would meet the BRE Guidelines criteria in regards to APSH. The six remaining windows are situated under architectural features, which restrict the ability of these windows to achieve BRE Guidelines compliant levels of APSH.

16.179. The potential effect of the completed Development Scenario 2 on sunlight at 1 to 16 Charles Simmons House would therefore be of **minor adverse significance**.

160 &162 Farringdon Road

16.180. Of the 19 windows assessed in these properties, 17 (89%) would meet the BRE Guidelines criteria in regards to APSH. The potential effect of the completed Development Scenario 2 would therefore be of **minor adverse significance**.

4-15 Attneave Street

16.181. As Table 16.9 indicates, six out of the seven windows (86%) assessed in 4 to 15 Attneave Street would comply with the BRE Guidelines for sunlight. This is likely a result of the proximity of the Calthorpe Street Development to 4 to 15 Attneave Street.

16.182. The potential effect of the completed Development Scenario 2 on sunlight at 4 to 15 Attneave Street would therefore be of **minor adverse significance**.

114-140 Farringdon Road (even)

16.183. As a result of Development Scenario 2, 75% of the 153 windows in 114 to 140 Farringdon Road (even) would meet the BRE Guidelines criteria for sunlight. Therefore, the effect of the completed Development Scenario 2 on sunlight at 114 to 140 Farringdon Road (even) would be of **minor** to **moderate adverse significance** (depending upon the residential receptor being considered).

20-50 Calthorpe Street (even)

16.184. 84 (87%) out of the 97 windows considered within *20-50 Calthorpe Street (even)* would meet the BRE Guidelines criteria for sunlight. Of the remaining 13 windows, 12 would retain a total APSH of at least 18%. The effect of the completed Development Scenario 2 on 20 to 50 Calthorpe Street (even) would therefore be of **minor** to **moderate adverse significance** (depending upon the receptor).

1-3 Pakenham Street

16.185. Of the 12 windows assessed within 1 to 3 Pakenham Street, 11 (92%) would comply with the BRE Guidelines criteria for sunlight. The remaining window would retain a total APSH of 28%. The transgression is likely a result of the low position of the sun during the winter months.

16.186. The potential effect of the completed Development Scenario 2 on sunlight at 1 to 3 Pakenham Street would therefore be of **minor adverse significance**.

Hours in Sun

16.187. Full detailed results of the hours in sun analysis are provided in Appendix 16.4 and summarised in Table 16.10 below.

Table 16.10: Summary of Hours in Sun Results (Development Scenario 2)

Amenity Area	Proportion Receiving at Least 2 Hours of Sun on March 21
A (rear gardens of 1-10 Wren Street)	89.8%
B (rear gardens of 1-21 Calthorpe Street)	10.9%
C (rear gardens of 12-20 Wren Street)	94.8%
D (rear gardens of 23-43 Calthorpe Street)	68%
E (forecourt of 45-49 Calthorpe Street)	99.7%
F (rear gardens of 2-24 Calthorpe Street)	52.2%
G (rear gardens of 26-50 Calthorpe Street)	91.7%
H (rear gardens of Farringdon Road properties)	35%
I (Rosebery Avenue public square)	98.1%

16.188. A total of nine amenity areas were considered in regards to the hours in sun assessment. Seven out of these nine areas would achieve full BRE Guidelines compliance; receiving at least two hours of direct sunlight to over 50% of their total area on March 21. In regards to amenity Areas B and H, neither would experience an alteration beyond the 20% permissible reduction criterion and Area B would not experience any alteration from the future baseline condition.

16.189. Therefore, the potential effect of the completed Development Scenario 2 on hours in sun (overshadowing) to the nearby amenity areas would be **negligible**.

16.190. Transient Overshadowing

16.191. Full details of the transient overshadowing results are provided in Appendix 16.5 and summarised below.

December 21

16.192. During the winter period, the completed Development Scenario 2 would cast a marginal amount of shadow on amenity Area G at 09:00. In addition, shadow would be cast on amenity Area E between the hours of 10:00 and 12:00. However, this would move quickly throughout the day and not remain in one place for very long.

June 21

16.193. On June 21st, shadow would be cast on amenity Areas E and G between the hours of 06:00 and 09:00 and on amenity area F between 06:00 and 07:00. In regards to Area I, shadow would be cast at 08:00. However, there would be no shadow cast to the remaining amenity areas or the playground of the Christopher Hatton Primary School.

March 21

16.194. Development Scenario 2 would cast shadow on amenity Area E between 07:00 and 09:00. There would also be a marginal increase in the shadow cast on amenity Area G between the hours of 08:00 and 10:00.

16.195. Whilst the BRE Guidelines do not provide any criteria for transient overshadowing, the potential effect of the completed Development Scenario 2 transient overshadowing to the surrounding amenity areas would be of **minor adverse significance**.

Development Scenario 3

Daylight

16.196. Full details of the daylight results for the completed Development Scenario 3 are provided in Appendix 16.11 and summarised in Table 16.11 below:

Table 16.11: Summary of Daylight Results Compared to the Future Baseline (Development Scenario 3)

Address	Total No. of Windows that Meet VSC Criteria* compared to future Baseline	Total No. of Rooms that meet NSL Criterion**
1-16 Charles Simmons House	28 of 28 (100%)	28 of 28 (100%)
160 & 162 Farringdon Road	23 of 23 (100%)	13 of 13 (100%)
Margery Court	10 of 10 (100%)	10 of 10 (100%)
Sherston Court	43 of 43 (100%)	36 of 36 (100%)
4-15 Attneave Street	22 of 22 (100%)	17 of 17 (100%)
114-140 Farringdon Road (even)	153 of 153 (100%)	83 of 83 (100%)
142-146 Farringdon Road	24 of 24 (100%)	24 of 24 (100%)
96-106 Farringdon Road (even)	67 of 67(100%)	26 of 26 (100%)
43 Rosebery Avenue	20 of 20 (100%)	5 of 5 (100%
11-23 Mount Pleasant (odd)	95 of 95 (100%)	53 of 53 (100%)
1 Rosebery Court	38 of 38 (100%)	38 of 38 (100%)
45 Mount Pleasant	12 of 12 (100%)	4 of 4 (100%)
51-53 Mount Pleasant	4 of 26 (15%)	6 of 10 (60%)
55 Mount Pleasant	1 of 10 (10%)	2 of 4 (50%)
57 Mount Pleasant	2 of 10 (20%)	2 of 4 (50%)
1-2 Mews House	9 of 13 (69%)	4 of 6 (67%)
1-51 Rosebery Square	104 of 104 (100%)	75 of 84 (89%)
1-30 Laystall Court	24 of 70 (34%)	49 of 70 (70%)
37-48 Elm Street	106 of 120 (88%)	84 of 84 (100%)
Mullen Tower	22 of 22 (100%)	22 of 22 (100%)
1-26 Churston Mansions	51 of 51 (100%)	32 of 32 (100%)
20-50 Calthorpe Street (even)	106 of 113 (94%)	95 of 100 (95%)
23-43 Calthorpe Street (odd)	80 of 80 (100%)	46 of 80 (58%)
1-3 Pakenham Street	32 of 32 (100%)	15 of 15 (100%)
45-49 Calthorpe Street (odd)	18 of 18 (100%)	12 of 12 (100%)
Union Tavern	23 of 23 (100%)	10 of 10 (100%)
Total	1,117 of 1,227 (91%)	791 of 836 (95%)

*Where VSC is less than 27% in the future baseline condition the Development Scenario is considered to meet the required criteria provided it retains at least 0.8 times its former value

**Where NSL retained is at least 0.8 times its former value it is considered to meet the required criteria

16.197. The results in Table 16.11 indicate that 1,117 (91%) out of the 1,227 windows would meet the BRE Guidelines criteria for VSC.

All of the windows within the following properties would retain a VSC of 27% or at least 0.8 times the former value. The potential effect of the completed Development Scenario 3 on daylight at these properties would therefore be **negligible:**

- 1-16 Charles Simmons House;
- 160 &162 Farringdon Road;
- Margery Court;
- Sherston Court;
- 114-140 Farringdon Road (even);
- 142-46 Farringdon Road (even);
- 96-106 Farringdon Road (even);
- 43 Rosebery Avenue;
- 11-23 Mount Pleasant (odd);
- 1 Rosebery Court;
- 45 Mount Pleasant;
- 1-51 Rosebery Square;
- Mullen Tower;
- 1-26 Churston Mansions;
- 23-43 Calthorpe Street (odd);
- 1-3 Pakenham Street;
- 45-49 Calthorpe Street (odd); and
- Union Tavern.

16.198. The remaining properties were assessed in terms of NSL. The NSL results for all the rooms within 37 to 48 Elm Street would retain a daylight distribution of at least 0.8 times their former value. The potential effect of the completed Development Scenario 3 on sunlight at 37 to 48 Elm Street would therefore be **negligible**.

16.199. The daylight effects on the remaining properties are considered in more detail below:

51-53 Mount Pleasant

16.200. As the results within Table 16.11 indicate, 15% of the windows within 51 to 53 Mount Pleasant would meet the BRE Guidelines criteria for VSC, whereas 60% of the rooms within this property would meet the NSL criterion. Of the four remaining rooms, three would retain a view of the sky dome to at least 50% of the total room area at the working plane.

16.201. The potential effect of the completed Development Scenario 3 would therefore be of **moderate adverse significance**.

55 Mount Pleasant

16.202. In regards to VSC, one out of the ten windows assessed in 55 Mount Pleasant would meet the BRE Guidelines criteria for VSC. However, 50% of the rooms assessed would retain a daylight distribution which is at least 0.8 times the former value. The potential effect of the completed Development Scenario 3 on daylight at 55 Mount Pleasant would therefore be of **minor adverse significance**.

57 Mount Pleasant

16.203. As the results in Table 16.11 indicate two (20%) out of the ten windows assessed within 57 Mount Pleasant would meet the BRE Guidelines criteria for VSC. However, the remaining eight windows would retain a VSC of at least 14%. Two out of the four rooms within this property would meet the BRE Guidelines criterion for NSL. The remaining two rooms would retain a view of the skydome to at least 50% of the total room area at the working plane.

16.204. The potential effect of the completed Development Scenario 3 on daylight to 57 Mount Pleasant would therefore be of **moderate adverse significance**.

1-30 Laystall Court

16.205. Of the 70 windows within 1 to 30 Laystall Court, 24 (34%) would comply with the BRE Guidelines criteria for VSC, whereas 70% of the rooms within this property would meet the criteria for NSL.

16.206. The potential effect of the completed Development Scenario 3 is on daylight at 1 to 30 Laystall Court would therefore be of **moderate adverse significance**.

20-50 Calthorpe Street

16.207. There are a total of 113 windows within 20 to 50 Calthorpe Street, of which 106 (94%) would meet the BRE Guidelines criteria for VSC. The seven remaining windows are located within 26 and 28 Calthorpe Street, which are located close to and directly overlook the Phoenix Place Development. In terms of NSL, 95% of the rooms considered would retain a daylight distribution which is at least 0.8 times its former value.

16.208. The potential effect of the completed Development Scenario 3 on daylight at 20 to 50 Calthorpe Street would therefore be **negligible**, with the exception of 26 and 28 Calthorpe Street, which would experience an effect of **moderate adverse significance**.

Sunlight

16.209. Full details of the APSH analysis are provided in Appendix 16.3 and summarised in Table 16.12 below. Only those windows which face the Site and are located within 90° of due south were assessed.

Table 16.12: Summary of Sunlight Results (Development Scenario 3)

Address	Total No. of Windows that Meet APSH Criteria
1-16 Charles Simmons House	28 of 28 (100%)
160 & 162 Farringdon Road	19 of 19 (100%)
Sherston Court	43 of 43 (100%)
4-15 Attneave Street	7 of 10 (70%)
114-140 Farringdon Road (even)	153 of 153(100%)
142-146 Farringdon Road	24 of 24 (100%)
96-106 Farringdon Road (even)	59 of 59 (100%)
43 Rosebery Avenue	20 of 20 (100%)
1-2 Mews House	9 of 9 (100%)
1-51 Rosebery Avenue	17 of 20 (85%)
37-48 Elm Street	12 of 12 (100%)
1-26 Churston Mansions	12 of 12 (100%)
20-50 Calthorpe Street (even)	90 of 97 (93%)
23-43 Calthorpe Street (odd)	80 of 80 (100%)
1-3 Pakenham Street	12 of 12 (100%)
45-49 Calthorpe Street (odd)	18 of 18(100%)
Union Tavern	23 of 23 (100%)
Total	626 of 636 (98%)

16.210. On completion of Development Scenario 3, 626 (98%) of the 636 windows assessed would meet the BRE Guidelines criteria for sunlight. The results of the analysis indicate that the completed Development Scenario 3 would have a **negligible effect** on the following properties:

- 1-16 Charles Simmons House;
- 160 &162 Farringdon Road;
- Sherston Court;
- 4-15 Attneave Street;
- 114-140 Farringdon Road (even);
- 96-106 Farringdon Road (even);
- 142-146 Farringdon Road (even);
- 43 Rosebery Avenue;
- 1-2 Mews House;
- 37-48 Elm Street;
- 1-26 Churston Mansions;
- 23-43 Calthorpe Street (odd);
- 1-3 Pakenham Street
- 45-49 Calthorpe Street (odd); and
- Union Tavern.

16.211. The effect of the completed Development Scenario 3 on sunlight at 1 to 51 Rosebery Square and 20 to 50 Calthorpe Street are considered in more detail below.

1-51 Rosebery Square

16.212. 17 (85%) of the 20 windows considered within 1-51 Rosebery Square would meet the BRE Guidelines criteria for sunlight. Of the three windows which would not meet the sunlight criteria, all have marginalised existing (future baseline) levels of sunlight, whereby any alteration in the massing on the Site would result in a disproportionate alteration in sunlight; triggering a technical breach.

16.213. The potential effect of the completed Development Scenario 3 on sunlight at 1 to 51 Rosebery Square would therefore be of **minor adverse significance**.

20-50 Calthorpe Street (even)

16.214. Of the 97 windows considered within 20 to 50 Calthorpe Street, 90 (93%) would comply with the BRE Guidelines criteria for sunlight. Of the seven windows which would experience a transgression, two are located within 26 Calthorpe Street and the remaining five within 28 Calthorpe Street. Four out of these seven windows would retain a total ASPH of at least 25% and thus the predicted transgressions in sunlight are likely a result of the low position of the sun during the winter months.

16.215. The potential effect of the completed Development Scenario 3 on sunlight at 20 to 50 Calthorpe Street (even) would therefore be **negligible**, with the exception of 26 and 28 Calthorpe Street where the effect of the completed Development Scenario 3 on sunlight would be of **minor** to **moderate adverse significance** (depending upon the receptor considered).

Hours in Sun

16.216. Full detailed results of the hours in sun analysis are provided in Appendix 16.4 and summarised in Table 16.13

Table 16.13: Summary of Hours in Sun Results - Development Scenario 3

Amenity Area	Proportion Receiving at Least 2 Hours of Sun on March 21
A (rear gardens of 1-10 Wren Street)	89.8%
B (rear gardens of 1-21 Calthorpe Street)	10.9%
C (rear gardens of 12-20 Wren Street)	94.8%
D (rear gardens of 23-43 Calthorpe Street)	68%
E (forecourt of 45-49 Calthorpe Street)	99.7%
F (rear gardens of 2-24 Calthorpe Street)	53.9%
G (rear gardens of 26-50 Calthorpe Street)	86.2%
H (rear gardens of Farringdon Road properties)	35.3%
I (Rosebery Avenue public square)	98.1%

16.217. A total of nine amenity areas surrounding the Phoenix Place Development have been considered in regards to the hours in sun assessment. Seven out of these nine areas would achieve full BRE Guidelines compliance; receiving at least two hours of direct sunlight to over 50% of their total area on March 21. In regards to amenity Areas B (rear gardens of 1-21 Calthorpe Street) and H (rear gardens of Farringdon Road properties), neither would experience an alteration beyond the 20% permissible reduction criterion and area B would not experience any alteration from the future baseline condition.

16.218. The potential effect of the completed Development Scenario 3 on hours in sun (overshadowing) on surrounding amenity areas would therefore be **negligible**.

Transient overshadowing

16.219. Full details of the transient overshadowing analysis are provided in Appendix 16.5 and summarised below.

December 21

16.220. On completion of Development Scenario 3, shadow would be cast on amenity Area G between the hours of 09:00 and 11:00. However, no shadow would be cast on any of the other amenity areas assessed or the Christopher Hatton Primary School playground during the winter period.

June 21

16.221. During the summer period, there would be a slight increase in the level of shadow cast on Area F between 06:00am and 07:00am; however, no shadow would be cast on any of the other neighbouring amenity areas (including the Christopher Hatton Primary School playground).

March 21

16.222. On the 21 March, Development Scenario 3 would cast shadow on amenity Area F at 07:00am and on amenity area G between the hours of 08:00 and 09:00.

16.223. The potential effect of the completed Development Scenario 3 in terms of transient overshadowing at the surrounding amenity areas would therefore be **negligible** to **minor adverse significance** (amenity Areas G and F).

Mitigation Measures

Demolition and Construction

Development Scenarios 1, 2 and 3

16.224. Although the magnitude of the daylight, sunlight and overshadowing effects during the demolition and construction phases of the three Development Scenarios would tend towards the effects arising from their completion as they are built out, no specific measures would be available to mitigate the potential effects of the gradual increase in massing associated with each of the three Development Scenarios.

16.225. Demolition and construction of each of the three Development Scenarios are likely to involve the use of temporary lighting which could result in light spillage towards those receptors located close to the Site. However, this would be mitigated by positioning the lighting in such a way as to avoid light spill towards nearby receptors.

Completed Development

Daylight and Sunlight

Development Scenarios 1, 2 and 3

16.226. Throughout the evolution of each of the Development Scenarios, consideration was given to the potential daylight and sunlight effects on the neighbouring residential receptors. Therefore, given the relatively high levels of BRE Guidelines criteria compliance in such a dense urban location, no further mitigation measures for Development Scenario 1, 2 and 3 would be necessary. The effects of each of the Development Scenarios on daylight and sunlight would be within the intention and application of the BRE Guidelines.

Hours in Sun

Development Scenarios 1, 2 and 3

16.227. Development Scenarios 1, 2 and 3 would have a **negligible effect** in terms of the hours in sun (overshadowing) on the neighbouring amenity areas and therefore no mitigation measures would be required.

Transient Overshadowing

Development Scenarios 1, 2 and 3

16.228. The potential effect of Development Scenarios 1, 2 and 3 on transient overshadowing would be **minor** adverse, with a marginal increase in shadow on the neighbouring amenity areas. However, this shadowing would be temporary and not remain in one place very long. Therefore, no mitigation measures for transient overshadowing would be necessary.

Likely Residual Effects

Demolition and Construction

Development Scenarios 1, 2 and 3

16.229. Given the relatively open nature of both the Calthorpe Street and Phoenix Place sites the demolition would have very little, if any effect at all on the daylight and sunlight to the neighbouring residential properties. The effects of the construction works in terms of daylight sunlight and overshadowing associated with each of the Development Scenarios would increase incrementally as the massing increases; however, the effects would likely be less than those of each of the completed Development Scenarios.

16.230. In regards to light pollution, the likely residual effects would be **negligible**, based on the assumption that any portable lighting would be positioned in such a way as to avoid light spillage light towards the neighbouring residential properties.

16.231. The worst case likely residual effects of construction works on the Site would be comparable to the effects arising from each of the three Development Scenarios once completed. Therefore, reference should be made to the following sections.

Completed Development

Development Scenario 1

Daylight

16.232. 82% out of the rooms assessed within the neighbouring residential properties would meet the BRE Guidelines criterion for NSL. No additional mitigation measures beyond the sensitive design of the Entire Development would be required. Therefore, the likely residual effects of the completed Development Scenario 1 on daylight would be **negligible** at 15 of the 26 properties assessed and **minor** to **moderate adverse** at 10 of the properties assessed. The likely residual effect on 142 to 146 Farringdon Road on daylight would be substantial **adverse**. These predicted effects are a result of the unusually cleared nature of the Site in the future baseline condition. If the Site were currently occupied by buildings of similar scale to those in the surrounding area, the future baseline conditions would be worse and the reduction in daylight and sunlight as a result of the completed Development Scenario 1 would not be as pronounced as reported in this Chapter.

Sunlight

16.233. Given the relatively high level of BRE Guidelines criteria compliance for sunlight in such a dense urban area, no mitigation beyond the sensitive design of Entire Development would be necessary. The likely residual effects of the completed Development Scenario 1 on sunlight would be **negligible** to 10 out of the 17 properties assessed and of **minor adverse significance** at six properties. One property would experience a likely **moderate adverse** residual effect on sunlight.

Hours in Sun

16.234. Because no mitigation measures would be required for hours in sun (overshadowing) at the surrounding amenity areas the likely residual effect of the completed Development Scenario 1 would be **negligible**.

Transient Overshadowing

16.235. The likely residual effects of the completed Development Scenario 1 on transient overshadowing would remain as being of **minor adverse significance**. This is likely a result of the unusually open nature of the Site in the future baseline condition. The shadow would move quickly throughout the day, not remaining in one place for very long.

Development Scenario 2

Daylight

16.236. In regards to Development Scenario 2, 88% out of the rooms considered within the neighbouring residential properties would meet the BRE Guidelines criterion for NSL. No additional mitigation measures, beyond the sensitive design of the Calthorpe Street Development would be required. Therefore the likely residual effect of the completed Development Scenario 2 on daylight would be **negligible** at 20 of the 26 properties considered and **minor** to **moderate adverse** at five properties. The likely residual effect on daylight at 142 to 146 Farringdon Road would be **substantial adverse**. Again, these likely residual effects are a result of the unusually cleared nature of the Calthorpe Street site in the future baseline condition. If the Calthorpe Street site comprised buildings of similar scale to those in the surrounding area, the future baseline conditions would be worse and the reduction in daylight and sunlight as a result of the completed Development Scenario 2 would not be as pronounced as reported in this assessment.

Sunlight

16.237. Given the relatively high level of compliance for such a dense urban area, no mitigation beyond the sensitive design of Development Scenario 2 would be necessary. The likely residual effects of the completed Development Scenario 2 would remain as **negligible** to 11 out of the 17 properties assessed. The likely residual effects of the completed Development Scenario 2 on sunlight at the other six properties would remain as being of **minor** to **moderate adverse significance**.

Hours in Sun

16.238. Because no mitigation measures would be required for hours in sun (overshadowing) at the nearby amenity areas the likely residual effect of the completed Development Scenario 2 would be **negligible**.

Transient Overshadowing

16.239. The likely residual effects of the completed Development Scenario 2 on transient overshadowing would be **minor adverse significance**. This is likely a result of the unusually open nature of the Site in the future baseline condition. The shadow would move quickly throughout the day, not remaining in one place for very long.

Development Scenario 3

Daylight

16.240. In regards to the completed Development Scenario 3, 95% of the rooms assessed within the neighbouring residential properties would meet the BRE Guidelines criterion for NSL. Given this high level of compliance no further mitigation measures, beyond the sensitive design of the Phoenix Place Development, would be necessary. Therefore, the likely residual effect of Development Scenario 3 on daylight at the neighbouring residential properties would remain as **negligible** at 21 of the 26 properties assessed and of **minor** to **moderate adverse significance** at the remaining five properties.

Sunlight

16.241. Given the relatively high level of compliance (98%) for such a dense urban area, no mitigation beyond the sensitive design of Phoenix Place Development would be necessary. Therefore, the likely residual effects of Development Scenario 3 on sunlight at neighbouring residential properties would remain as **negligible** at 15 out of the 17 properties assessed and of **minor** to **moderate adverse significance** at the remaining two properties.

Hours in Sun

16.242. Because no mitigation measures would be required for hours in sun (overshadowing) at the nearby amenity areas the likely residual effect of the completed Development Scenario 3 would remain as **negligible**.

Transient Overshadowing

16.243. The likely residual effects of the completed Development Scenario 3 on transient overshadowing would be of **minor adverse significance**. This is likely a result of the unusually open nature of the Site in the future baseline condition. The shadow would move quickly throughout the day, not remaining in one place for very long.

Conclusion

16.244. The potential and likely residual daylight, sunlight and overshadowing effects resulting from each of the Development Scenarios were assessed. Table 16.14 presents a summary of the potential and likely residual effects as reported in this Chapter.

16.245. The Site in its 'future baseline' condition is uncharacteristic of the local area because it is almost completely vacant. If the Site were occupied by buildings of a similar scale to those in the surrounding area, the future baseline daylight, sunlight and overshadowing conditions would be worse. Therefore, the likely reduction in daylight and sunlight as a result of the construction and completion of the Development Scenarios would not be as pronounced as reported in this Chapter.

16.246. In addition, the BRE Guidelines were written with a suburban context in mind and it is stated within the guidelines that the advice given is not mandatory and should not be applied as an instrument of planning policy.

16.247. The BRE Guidelines state that in an urban area (such as that which surrounds the Site) the criteria should be applied more flexibly as a "*higher level of obstruction may be unavoidable if new developments are to match the height and proportion of existing buildings*".

Table 16.14: Summary of Potential and Likely Residual Effects with Regard to Daylight, Sunlight and Overshadowing

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
Demolition and Construction			
Demolition	**Negligible** in terms of daylight, sunlight and overshadowing. Potential **minor adverse effects** to those residential properties located closest to the Site	Positioning of the lighting so as to avoid the spillage of light.	**Negligible**
Construction	Daylight, sunlight and overshadowing **effects** as per completed Development Scenarios. Potential for **minor adverse** light pollution effects to those residential properties closest to the Site	None required for daylight, sunlight and overshadowing. In regards to light pollution, positioning of the lighting so as to avoid the spillage of light.	Daylight, sunlight and overshadowing effects as per completed **Development Scenarios**. Light pollution effects, **negligible**.
Completed Development			
Development Scenario 1			
Daylight	**Negligibl**e to **moderate adverse** (one instance of **substantial adverse**)	Mitigation has already been incorporated into the design; no further mitigation measures required.	**Negligible** to **moderate adverse** (one instance of **substantial adverse**)
Sunlight	**Negligible** to **moderate adverse**	Mitigation has already been incorporated into the design; no further mitigation measures required.	**Negligible** to **moderate adverse**
Hours in Sun	**Negligible**	None required.	**Negligible**
Transient Overshadowing	**Minor Adverse**	None required.	**Minor Adverse**
Development Scenario 2			
Daylight	**Negligibl**e to **moderate adverse** (one instance of **substantial adverse**)	Mitigation has already been incorporated into the design; no further mitigation measures required.	**Negligibl**e to **moderate adverse** (one instance of **substantial adverse**)
Sunlight	**Negligible** to **moderate adverse**	Mitigation has already been incorporated into the	**Negligible** to **moderate adverse**

Issue	Potential Effect	Mitigation Measures	Likely Residual Effect
		design; no further mitigation measures required	
Hours in Sun	**Negligible**	None required.	**Negligible**
Transient Overshadowing	**Minor adverse**	None required.	**Minor adverse**
Development Scenario 3			
Daylight	**Negligible** to **moderate adverse**	Mitigation has already been incorporated into the design; no further mitigation measures required.	**Negligible** to **moderate adverse**
Sunlight	**Negligible** to **moderate adverse**	Mitigation has already been incorporated into the design; no further mitigation measures required.	**Negligible** to **moderate adverse**
Hours in Sun	**Negligible**	None required	**Negligible**
Transient Overshadowing	**Minor adverse**	None required	**Minor adverse**

References

1 National Planning Policy Framework (2011)
2 Her Majesty's Stationary Office (2005): '*Clean Neighbourhood and Environment Act'*
3 Her Majesty's Stationary Office (2005): '*Environmental Protection Act'*
4 GLA (2011): *'The Camden Plan – Spatial Development Strategy for Greater London'*
5 Revised Early Minor Alterations to the London Plan (2011)
6 London Borough of Islington's Development Management Policies Submission (2012)
7 London Borough of Islington's Site Allocations Submission (2012)
8 London Borough of Islington'sFinsbury Local Plan Submission (2012)
9 London Borough of Islington's Unitary Development Policy (Saved Policies) (2002)
10 London Borough of Islington's Core Strategy (2011)
11 London Borough of Camden's Site Allocations Proposed Submission Document (2012)
12 London Boroguh of Camde's Core Strategy 2010-2025, (2010)
13 London Borough of Camden's Core Strategy 2010-2025 (2010)
14 London Borough of Camden's Development Policies, 2010-2025 (2010)
15 Mount Pleasant Supplementary Planning Document (2012)
16 London Borough of Islington's Urban Design Guide (2006)
17 Building Research Establishment (BRE) (2011): *'Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice (2011)'*
18 Commission Internationale de L'Eclairage: Guidance Noted for the Reduction of Obtrusions Light (2005)
19 British Standards Institution (BSI), (2008); BS8206-2: 2008 Lighting for buildings. Code of Practice for Daylighting.

17. Cumulative Effects

Introduction

17.1. This Chapter assesses the likely significant cumulative effects for each Development Scenario in relation to the interactions between the various environmental effects of the Development Scenarios in isolation, and the combined environmental effects of each of the Development Scenarios with those arising from other reasonably foreseeable schemes in the vicinity.

17.2. This Chapter was written by Waterman Energy, Environment & Design (Waterman EED) with input from all other consultants and specialists who have contributed to this Environmental Statement (ES). The Chapter was informed by all preceding technical chapters of this ES and ES Volume 3: *Townscape, Visual and Built Heritage Assessment*.

Assessment Methodology

17.3. The Chapter deals with two distinct types of cumulative effects:

- **Type 1 Effects:** The combination of individual effects resultant from the Development Scenarios upon a set of defined sensitive receptors, e.g. noise, dust and visual intrusion. Such effects would occur primarily during the demolition and construction of the Development. Type 1 effects have been assessed using the findings of all technical assessments included within this ES and based on professional judgement; and
- **Type 2 Effects:** The combined effects arising from other "*…reasonably foreseeable…*" schemes, which individually may be insignificant but, when assessed in combination with effects arising from the Development Scenarios, could create a significant cumulative effect.

17.4. The methodology for the assessment of Type 2 effects is set out in Chapter 2: *EIA Methodology* and was agreed as part of the EIA Scoping process with London Borough of Islington (LBI) and London Borough of Camden (LBC).

17.5. With reference to Chapter 2: *EIA Methodology*, in determining those schemes to be considered in the cumulative assessment, consideration has been given to the following:

- Their distance from the Site;
- The planning status (i.e. schemes with a valid planning permission or a resolution to grant planning permission);
- The proposed use and scale of the development; and
- The proposed floor area of the development or uplift in floor area.

17.6. Those schemes with a valid planning permission or with a resolution to grant planning permission that are within 1km of the Site, where there would be a net change in floorspace of more than 10,000m^2 Gross External Area (GEA) are considered to have the potential to give rise to significant cumulative effects and were therefore included in the assessment.

17.7. In addition, consideration was given to smaller schemes which, owing to their proximity to the Site, could give rise to significant cumulative effects, and may introduce new sensitive receptors.

17.8. In conjunction with the Applicant's planning consultant (DP9), a review was undertaken of schemes based on the above criteria. These were issued for LBI and LBC comment and agreement. A summary of the final agreed list of 'cumulative schemes' is provided below. Their locations and a detailed description of each scheme is shown within Figure 17.1 and Appendix 17.1 respectively.

Summary of Cumulative Schemes

Site of former Charter House (also known as Caxton House) 2 Farringdon Road and Units 501-521 London Central Markets, Gate 30, 45 Charterhouse Street (Planning Ref: P120484)

17.9. This scheme is located approximately 865m to the south of the Site and would involve the erection of an 11 storey over basement building comprising four Class A1 (retail) units at ground floor level and 15,395m^2 GEA of Class B1 (office) above, plus ancillary facilities including provision for basement level servicing.

Farringdon Station (Crossrail) / Thameslink at Farringdon Station (Planning Refs: 09/00412/XRAIL, 10/00626/XRAIL and P/11/1453)

17.10. This scheme is located approximately 370m to the south-east of the Site and would involve demolition, advanced and enabling works, and construction of a new surface structure up to three storeys in height and all other works associated with a new station at Farringdon.

29 to 39 Mount Pleasant and 5 Rosebery Avenue (Planning Refs: P121605 and P121606)

17.11. This scheme is located approximately 160m to the south of the Site and involves part demolition, refurbishment and erection of a part one and part two storey roof extension and new mezzanine floor level for use as Class B1 (office) floor space at 29 – 29 Mount Pleasant. It also includes change of use and refurbishment of part of the buildings including 5 Rosebery Avenue, to provide a Class A1 (retail) unit and 7 no Class C3 (residential) dwellings and part demolition and erection of a single storey roof extension off Warner street for Class C3 (residential) floor space, as well as photovoltaic panels solar thermal panels plant and associated works.

British Postal Museum and Archive (BPMA) (Planning Ref: 2012/1897/P)

17.12. This scheme is located approximately 85m to the west of the Site and involves change of use of the existing building from Class B1 (offices) to Class D1 (a new British Postal Museum and Archive) with ancillary bar / café facilities, erection of a two storey rear extension, three storey infill side extension, single storey side extension, installation of new windows, relocation of rooftop plant area, associated alterations to the façades and landscaping following demolition of existing rear extensions and outbuildings.

17.13. For the purposes of the cumulative assessment, the above four cumulative schemes were modelled and quantitatively assessed, where possible, with Development Scenario 1 (i.e. the Entire Development across both the Calthorpe Street site and the Phoenix Place site).

17.14. However, for the cumulative assessment with Development Scenario 2 (Calthorpe Street Development) and Development Scenario 3 (Phoenix Place Development), the results of the Development Scenario 1 cumulative assessment were used and extrapolated to identify and assess qualitatively (using professional judgement and experience) the likely significant cumulative effects associated with Development Scenarios 2 and 3. Exceptions to this approach are the air quality and noise assessments, which are inextricably linked to the traffic assessment; where trips assigned to the cumulative schemes, were already included within the traffic data used for the assessment of each Development Scenario.

Other Schemes

17.15. It is important to note that as identified within Chapter 2: *EIA Methodology*, the modernisation of the adjacent Mount Pleasant Sorting Office will be completed before any development on the Site is started. Therefore, all assessments presented in the preceding Chapters of this ES present an assessment of likely significant effects against a likely future baseline which assumes that all associated changes to the Mount Pleasant Sorting Office are completed and operational.

17.16. Details of the Mount Pleasant Sorting Office scheme are provided within Chapter 3: *Existing and Future Land Uses*. Accordingly, the cumulative assessment of completed Development effects does not account for this scheme (as this would lead to duplication of the assessment work already undertaken and presented within this ES).

Type 1 Effects

17.17. The combination of different types of effects, or effect interactions, from each of the Development Scenarios on particular receptors were only considered applicable to the demolition and construction works, and not to the occupation of the completed and operational Development Scenarios. This is because the greatest likelihood of effect interaction, and hence significant cumulative effects, would occur during the demolition and construction works. Indeed, demolition and construction effects can often be more adverse in nature (albeit on a temporary basis) than effects resulting from completed developments. This is exemplified in Chapter 10: *Air Quality* and Chapter 11: *Noise and Vibration*.

17.18. In consideration of the comprehensive range of environmental management controls and other mitigation measures committed to by the Applicant, specific to the demolition and construction works of the Development, effect interactions are considered only where likely significant residual effects of the Development Scenarios are predicted. As such, where negligible effects are predicted from the Development Scenarios during demolition and construction, these are not considered within the assessment of Type 1 effects.

17.19. In addition to the above, socio-economic demolition and construction effects are not included in the assessment of Type 1 effects. This is because the effects of additional employment and local spending during the demolition and construction works would not have the potential to interact with any other identified environmental effect. Furthermore, in relation to archaeology, although some residual adverse effects are predicted, any such effects would be localised and site-specific. As such, they would not have the potential to interact with other effects and are therefore not considered within the assessment of Type 1 effects.

17.20. Consequently, the main effect interactions during the demolition and construction works associated with the Development would likely result from:

- **Temporary, short** to **medium-term**, **local** effects of **minor** to **moderate adverse** significance on townscape, built heritage and visual receptors (refer to ES Volume 3: *Townscape, Visual and Built Heritage Assessment*);
- **Temporary, short term**, **local** effects of **negligible** to **minor adverse** significance in relation to noise and vibration generated from demolition and construction activities (refer to Chapter 10: *Noise and Vibration*); and
- **Temporary, short** to **medium-term**, **local** effects of **negligible** to **moderate adverse** significance in relation to dust emissions (refer to Chapter 10: *Air Quality*).

17.21. The potential Type 1 effects for various sensitive receptors (identified within Chapter 3: *Existing and Future Land Uses* and illustrated within Figures 3.4 and 3.5) in the vicinity of the Site are listed in Table 17.1 below. Table 17.1 also identifies the anticipated effect interactions during each of the main phases of demolition and construction. In accordance with Chapter 6: *Development Programme, Demolition and Construction*, the various demolition and construction activities are listed within ten key activities, some of which would overlap in terms of when they would be carried out. Detailed descriptions of each activity undertaken are provided within Chapter 6: *Development Programme, Demolition and Construction*.

17.22. To avoid repetition within Table 17.1, the potential sensitive receptors are grouped together according to land use.

Table 17.1: Potential Type 1 Effect Interactions during Demolition and Construction of the Development (all Scenarios)

Sensitive Receptor / Land Use	Development Scenario	Enabling Works and Demolition - Phoenix Place and Calthorpe Street (Q1-3 2015)	Sub and Superstructure of Phoenix Place (Q2 2015 – Q3 2016)	Sub and Superstructure of Calthorpe Street (Q2 2016 – Q1 2018)	Fit-Out of Phoenix Place (Q2 2016 – Q4 2017)	Fit-Out of Calthorpe Street (Q1 2017 – Q4 2019)	Landscaping and External Works of Phoenix Place (Q1 - Q3 2017)	Landscaping and External Works of Calthorpe Street (Q1 2018 – Q4 2019)
Residential occupants of surrounding properties.	1	TBHV, N,V,D	TBHV, N, V,D	TBHV,N,V,D	(N), (D)	(N), (D)	(N), (D)	(N), (D)
	2	TBHV,NV,D	-	TBHV,NV,D	-	(N), (D)	-	(N), (D)
	3	TBHV,NV,D	TBHV,N,V,D	-	(N), (D)	-	(N), (D)	-
Future residential occupants	1	✗	✗	✗	(N)	(N)	(N), (D)	(N), (D)
	2	✗	-	✗	-	(N)	-	(N), (D)
	3	✗	✗	-	(N)	-	(N), (D)	-
Future and existing users of surrounding commercial properties and infrastructure, including: • Mount Pleasant Sorting Office; • Offices along Farringdon Road, Mount Pleasant, Rosebery Avenue, Elm Street, Gough Street, Coley Street and Gray's Inn Road (including New Printing House Square and the ITN building; • Clerkenwell Fire Station on Rosebery Avenue; • Public Houses on Calthorpe Street and Mount Pleasant and; • Holiday Inn (junction of King's Cross and Calthorpe Street).	1	TBHV, N, V,D	TBHV, N, V,D	TBHV, N, V, D	(N), (D)	(N), (D)	(N), (D)	(N), (D)
	2	TBHV, N,V,D	TBHV, N, V,D	TBHV, N, V, D	-	(N), (D)	-	(N), (D)
	3	TBHV, N, V,D	TBHV, N, V, D	TBHV, N, V, D	(N), (D)	-	(N), (D)	-

Sensitive Receptor / Land Use	Development Scenario	Enabling Works and Demolition - Phoenix Place and Calthorpe Street (Q1-3 2015)	Sub and Superstructure of Phoenix Place (Q2 2015 – Q3 2016)	Sub and Superstructure of Calthorpe Street (Q2 2016 – Q1 2018)	Fit-Out of Phoenix Place (Q2 2016 – Q4 2017)	Fit-Out of Calthorpe Street (Q1 2017 – Q4 2019)	Landscaping and External Works of Phoenix Place (Q1 - Q3 2017)	Landscaping and External Works of Calthorpe Street (Q1 2018 – Q4 2019)
Existing and future pedestrians and road users.	1	TBHV, N, V,D	TBHV, N, V, D	TBHV, N, V, D	(N), (D)	(N), (D)	(N), (D)	(N), (D)
	2	TBHV, N, V,D	-	TBHV, N, V, D	-	(N), (D)	-	(N), (D)
	3	TBHV, N, V,D	TBHV, N, V, D	-	(N), (D)	-	(N), (D)	-

Notes:

TBHV - ***Temporary***, ***short*** *to* ***medium-term***, ***local*** *effects of* ***minor*** *to* ***moderate adverse*** *significance on townscape, built heritage and visual receptors.*

N - ***Temporary***, ***short-term***, ***local*** *effects of* ***negligible*** *to* ***minor adverse*** *significance in relation to noise generated from demolition and construction activities.*

V - ***Temporary***, ***short-term***, ***local*** *effects of* ***negligible*** *to* ***minor adverse*** *significance in relation to vibration generated from demolition and construction activities.*

D - ***Temporary***, ***short*** *to* ***medium-term***, ***local*** *effects of* ***negligible*** *to* ***minor adverse*** *significance in relation to demolition and construction derived dust and emissions from construction vehicles.*

( ) – Very minor effects.

✗ - No effects.

- Not applicable to Development Scenario

Type 2 Effects

17.23. As for Type 1 effects, only residual Type 2 effects (i.e. assuming all committed mitigation measures have been implemented) are assessed. In all cases it is assumed that the other schemes considered in the cumulative assessment would have their own site-specific Construction Environmental Management Plans (CEMPs) in order to manage and minimise the potential adverse environmental effects of demolition and construction works (refer to Chapter 6: *Development Programme, Demolition and Construction*).

17.24. Where construction programmes and completion dates for the cumulative schemes are not known, for the purposes of the assessment, it is assumed that some may overlap with the Development as a worst case.

Cumulative Impact Assessment

Waste Management

Demolition and Construction

17.25. Since April 2008, under SI 314, the Site Waste Management Plans (SWMPs) Regulations[1], has made the preparation and implementation of SWMPs mandatory for all construction projects with a capital value exceeding £300,000 (refer to Chapter 7: *Waste Management*). Therefore, it is assumed that SWMPs would be implemented on all the cumulative scheme sites to facilitate the reuse and recycling of waste. As such, a significant proportion of inert demolition and construction materials would be diverted from landfill in accordance with the waste hierarchy, where feasible, and failing which, would be disposed of in accordance with relevant legislation. Any hazardous waste would also be disposed of in accordance with current legislation. The cumulative effect of the Development and the cumulative schemes is therefore assessed as being **temporary, adverse** and of **minor significance**.

Completed Development

17.26. Although each of the Development Scenarios in conjunction with the cumulative schemes would increase waste generation within LBI and LBC, it is assumed that (similar to the three Development Scenarios) the cumulative schemes would be designed to include sufficient storage to enable segregation of recyclable and general waste and therefore meet national waste targets.

17.27. It is also anticipated that LBI and LBC would ensure sufficient waste management facilities are available within the cumulative schemes to recycle or dispose of municipal waste. Consequently, the likely cumulative effects in relation to waste would be **adverse** and of **minor significance**.

Socio-Economics

Demolition and Construction

Employment

Development Scenarios 1, 2 and 3

17.28. The demolition and construction works associated with the cumulative schemes would generate temporary employment and spending in the local area.

17.29. It is estimated that Development Scenario 1 would generate 514 full-time equivalent (FTE) jobs per year and £373,000 in local spending per year during the demolition and construction phases. Development Scenario 2 would generate 344 full-time equivalent (FTE) jobs per year and £250,000 in local spending per year, whilst Development Scenario 3 would generate 480 full-time equivalent (FTE) jobs per year and £349,000 in local spending per year.

17.30. Having examined the available documentation from the cumulative scheme planning applications, there is insufficient information to be able to directly quantify or report on the construction employment or local spending that would be generated by the cumulative schemes. However, indicative employment and local spending estimates can be provided. The new Crossrail station at Farringdon was reported at the time of appointment of contractors to cost approximately £220 million which is equivalent to 2,400 job years. Assuming a construction period of 4 years, this would amount to an average of up to 600 FTE jobs per year.

17.31. The former Caxton House development involves the construction of approximately 18,000m^2 (NIA) of commercial floorspace which is close to a third of the total floorspace of the Development Scenario 1 proposals. Assuming deconstruction and construction duration of 3 years, this development therefore has the potential to create an average of up to 300 FTE jobs per year.

17.32. The BPMA would involve the construction of approximately 2,300m^2 of D1 use floorspace. The 29 - 39 Mount Pleasant and 5 Rosebery Avenue development would involve part demolition of the existing building, construction of a single storey roof extension for residential floorspace, renovation of the existing floorspace and conversion of some existing office floorspace to 7 residential units. Assuming a two year demolition and construction / renovation programme for each, these developments combined have the potential to create up to 100 FTE jobs per year.

17.33. The cumulative schemes, when combined with the Development at Mount Pleasant, therefore have the potential to generate up to (i.e. assuming Development Scenario 1) 1,743 temporary construction jobs per year, although it is anticipated that the schemes will not all be active for the same period and duration. In addition, temporary local spending associated with the additional construction workers would contribute up to £1.15 million to the local economy. On that basis the cumulative effects of temporary demolition and construction jobs and temporary spending would be **beneficial** and of up to **moderate significance** at the local and district levels, and **beneficial** and of up to **minor significance** at the **regional level**.

Completed Development

Employment

Development Scenarios 1, 2 and 3

17.34. The cumulative schemes comprise developments with commercial and residential floorspace, with the former Caxton House at 501–521 Charterhouse Street generating the largest employment gain amongst the cumulative schemes. Because the existing Caxton House is vacant and has no tenants, there would be a net gain of 1,432 (FTE) jobs for the local area.

17.35. According to the BPMA planning application documents, there is currently 38 staff employed in the existing building, whilst the new proposals would provide employment for 50 employees, resulting in a net employment gain of 12 jobs.

17.36. The 29–39 Mount Pleasant and 5 Rosebery Avenue development is currently occupied, although existing employment is not known. The 4 buildings comprising the site have been amalgamated into one building, providing B1 office accommodation that is deemed to be of poor quality. One purpose of the development is to upgrade and renovate the existing floorspace; allowing more employees to occupy the same space. Given the negligible change in floorspace, it is not anticipated that there would be a significant change in employment at the site.

17.37. The Crossrail station at Farringdon will provide major benefits for the local area in terms of improving transport accessibility and expanding capacity at the existing station. Railway stations have a *Sui Generis* land use. No details are provided in the planning statement regarding employment, although it is estimated that up to 20 additional staff will be required once the Crossrail station is operational.

17.38. The proposals for Development Scenario 1 (the Entire Development) would likely create 309 FTE jobs, whilst Development Scenarios 2 and 3 would generate 274 and 36 FTE jobs respectively (note: total jobs combining Development Scenarios 2 and 3 differ from Development Scenario 1 due to rounding up).

17.39. On the basis of the above, it is anticipated that the cumulative schemes in combination with the Development Scenarios would provide up to (i.e. assuming Development Scenario 1) 1,775 FTE jobs. As all of the Development Scenarios represent a relatively small percentage of the total cumulative employment generated, the significance of the cumulative effects associated with each Development Scenario would be the same. Having regard to the above factors, the likely cumulative effect in terms of net employment gain would be of **moderate beneficial** significance at the **local** and **district** level, and **minor beneficial** at the **regional level**.

Local Spending

Development Scenarios 1, 2 and 3

17.40. The additional employment generated by the cumulative schemes, in combination with the Development Scenarios, would give rise to spending in the local area. Assuming that 60% of the additional workforce created spends an average of £6 a day in the local area, it is estimated that local spending associated with potential employment generation would comprise up to (i.e. assuming Development Scenario 1) approximately £1.4 million per year.

17.41. The increase in local spending associated with additional employment created by the cumulative schemes in combination with the proposed Development Scenarios would likely have a **moderate beneficial** effect at the local level and a **negligible** effect at the **district** and **regional levels**.

Demand on Housing, Education, Health, Leisure and Community Facilities and Open Space

Development Scenarios 1, 2 and 3

17.42. In addition to the proposed Development Scenarios, the 29–39 Mount Pleasant and 5 Rosebery Avenue proposals also incorporate residential floorspace. Development Scenario 1 would incorporate 681 housing units, resulting in an estimated population of 1,202 people, including 162 children. Development Scenario 2 would provide 336 residential units and an estimated population of 598 people, including 81 children, whilst Development Scenario 3 would provide 345 units and estimated population of 604 people, including 81 children.

17.43. The 29–39 Mount Pleasant and 5 Rosebery Avenue development proposals would provide 7 open market residential units. Using the same methodology as for the above Development Scenarios, this would result in an estimated resident population of 13 and up to 2 children between the ages of 0 and 15.

17.44. Taking into account the above, the likely cumulative effects of each Development Scenario in combination with the 29-39 Mount Pleasant and 5 Rosebery Avenue proposals in relation to housing, education, health, leisure and community facilities and open space are as follows:

- The additional housing would have a long-term, local to district cumulative effect of **moderate beneficial** significance and would be **negligible** at the **regional level**.
- New residents aged 0 to 4 would place pressure on existing local childcare and early years' educational services. This would have a cumulative effect of **moderate adverse** significance at the local level and **negligible** at the **district and regional levels**.
- Due to the adequate supply of primary and secondary school places in the local area, new residents would have a **negligible** cumulative effect on the provision of primary and secondary level educational services at the **local level**.
- New residents would put pressure on local GP services such that the effect on local healthcare facilities would be long-term, **minor adverse** in significance at the local level and **negligible** at the **district and regional levels**.
- Given the range of leisure and community facilities currently available, the cumulative effect of increases in local population would be **negligible** in terms of demand on available facilities.
- The provision of open space and play space within all Development Scenarios would exceed the minimum requirements and would represent a genuine benefit for the local community. The 29–39 Mt Pleasant and 5 Rosebery Avenue development does not provide open space within its proposal. The cumulative effect would therefore remain unchanged from that predicted for each of the Development Scenarios in isolation, i.e. long-term and of **minor beneficial** significance at the **local level** and **negligible** at the **district and regional levels**.

Transportation and Access

Demolition and Construction

17.45. A detailed quantitative assessment of the cumulative effects of demolition and construction HGV flows on the local highway network has not been undertaken. It can, however, be reasonably assumed that the cumulative schemes would adopt similar mitigation measures and controls to those set out for the Development Scenarios in Chapter 6: *Development Programme, Demolition and Construction* within CEMPs and Construction Traffic Management Plans, including 'just in time' deliveries, avoiding peak hour travel and unloading of vehicles on-Site wherever possible. These measures are standard best practice; therefore, on the assumption that they would be enforced at the cumulative schemes, no more than temporary **minor adverse** cumulative effects would be likely in the event that demolition and construction works overlap.

Completed Development

17.46. As set out in Chapter 9: *Transportation and Access,* future baseline traffic data used in the assessment of predicted effects for the three Development Scenarios include committed schemes. Furthermore, none of the cumulative schemes are considered likely to have any significant effects on the traffic flows on the roads surrounding the Site, either individually or in combination. The assessment of likely residual effects reported in Chapter 9: *Transportation and Access* can therefore be seen as representing a cumulative assessment. Accordingly, it is assessed that any cumulative increase in traffic as a result of all four cumulative schemes in combination with the Development Scenarios would be **negligible**.

17.47. In terms of other potential transport and access related effects, it is expected that pedestrian and cyclist permeability, as well as access to public transport, would improve overall as a result of the cumulative schemes; particularly with regards to the improvements proposed to Farringdon Station. In this regard, local cumulative effects of **minor beneficial** significance overall would be likely. In relation to access for servicing and car parking, on the assumption that the cumulative schemes also include appropriate allowances within their design in accordance with relevant policy and guidance, **no cumulative effects** are predicted.

Noise and Vibration

Demolition and Construction

Noise

17.48. In relation to the cumulative schemes considered in this assessment, only the 29-39 Mount Pleasant and 5 Rosebery Avenue and BPMA schemes are considered to be sufficiently close to the Site to have the potential to generate significant cumulative noise or vibration effects from demolition and construction. All other cumulative schemes are therefore not considered within this assessment.

17.49. Considered in isolation and due to the scale and nature of proposals, the construction works associated with the cumulative schemes would be expected to give rise to noise effects of less significance than for the Development Scenarios in isolation. However, considered cumulatively with the Development Scenarios, receptors close to the cumulative schemes and the Site may be subject to **short-term**, **local** cumulative noise effects, of no more than **minor adverse** significance, in the event that works overlap. Such effects would, however, be controlled through appropriate measures to limit noise within site-specific CEMPs for the duration of works at each scheme, in accordance with best practice.

Vibration

17.50. Owing to the scale and nature of the cumulative schemes considered, it is anticipated that construction vibration would not be a significant issue arising from works at each site. As such, **negligible** cumulative effects from vibration would be likely, although temporary vibration effects at receptors closest to the Site could occur for the Development Scenarios in isolation.

Completed Development

Noise from Fixed Plant

17.51. The cumulative schemes at 29-39 Mount Pleasant and 5 Rosebery Avenue and the BPMA are considered sufficiently close to the Development Scenarios such that cumulative noise effects from fixed plant could occur. Other cumulative schemes are considered to be located sufficiently distant from the Site that they would not give rise to any cumulative noise effects from the operation of fixed plant.

17.52. In order to prevent noise effects, it is expected that, as for the Development Scenarios, all plant within the cumulative schemes would be appropriately specified in terms of their noise output in order to meet environmental noise limits. Such limits would be agreed with LBI and LBC and would be set relative to the lowest measured background noise levels. As such, in terms of noise from fixed plant, the likely effects of the cumulative schemes with the Development Scenarios would be **negligible**.

Road Traffic Noise

17.53. As described earlier in this Chapter, and in Chapter 9: *Transportation and Access*, the future baseline traffic data take account of the traffic related to all cumulative schemes. Therefore, the assessment of road traffic noise for the Development Scenarios includes the consideration of traffic related to the cumulative schemes in the surrounding area, and therefore comprises a cumulative effect assessment in this regard. Predicted cumulative noise effects would therefore be equivalent to the likely residual effects described within Chapter 10: *Noise and Vibration*.

Vibration

17.54. As per the proposed Development Scenarios, none of the cumulative schemes would give rise to significant sources of vibration during their operation. The likely cumulative effect on ambient vibration levels would therefore be **negligible**.

Air Quality

Demolition and Construction

17.55. There is the potential for cumulative effects to result from demolition and construction of the Development Scenarios and the demolition and construction of all relevant cumulative schemes, if the construction programmes overlap and / or the schemes are close to the Site. The potential for cumulative effects would be reduced through the implementation of best practice mitigation measures because it has been assumed that site-specific CEMPs would be implemented during the construction of the cumulative schemes, similar to that proposed for the Development Scenarios.

17.56. The main potential effects on air quality during the demolition and construction of the Development Scenarios and the cumulative schemes are in relation to dust. Assuming mitigation measures are in place at all relevant schemes, it is considered that the potential for dust to create cumulative effects would only likely be an issue for the closest schemes, i.e. those within 100m of the Site and within 100m of sensitive receptors, if they were to be constructed at the same time.

17.57. The BPMA redevelopment is the only scheme located within 100m of the Site boundary and therefore has the potential to generate cumulative effects in the event of works occurring at the same time as those for the Development Scenarios at dust sensitive receptors located within 100m of both the Site boundary and this scheme. Accounting for mitigation, such as the implementation of appropriate site-specific CEMPs, the worst-case air quality cumulative effects that would arise if the Development Scenarios and the BPMA are constructed at the same time would be **temporary**, **short** to **medium-term, adverse** and of **minor significance**.

17.58. The combined construction and demolition traffic of all cumulative schemes could cause cumulative local air quality effects. In the 'worst case' scenario, whereby the cumulative schemes are constructed at the same time, and the cumulative sites use the same construction traffic routes, there could be **short** to **medium-term, local** effects of **minor adverse** significance. However, in such an event it is expected that construction traffic routes would be agreed with LBI and LBC and thus could be re-routed, where required, to avoid potential adverse effects.

Completed Development

17.59. As described earlier in this Chapter, and in Chapter 9: *Transportation and Access*, the future baseline traffic data take account of the traffic related to all the cumulative schemes. Therefore, the air quality assessments for the Development Scenarios include the consideration of traffic related to the cumulative schemes in the surrounding area, and therefore comprise a cumulative effect assessment in this regard. Predicted cumulative effects on air quality would therefore be equivalent to the residual effects described within Chapter 11: *Air Quality*.

Archaeology

Demolition and Construction

17.60. The direct effects on buried heritage (archaeological) and geo-archaeological remains would be site-specific, and there would be no direct cumulative effects arising from the construction of any of the cumulative schemes. However, cumulatively, they would result in a reduction in buried heritage (archaeological) resources and geo-archaeological remains remaining in-situ in the wider area, thus potentially limiting the scope for future research in this area.

17.61. All cumulative schemes would be subject to mitigation measures similar to those proposed for the Development Scenarios. These would be likely to include site-specific CEMPs and targeted archaeological investigations, including geo-archaeological surveys and sampling, localised excavation, and / or archaeological watching brief investigations, where required.

17.62. The expected cumulative effects in relation to each of the Development Scenarios from demolition of buildings on buried heritage assets would therefore be **negligible** to **permanent**, **long term**, **local**, **adverse** of **minor significance** for heritage assets of low and medium value.

17.63. The likely cumulative effects in relation to each of the Development Scenarios from excavations and new foundations on buried heritage assets would therefore be **permanent, long term, local**, **adverse** of **minor significance** for heritage assets of low value and would be **permanent**, **long term**, **local**, **adverse** of **moderate significance** for heritage assets of medium value.

Completed Development

17.64. There would be no intrusive groundworks associated with the operation of any of the completed cumulative schemes or the Development Scenarios. Therefore, there would be **no cumulative effects** on the archaeological interest of heritage assets.

Ground Conditions and Contamination

Demolition and Construction

17.65. Effects relating to soils and ground conditions are site-specific. In addition, the Development Scenarios would implement, where necessary, appropriate mitigation measures during the demolition and construction works according with current legislative and best practice requirements in order to not cause significant harm to human health or the environment, including water resources. The principles of these measures are set out within Chapter 13: *Ground Conditions and Contamination*. Consequently, there would be **no cumulative effects** from the proposed Development Scenarios in combination with any of the cumulative schemes.

Completed Development

17.66. The nature of the completed schemes within the vicinity of the Site is such that they would be unlikely to be significant sources of contamination. In addition, it is anticipated that appropriate measures would be put in place to prevent the contamination of soils and groundwater from any hazardous materials stored at these sites, as required by legislation and best practice. The cumulative effect of the completed Development Scenarios with the completed cumulative schemes upon ground conditions and contamination would therefore be **negligible**.

Surface Water Drainage and Flood Risk

Demolition and Construction

17.67. Water resources and flood risk effects associated with construction are typically site-specific. Consequently, it is likely that there would be no cumulative interaction between the proposed Development Scenarios and the cumulative schemes in this regard. The likely residual cumulative effects from tidal and fluvial flood risk, surface water flood risk, groundwater flood risk, foul water flood risk and an increased demand in water supply are therefore anticipated to be as for the Development Scenarios in isolation, resulting in a **negligible** cumulative effect.

Completed Development

17.68. In accordance with the National Planning Policy Framework, associated technical guidance and the requirements of the Environment Agency, it is assumed that measures would be implemented for the cumulative schemes, where necessary, so as not to increase flood risk on their sites and elsewhere. As for the Development Scenarios, this would mean that each cumulative scheme in isolation and together, would not result in any increased risk as a result of surface water runoff, and would as a minimum provide attenuation to account for climate change. The cumulative effects of the Development Scenarios and the cumulative schemes on flood risk would therefore be **negligible** to **long term**, **local level** effects of **minor beneficial** significance.

Wind

17.70. In order to assess likely cumulative wind effects, the wind tunnel test for Development Scenario 1 was re-run to include those cumulative schemes with the potential to influence predicted conditions, owing to their proximity to the Site. As such, the 29-39 Mount Pleasant and 5 Rosebery Avenue proposals, along with the BPMA scheme, were included. Cumulative effects for Development Scenarios 2 and 3 were assessed using professional judgement, taking into account the results from wind tunnel tests of the Scenarios in isolation, as reported in Chapter 15: *Wind*.

Demolition and Construction

17.71. The effect of the cumulative schemes on all Development Scenarios during demolition and construction would be **negligible**; which means that the wind microclimate would be unchanged and conditions would remain suitable for the pedestrian use of the Site and surroundings.

Completed Development

17.72. Figures 17.2 to 17.5 illustrate the cumulative results for Development Scenario 1 during both the winter (worst case) and summer seasons. Conditions across the Site are shown to range from sitting to leisure walking in winter, and from standing / entrance to sitting during summer. The results are discussed further below in relation to specific locations within Development Scenario 1.

Development Scenario 1

Building Entrances

17.73. In the vicinity of entrances, the wind environment at all receptors, taking into account the cumulative schemes, would be suitable for standing / entrance use or sitting. Overall therefore, the wind microclimate at all entrance receptors would be suitable for their intended use, which represents a cumulative effect that is **negligible** to **beneficial** and of **minor** significance.

Thoroughfares

17.74. Conditions suitable for leisure walking, or calmer, would be experienced at all receptors across the three Development Scenarios. Therefore, on public thoroughfares the predicted cumulative effect would be **negligible** to **beneficial** and of **moderate** significance.

Ground Level Amenity Spaces

17.75. Within public amenity spaces, sitting conditions are desired during summer. For Development Scenario 1, all receptors at ground level amenity spaces would be suitable for sitting, representing a **negligible** cumulative effect.

Podium and Terrace Level Amenity Spaces

17.76. Sitting conditions are desired during summer at the upper level amenity spaces. The wind environment at all receptors would be suitable for sitting during the summer months, which represents a likely **negligible** cumulative effect.

Strong Winds

17.77. There are no locations within Development Scenario 1, taking into account the cumulative schemes, where the wind speed is predicted to exceed B6 for more than one hour per annum.

Development Scenario 2

17.78. The potential effects for Development Scenario 2 are predicted to be the same as for Development Scenario 1, and the cumulative schemes would not alter these effects. Consequently, the cumulative effects for Development Scenario 2 would be the same as those for Development Scenario 1; ranging from **negligible** to **beneficial** and of **moderate** significance.

Development Scenario 3

17.79. The potential effects for Development Scenario 3 would likely be the same as for Development Scenario 1, and the cumulative schemes would not alter these effects. Consequently, the cumulative effects for Development Scenario 3 would be the same as those for Development Scenario 1, and range from **negligible** to **beneficial** and of **moderate significance**.

Daylight, Sunlight, Overshadowing, Light Pollution and Solar Glare

17.80. The assessment of likely daylight, sunlight and overshadowing cumulative effects has included consideration of the cumulative schemes at 29-39 Mount Pleasant and 5 Rosebery Avenue and the BPMA only. Other cumulative schemes were considered to be too distant or not sufficiently substantial in massing as to result in any alteration in daylight, sunlight and overshadowing within the nearby residential receptors.

Demolition and Construction

17.81. The magnitude of the cumulative daylight, sunlight and overshadowing effects of each of the Development Scenarios in combination with those arising from the two cumulative schemes would vary throughout their respective demolition and construction phases, depending on the level of obstruction caused; tending towards the effects arising from their completion as they are built out. The cumulative effects of the completed Development Scenarios and cumulative schemes therefore provide a 'worst case' and, accordingly, no specific assessment of cumulative effects during demolition and construction was undertaken.

Completed Development

17.82. Technical cumulative assessments were undertaken in reference to Development Scenario 1 only. However, a qualitative review of potential cumulative daylight, sunlight and overshadowing effects for Development Scenarios 2 and 3 was carried out.

Development Scenario 1 and Cumulative Schemes

Daylight

17.83. Full details of the cumulative VSC and NSL assessment are provided in Appendix 16.3 and summarised in Table 17.2

Table 17.2 Summary of Cumulative Daylight Assessment Results (Development Scenario 1)

Address	Total No. of Windows that Meet VSC Criteria* compared to future Baseline	Total No. of Rooms that meet NSL Criterion**
1-16 Charles Simmons House	14 of 28 (50%)	25 of 28 (89%)
160 & 162 Farringdon Road	8 of 23 (35%)	9 of 13 (69%)
Margery Court	10 of 10 (100%)	10 of 10 (100%)
Sherston Court	30 of 43 (70%)	17 of 36 (47%)
4-15 Attneave Street	22 of 22 (100%)	17 of 17 (100%)
114-140 Farringdon Road (even)	60 of 153 (39%)	37 of 83 (45%)
142-146 Farringdon Road	6 of 24 (25%)	1 of 24 (4%)
96-106 Farringdon Road (even)	67 of 67 (100%)	26 of 26 (100%)
43 Rosebery Avenue	20 of 20 (100%)	5 of 5 (100%)
11-23 Mount Pleasant (odd)	95 of 95 (100%)	53 of 53 (100%)
1 Rosebery Court	38 of 38 (100%)	38 of 38 (100%)
45 Mount Pleasant	12 of 12 (100%)	4 of 4 (100%)
51-53 Mount Pleasant	4 of 26 (15%)	6 of 10 (60%)
55 Mount Pleasant	1 of 10 (10%)	2 of 4 (50%)
57 Mount Pleasant	2 of 10 (20%)	2 of 4 (50%)
1-2 Mews House	9 of 13 (69%)	4 of 6 (67%)
1-51 Rosebery Square	104 of 104 (100%)	75 of 84 (89%)
1-30 Laystall Court	24 of 70 (34%)	49 of 70 (70%)
37-48 Elm Street	106 of 120 (88%)	84 of 84 (100%)
Mullen Tower	22 of 22 (100%)	22 of 22 (100%)
1-26 Churston Mansions	51 of 51 (100%)	32 of 32 (100%)
20-50 Calthorpe Street (even)	73 of 113 (65%)	88 of 100 (88%)
23-43 Calthorpe Street (odd)	79 of 80 (99%)	46 of 46 (100%)
1-3 Pakenham Street	26 of 32 (81%)	15 of 15 (100%)
45-49 Calthorpe Street (odd)	18 of 18 (100%)	11 of 12 (92%)
Union Tavern	23 of 23 (100%)	10 of 10 (100%)
Total	924 of 1,227 (75%)	688 of 836 (82%)

*Where VSC is less than 27% in the future baseline condition the Development Scenario is considered to meet the required criteria provided it retains at least 0.8 times its former value.

**Where NSL retained is at least 0.8 times its former value it is considered to meet the required criteria

17.85. The results indicate that 924 (75%) of the 1,227 windows assessed would meet the BRE Guidelines criteria for VSC, whereas 688 (82%) of the 836 rooms would meet the NSL criterion.

17.86. The cumulative assessment of daylight effects for Development Scenario 1 indicates that there would be a marginally higher level of compliance within 20-50 Calthorpe Street compared to that resulting from Development Scenario 1 in isolation. As a result of Development Scenario 1 in combination with the cumulative schemes, 73 of the 113 windows within 20-50 Calthorpe Street would meet the BRE Guidelines criteria for VSC and 88% of the 100 rooms would meet the BRE Guidelines criterion for NSL. This is likely because the BPMA would obscure the view from a few windows within 38-42 Calthorpe Street. Therefore, Development Scenario 1 would not be able to be seen from these few windows.

17.87. Overall, with the exception of 20-50 Calthorpe Street as described above, the likely cumulative daylight effects for Development Scenario 1 would be unchanged from those identified for Development Scenario 1 in isolation. As such, **negligible** cumulative effects are anticipated.

Sunlight

17.88. The likely cumulative effects of Development Scenario 1 on adjacent residential receptors were assessed, with full details of the cumulative sunlight assessment provided in Appendix 16.3 and summarised in Table 17.3 below.

Table 17.3 Summary of the Cumulative Sunlight Assessment (Development Scenario 1)

Address	Total No. of Windows that would Meet APSH Criteria
1-16 Charles Simmons House	22 of 28 (79%)
160 & 162 Farringdon Road	17 of 19 (89%)
Sherston Court	43 of 43 (100%)
4-15 Attneave Street	6 of 7 (86%)
114-140 Farringdon Road (even)	117 of 153 (76%)
142-146 Farringdon Road	24 of 24 (100%)
96-106 Farringdon Road (even)	59 of 59 (100%)
43 Rosebery Avenue	20 of 20 (100%)
1-2 Mews House	9 of 9 (100%)
1-51 Rosebery Avenue	17 of 20 (85%)
37-48 Elm Street	12 of 12 (100%)
1-26 Churston Mansions	12 of 12 (100%)
20-50 Calthorpe Street (even)	73 of 97 (75%)
23-43 Calthorpe Street (odd)	80 of 80 (100%)
1-3 Pakenham Street	11 of 12 (92%)
45-49 Calthorpe Street (odd)	18 of 18 (100%)
Union Tavern	23 of 23 (100%)
Total	563 of 636 (89%)

17.90. As shown in Table 17.3 above, a total of 636 windows were assessed for sunlight, 563 (89%) of which would meet the BRE Guidelines criteria. This demonstrates that overall, the likely cumulative sunlight effects of Development Scenario 1 would be the same as those identified for Development Scenario 1 in isolation. As such, **negligible** cumulative effects are predicted.

Hours in Sun

17.91. Full detailed results of the analysis for Development Scenario 1 are provided in Appendix 16.4 and summarised in Table 17.4 below.

Table 17.4 Summary of Cumulative Hours in Sun Assessment (Development Scenario 1)

Amenity Area	Proportion receiving at least 2 hours of sun on March 21
A (rear gardens of 1-10 Wren Street)	89.8%
B (rear gardens of 1-21 Calthorpe Street)	10.9%
C (rear gardens of 12-20 Wren Street)	94.8%
D (rear gardens of 23-43 Calthorpe Street)	68%
E (forecourt of 45-49 Calthorpe Street)	99.7%
F (rear gardens of 2-24 Calthorpe Street)	53.9%
G (rear gardens of 26-50 Calthorpe Street)	83.2%
H(rear gardens of Farringdon Road properties)	35%
I (Rosebery Avenue public square)	98.1%

17.92. Table 17.4 indicates that 7 out of the 9 amenity areas assessed would achieve BRE Guidelines compliance for hours in sun (overshadowing). Area B would not experience any alteration from the future baseline condition and Area H would not experience an alteration beyond the permissible 20% reduction criterion. This is the same as predicted for Development Scenario 1 in isolation and therefore **no cumulative effects** are predicted.

Transient Overshadowing

17.93. Full details of the transient overshadowing analysis for Development Scenario 1 are provided in Appendix 16.5 and summarised below.

December 21

17.94. According to the cumulative assessment, Development Scenario 1 would cast shadow on amenity Area E between the hours of 10:00 and 12:00 during the winter period. No shadow would be cast by Development Scenario 1 on the rear gardens of the Farringdon Road properties or on amenity Area I.

June 21

17.95. On June 21, shadow would be cast by Development Scenario 1 on Area F between 06:00 and 07:00 and on Areas G and E between 06:00 and 09:00. The shadow cast would however move quickly throughout the day and not remain in any one place for very long.

March 21

17.96. Development Scenario 1 would cast shadow on amenity Area G (the rear gardens of 26-50 Calthorpe Street) between the hours of 08:00 and 10:00. Transient shadow would also be cast on Area E between the hours of 07:00 and 09:00. However, the shadow cast would move quickly throughout the day and not remain in one place for very long.

17.97. No shadow would be cast by Development Scenario 1 on the playground of the Christopher Hatton Primary School or on the rear gardens of the Farringdon Road properties.

17.98. The likely cumulative transient overshadowing effect of Development Scenario 1 is therefore the same as for Development Scenario 1 in isolation and as such, **no cumulative effects** are predicted.

Development Scenario 2

Daylight and Sunlight

17.99. Given the relatively small nature of the cumulative schemes considered, the cumulative daylight and sunlight effects resulting from Development Scenario 2 would likely be similar to those reported for Development Scenario 2 in isolation. As such, **no cumulative effects** are predicted.

Hours in Sun

17.100. The cumulative hours in sun effects of Development Scenario 2 would likely be the same as those reported for Development Scenario 2 in isolation. As such, **no cumulative effects** are predicted.

Transient Overshadowing

17.101. Given the extent of the proposed massing within each of the cumulative schemes considered, the transient overshadowing effects would unlikely be different to those identified as resulting from Development Scenario 2 in isolation. As such, **no cumulative effects** are predicted.

Development Scenario 3

Daylight and Sunlight

17.102. Given the relatively small nature of the cumulative schemes considered, the cumulative daylight and sunlight effects resulting from Development Scenario 3 would likely be similar to those reported for Development Scenario 3 in isolation. As such, **no cumulative effects** are predicted.

Hours in Sun

17.103. The cumulative hours in sun effects of Development Scenario 3 would likely be the same as those reported for Development Scenario 3 in isolation. As such, **no cumulative effects** are predicted.

Transient Overshadowing

17.104. Given the extent of the proposed massing within each of the cumulative schemes considered, the transient overshadowing effects would unlikely be different to those identified as resulting from Development Scenario 3 in isolation. As such, **no cumulative effects** are predicted.

17.105. Given the scale and distance from the Site of the cumulative schemes, only the 29-39 Mount Pleasant and 5 Rosebery Avenue and the BPMA proposals have the potential to result in significant cumulative townscape effects. Detailed consideration of cumulative effects in relation to townscape, visual and built heritage issues is presented within Volume 3: *Townscape, Visual and Built Heritage Assessment*: a summary of which is provided below.

Demolition and Construction

17.106. The likely significant effects on townscape character, built heritage and visual amenity during demolition and construction would vary according to the nature of the construction works. Whilst a range of temporary, short term and local adverse effects are predicted for all Development Scenarios, cumulative effects during demolition and construction would be **negligible**.

Completed Development

17.107. Having considered the scale and distance from the Site of the cumulative schemes, and the effect on views where they are visible, it is concluded that cumulative effects on townscape, built heritage and visual receptors would not alter from those assessed for each Development Scenario in isolation. As such, **no cumulative effects** are predicted.

Summary and Conclusions

17.108. A range of potential cumulative effects have been identified for the three Development Scenarios. In terms of Type 1 effects, these predominantly relate to the interaction of effects to townscape, built heritage and visual factors, noise, vibration and dust. These effect interactions were considered for the demolition and construction phases of each of the Development Scenarios. Effect interactions would vary considerably in terms of duration, magnitude and location and would be perceived differently by different sensitive receptors in the vicinity of the Site.

17.109. In general, it is anticipated that all identified Type 1 effects are likely to combine during the 'major' elements of the works, namely demolition, site clearance, sub- and super-structure construction. During later stages of works such as fit out and landscaping, it is predicted that Type 1 effect interactions would be limited to minimal noise and dust intrusions on existing and future receptors on the Site and within the immediate surrounding area. In all cases, the adoption and enforcement of measures within specific CEMPs for the Development Scenarios would serve to minimise effects as far as possible.

17.110. In relation to Type 2 effects, it is clear from the assessments presented above that most of the cumulative schemes considered would have very limited cumulative effects in combination with the Development Scenarios. Indeed, in the majority of cases consideration of the cumulative schemes was deemed to result in no alteration to predicted effects for the Development Scenarios in isolation.

17.111. However, consideration of the 29 Mount Pleasant and 5 Rosebery Avenue and BPMA proposals indicates that some adverse cumulative effects, in terms of air quality (dust) and noise could arise in the event that demolition and construction works overlap. These would be temporary in nature and again controlled through measures within scheme-specific CEMPs in accordance with best practice.

17.112. Potential adverse socio-economic cumulative effects are predicted in relation to increased demand for early-years education and GP services at a local level although it is expected that, as for the Development Scenarios in isolation, such effects will be mitigated through appropriate Section 106 contributions agreed with LBI and LBC. In addition, it should also be noted that there are predicted to be significant beneficial socio-economic cumulative effects, specifically related to additional employment during demolition and construction, local spend and the provision of housing and open and play space at a local level.

References

[1] HMSO, 2008 'The Site Waste Management Plans (SWMPs) Regulations 2008 (SI 2008 No.314).

18. Summary of Likely Residual Effects

Introduction

18.1. For ease of reference, Table 18.1 below presents a summary of the likely residual effects of each of the Development Scenarios, as reported within the preceding technical Chapters (Chapters 7 to 16) of this Environmental Statement (ES) and the Townscape, Visual and Built Heritage Asset Assessment (Volume 3 of this ES). Detailed descriptions of the likely residual effects are presented in Chapters 7 to 16 and Volume 3 of this ES.

18.2. Construction Environmental Management Plans (CEMPs), as outlined in Chapter 6: *Development Programme, Demolition and Construction*, would be prepared and implemented. This is an established method of controlling and minimising environmental effects arising from demolition and construction activities, and would serve to reduce adverse environmental effects such as noise, vibration, and the risk of surface and groundwater pollution. It is anticipated that certain aspects of the CEMPs and other mitigation measures identified would be secured by appropriate planning obligations or conditions. It is anticipated that only of the mitigation measures would be required for the Enabling Works that form part of Development Scenarios 1 and 2.

Table 18.1: Summary of Likely Residual Effects

Issue	Likely Residual Effect
Waste Management – Demolition and Construction	
Development Scenario 1, 2 and 3	
Demolition and excavation waste	**Temporary, local, adverse** and of **minor significance**
Construction waste	**Temporary, local, adverse** and of **minor significance**
Waste Management – Completed Development	
Development Scenario 1, 2 and 3	
Generation of residential and commercial waste but with provision of sufficient space for the storage of recyclable waste within the scheme	**Long-term, district, adverse** and of **minor** to **moderate significance**
Socio-Economics – Demolition and Construction	
Development Scenario 1, 2 and 3	
Estimated generation of 514 temporary construction jobs per year over the 63 month demolition and construction works	**Temporary, short** to **medium-term, local** to **district, beneficial** and of **minor significance**
Estimated contribution of £373,000 of demolition and construction workforce local spend per year	**Temporary, short** to **medium-term, local, beneficial** and of **minor significance**
Socio-Economics – Completed Development	
Development Scenario 1, 2 and 3	
Generation of an estimated £9.6M and £19.7M of household spending from the new residents at the district and regional levels respectively	**Long-term**, **local** to **regional, beneficial** and of **minor significance** and **negligible** at the **regional** level
Provision of 681 new residential units	**Long-term**, **local** to **district, beneficial** and of **moderate significance**
309 jobs created at the Site	**Long-term, local** to **district, beneficial** and of **minor significance** and **negligible** at the **regional** level
Generation of an additional £245,000 in local spending per year due to the increase in employment at the Site	**Long-term, local** to **district, beneficial** and of **minor significance** and **negligible** at the **regional** level
Effect of new retail provision on designated Town centres or other local retail frontages	**Negligible**
Reduction in opportunities for crime and associated effects upon safety and wellbeing	**Long-term, local, beneficial** and of **minor significance**

Issue	Likely Residual Effect
Increased pressure on early years education provision	**Negligible**
Increased pressure on primary and secondary school education provision	**Negligible**
Increased pressure on GP services	**Negligible**
Increased pressure on dental services	**Negligible**
Increased pressure on leisure and community facilities	**Negligible**
Increased pressure on open space provision	**Long-term, local, beneficial** and of **minor significance**
Play space provision for children under 12 years of age	**Long-term, local, beneficial** and of **minor significance**
Transportation and Access – Demolition and Construction	
Development Scenario 1, 2 and 3	
Construction traffic on the local highway network	**Negligible**
Transportation and Access – Completed Development	
Development Scenario 1, 2 and 3	
Road traffic and highway capacity	**Negligible**
Pedestrian and cycle routes surrounding the Site	**Long-term**, **local, beneficial** and of **minor significance**
Addition of pedestrian and cyclist routes throughout the Site resulting in improvements to the permeability and connectivity of the Site	**Long-term**, **local, beneficial** and of **moderate significance**
Accidents and safety	**Negligible**
Additional trip generation demand on public transport capacity	**Negligible**
Access and servicing	**Negligible**
Parking provision	**Negligible**
Noise and Vibration – Demolition and Construction	
Development Scenario 1, 2 and 3	
Noise and Vibration - Development Scenarios 1, 2 and 3	**Negligible** to **short-term, adverse** and of **minor significance**
Piling vibration	**Negligible** to **short-term, adverse** and of **minor significance**

Issue	Likely Residual Effect
Noise and Vibration – Completed Development	
Development Scenario 1	
Operational road traffic noise	**Negligible** for receptors on the majority of the surrounding roads **Beneficial** and of **minor significance** on Phoenix Place **Adverse** and of **minor significance** on Gough Street
Ambient noise effects on proposed development	**Negligible**
Royal Mail vehicle noise emissions to surrounding receptors	**Negligible**
Vibration from building services plant	**Negligible**
Noise from building services plant	**Negligible**
Ambient noise effects in courtyards Noise effects on residents from use of the courtyards	**Negligible** **Negligible**
Development Scenario 2	
Operational road traffic noise	**Negligible** to **beneficial** and of **minor significance** on Phoenix Place
Ambient noise effects on Calthorpe Street Development	**Negligible**
Direct noise and vibration transfer to residential units above the basement of the Sorting Office	**Negligible**
Royal Mail vehicle noise emissions to surrounding receptors	**Negligible**
Vibration from building services plant	**Negligible**
Noise from building services plant	**Negligible**
Noise in / from courtyards	**Negligible**
Development Scenario 3	

Issue	Likely Residual Effect
Operational road traffic noise	**Negligible** to **beneficial** and of **minor significance** on Phoenix Place and **adverse** and of **minor significance** on Gough Street
Ambient noise effects on Phoenix Place Development	**Negligible**
Vibration from building services plant	**None**
Noise from building services plant	**Negligible**
Noise in / from courtyards	**Negligible**
Air Quality – Demolition and Construction	
Development Scenario 1	
Dust emissions from construction activities	**Negligible** to **temporary, local, adverse** and of **moderate significance**
Emissions from building services plant	**Negligible**
Emissions from construction vehicles	**Negligible** to **temporary, local, adverse** and of **minor significance**
Development Scenario 2	
Dust emissions from construction activities	**Negligible** to **temporary, local, adverse** and of **moderate significance**
Emissions from building services plant	**Negligible**
Emissions from construction vehicles	**Negligible** to **temporary, local, adverse** and of **minor significance**
Development Scenario 3	
Dust emissions from construction activities	**Negligible** to **temporary, local, adverse** and of **minor significance**
Emissions from building services plant	**Negligible**
Emissions from construction vehicles	**Negligible** to **temporary, local, adverse** and of **minor significance**
Air quality – completed development	

Issue	Likely Residual Effect
Development Scenario 1 and 2	
Emissions from traffic and heating plant associated with the Development Scenario 1 and 2	**NO_2: Negligible** to **adverse** and of **minor significance** **PM_{10} and $PM_{2.5}$: Negligible**
New sensitive receptors introduced to the Site	**Negligible** to **temporary, local, adverse** and of **minor significance**
Development Scenario 3	
Emissions from traffic and heating plant associated with the Development Scenario 3	**NO_2: Negligible** to **temporary, local , beneficial** and of **minor significance** **$PM_{2.5}$ and PM_{10}: Negligible**
New sensitive receptors introduced to the Site	**Negligible** to **temporary, local, adverse** and of **minor significance**
Archaeology – Demolition and Construction	
Development Scenario 1, 2 and 3	
Effects of demolition on buried archaeology (except palaeo-environmental remains)	**Negligible**
Effects of demolition on palaeo-environmental remains	**Permanent**, **long-term**, **local, adverse** and of **minor significance**
Effect of excavations and construction of the basement and foundations on buried archaeology (except palaeo-environmental remains)	**Permanent**, **long-term**, **local, adverse** and of **minor significance**
Effect of excavations and construction of the basement and foundations on palaeo-environmental remains	**Permanent**, **long-term**, **local, adverse** and of **minor significance**
Archaeology – completed development	
Development Scenario 1, 2 and 3	**None**
Ground Conditions and Contamination – Demolition and Construction	
Development Scenario 1, 2 and 3	
Effects on construction workers and the general public from contaminated ground	**Negligible**
Effects on construction workers and general public from unexploded ordnance	**Negligible**
Contamination to groundwater from piling	**Negligible**

Issue	Likely Residual Effect
Contamination to groundwater from leaching	**Negligible**
Contamination to groundwater from new sources (spillages)	**Negligible**
Integrity of the River Fleet Sewer and River Fleet Sewer Branch	**Negligible**
Effect on the water quality of River Fleet Sewer and River Fleet Sewer Branch (and indirectly on the River Thames)	**Negligible**
Ground Conditions and Contamination – Completed Development	
Development Scenario 1, 2 and 3	
Effects on construction workers and the general public from contaminated ground	**Negligible**
Effects on construction Workers and general public from unexploded ordnance	**Negligible**
Contamination to groundwater from piling	**Negligible**
Contamination to groundwater from leaching	**Negligible**
Contamination to groundwater from new sources (spillages)	**Negligible**
Integrity of the River Fleet Sewer and River Fleet Sewer Branch	**Negligible**
Effect on the water quality of the River Fleet Sewer and River Fleet Sewer Branch (and indirectly on the River Thames)	**Negligible**
Surface Water Drainage and Flood Risk – Demolition and Construction	
Development Scenarios 1, 2 and 3	
Tidal and fluvial flooding	**Negligible**
Groundwater flooding	**Negligible**
Pluvial flooding	**Negligible**
Surface Water Drainage and Flood Risk – Completed Development	
Development Scenario 1, 2 and 3	
Tidal and fluvial flooding	**Negligible**
Groundwater flooding	**Negligible**
Pluvial flooding	**Beneficial** and of **minor significance**

Issue	Likely Residual Effect
Capacity of foul water drainage	**Negligible**
Capacity of potable water supply	**Negligible**
Wind – Demolition and Construction	
Development Scenario 1, 2 and 3	
Potential for winds to blow into the open / cleared construction Site	**Negligible**
Wind – completed development	
Development Scenario 1, 2 and 3	
Thoroughfares	**Negligible** to **long-term, local, beneficial** of **moderate significance**
Building entrances	**Negligible** to **long-term, local, beneficial** of **minor significance**
Ground level amenity space	**Negligible**
Upper level amenity space	**Negligible**
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution – Demolition and Construction	
Development Scenario 1, 2 and 3	
Demolition	**Negligible**
Construction (daylight)	**Negligible** to **adverse** and of **moderate significance** (one instance of adverse and of **substantial significance**)
Construction (sunlight)	**Negligible** to **adverse** and of **moderate significance**
Construction (hours in sun - overshadowing)	**Negligible**
Construction (light pollution)	**Negligible**
Daylight, Sunlight, Overshadowing, Solar Glare and Light Pollution – Completed Development	
Development Scenario 1 and 2	
Daylight	**Negligible** to **adverse** and of **moderate significance** (one instance of adverse and of **substantial significance**)

Issue	Likely Residual Effect
Sunlight	**Negligible** to **adverse** and of **moderate significance**
Hours in sun	**Negligible**
Transient overshadowing	**Adverse** and of **minor significance**
Development Scenario 3	
Daylight	**Negligible** to **adverse** and of **moderate significance**
Sunlight	**Negligible** to **adverse** and of **moderate significance**
Hours in sun	**Negligible**
Transient overshadowing	**Adverse** and of **minor significance**
Townscape, Visual and Built Heritage – Demolition and Construction	
Development Scenario 1, 2 and 3	
Townscape	**Negligible**
Development Scenario 1 and 2	
Effect upon the Rosebery Avenue Conservation Area	**Temporary, short-term, local, adverse** and of **minor** to **moderate significance**
Effect upon the New River Conservation Area	**Temporary, short-term, local, adverse** and of **minor significance**
Development Scenario 1 and 3	
Effect upon the Hatton Garden Conservation Area	**Temporary, short-term, local, adverse** and of **minor** to **moderate significance**
Townscape Visual and Built Heritage – Completed Development	
Development Scenario 1, 2 and 3	
Effect upon existing townscape, including local conservation areas, registered landscapes, listed buildings and undesignated heritage assets close to the Site	**Negligible** to **adverse** and of **substantial significance**