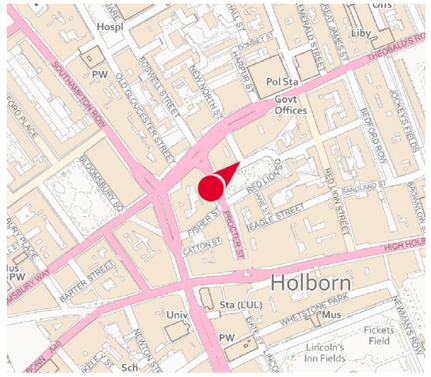
VIEW 13 – BLOOMSBURY SQUARE

Image © Miller Hare - 2024



Key Plan NTS

Existing View

This view is taken along Bloomsbury Way and is within Bloomsbury Conservation area. Bloomsbury Square is included on the National Heritage List of Historic Parks and Gardens designated at Grade II. The buildings to the east and south of Bloomsbury Square are all listed at Grade II. The Central St Martins' Lethaby Building is listed at Grade II*. The upper storey and plant room of the existing building is visible in the centre of the baseline image, although partially obscured by the mature trees on Theobalds Road.

VIEW 13 – BLOOMSBURY SQUARE

Proposed View
The proposals have been designed with the upper storey set back and the plant enclosure set back even further so that it is only partially visible. The result is a nominal change to the existing massing in this view. The proposed elevations, proposed to be re-fronted in brick with stone highlights, with a greater vertical emphasis and will respond better to the historic context. The impact on this view will be minor and beneficial.

Image © Miller Hare - 2024

VIEW 13 – BLOOMSBURY SQUARE

Cumulative
The approved scheme at Central St Martins & the Lethaby Building, will occupy a prominent position in this view. Once completed the development would obscure much of the plant room of the proposed development at no. 26 Red Lion Square.

Image © Miller Hare - 2024

2. OMITTED VIEWS

VIEW 04 – MECKLENBURGH SQUARE

Figure 1. Baseline Photograph. (Miller Hare)

Figure 2. Cumulative View (Miller Hare)

Comment on selection:
This view is taken just north of Mecklenburgh Square which is included in the National Heritage List of Historic Parks and Gardens, designated at a grade II listed. The location is also within the boundaries of the Bloomsbury Conservation Area and several Grade II listed buildings are located on the southern edge of the square.

Summary Assessment:
The proposals located at the centre of the image are obscured by the hedges growing along the north side of the square as well as by several crowns of deciduous trees in the background. We would predict that the visibility of the proposals will be extremely limited, if visible at all, in winter. The impact on this view will be neutral.

Key Plan

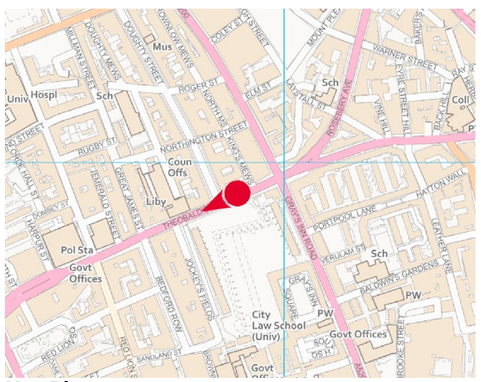
VIEW 05 – THEOBALD'S ROAD, GRAY'S INN NORTH

Figure 3. Baseline Photograph. (Miller Hare)

Figure 4. Cumulative View (Miller Hare)

Comment on selection:
This view is taken just north of Mecklenburgh Square which is included in the National Heritage List of Historic Parks and Gardens, designated at a grade II listed. The location is also within the boundaries of the Bloomsbury Conservation Area and several Grade II listed buildings are located on the southern edge of the square.

Summary Assessment:
The proposals located at the centre of the image are obscured by the hedges growing along the north side of the square as well as by several crowns of deciduous trees in the background. We would predict that the visibility of the proposals will be extremely limited, if visible at all, in winter. The impact on this view will be neutral.



Key Plan

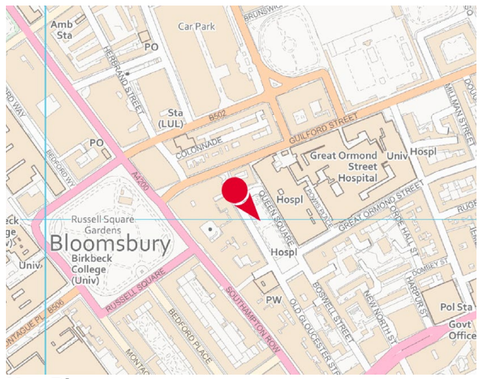
VIEW 16 – QUEENS SQUARE GARDEN, NORTH

Figure 5. Baseline Photograph. (Miller Hare)

Figure 6. Cumulative View (Miller Hare)

Comment on selection:
This view is taken just north of Mecklenburgh Square which is included in the National Heritage List of Historic Parks and Gardens, designated at a grade II listed. The location is also within the boundaries of the Bloomsbury Conservation Area and several Grade II listed buildings are located on the southern edge of the square.

Summary Assessment:
The proposals located at the centre of the image are obscured by the hedges growing along the north side of the square as well as by several crowns of deciduous trees in the background. We would predict that the visibility of the proposals will be extremely limited, if visible at all, in winter. The impact on this view will be neutral.



Key Plan

J1276 26 RED LION SQUARE

HTVIA APPENDIX A – MODEL VIEWS

December 2024

Appendix. iii
Sustainability Statement

HOARE LEA

26 Red Lion Square.
London Borough of Camden.
Railway Pension Investments Limited.

SUSTAINABILITY
SUSTAINABILITY STATEMENT

REVISION 03 – 11 DECEMBER 2024

STAGE 2

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
01	08/11/2024	Draft issued for comments	L.Tennent	M. Asimakis	T. Spurrier
02	29/11/2024	Updated for comments	L. Tennent	M.Asimakis	T.Spurrier
03	11/12/2024	Final Update for Issue	L.Tennent	M.Asimakis	T.Spurrier

Project number: 5425667
Document reference: 5425667-HLE-XX-XX-RP-ST-303085-P03_01 (Sustainability Statement).docx

Contents.

1. Executive Summary

Hoare Lea have been appointed by Railway Pension Investments Limited (the 'Applicant') to provide a summary of the sustainability certification targets and the sustainable design framework for 26 Red Lion Square, London, WC1R 4HQ (the 'Site').

1.1 The Development

"Refurbishment and recladding of existing building with extension at fourth floor adjacent to Theobalds Road and associated works"

The location of the Site is displayed in Figure 1.

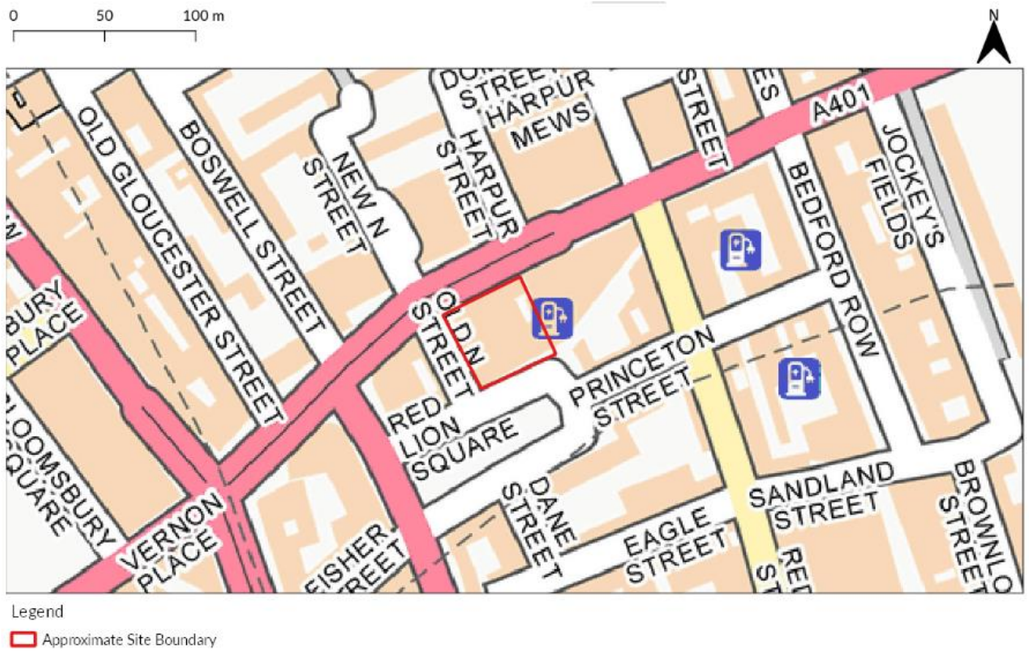


Figure 1: Approximate site boundary to indicate development location.

1.1.1 Area of Proposed Development

This report was completed using the proposed Gross Internal Area (GIA) in Table 1

Table 1: Proposed GIA of the Proposed Development

GIA	m^2
Current	13,465
Proposed	13,552

1.2 Policy and Drivers.

A policy review has been undertaken and is outlined in Section 2 of the report. As a summary, planning policy and guidance applicable to the Proposed Development includes the following:

- United Nations Sustainable Development Goals (UN SDGs)
- National Planning Policy Framework (2021)
- London Plan (March 2021)
- Camden Local Plan (2017)
- Draft Camden New Local Plan (January 2024 version)

The design of the Proposed Development is based on sustainable design and construction principles as informed by planning requirements, industry best practice, and the Applicant's own sustainability aspirations.

1.3 Climate change.

The Proposed Development will minimise greenhouse gas emissions through a balance of energy efficiency measures and the implementation of low and zero carbon technologies. The Proposed Development will provide non-combustion-based heating and cooling via air source heat pumps and four pipe Fan Coil Units (FCUs). This provides low carbon heating and cooling, without the negative impacts of combustion occurring on Site. It is a robust strategy that removes reliance on fossil fuels and instead connects to the electricity grid which benefits from UK grid decarbonisation. An energy strategy has been developed for the Proposed Development in line with the principles of the Energy Hierarchy, that is to "Be Lean", "Be Clean", "Be Green" and "Be Seen". This has been set out within the accompanying documents.

The operational energy consumption has been assessed by using a benchmarking approach in line with the CIBSE TM54 methodology.

1.4 Health & wellbeing.

The Proposed Development will seek to optimise the health and wellbeing of its occupants and visitors by seeking to achieve high levels of indoor air quality, internal daylight, thermal comfort, safety, and security. Measures to encourage physical exercise such as the provision of cycling facilities have been implemented, as well as the integration of nature throughout communal amenity spaces. Illuminance levels will be in line with current lighting design guides as a minimum. External lighting will be designed to minimise night-time light pollution whilst providing safe access to the Proposed Development

1.5 Resource use.

The Proposed Development will implement a strategy which requires all construction material has an aggregate of 20% recycled content. The demolition, excavation and construction waste of the Proposed Development will have a 95% diversion from landfill rate while the municipal waste will target a 65% recycle rate. Lean design principles have been adopted to reduce consumption of materials in the construction process. These have been detailed in the Circular Economy section of this report.

1.6 Socio-economic

The Proposed Development will adhere to the Greater London Authority's Good Work Standard in order to deliver sustainable economic development for the Site, its residents, visitors and the project owners. The development will look to use only certified ethical labour providers and look to promote the use of local small and medium sized enterprises throughout the duration of the design and construction processes and into the operation of the occupied development where possible.

The Proposed Development will be a car-free development to encourage cycling, walking and public transport. The development will include secure cycle storage for a range of bike sizes. The Main Contractor will be required to register with the Considerate Constructors Scheme and achieve a good practice score. Pre-application meetings have been undertaken to ensure engagement with the local council.

1.7 Nature and biodiversity

The Proposed Development, despite being a minor development will adhere to the Greater London Authority's requirement for major developments in the Central London Activity Area (CAZ) which states should be designed to contribute to the Mayor's target to increase green cover by 5% in this zone by 2030.

A Biodiversity Net Gain Assessment will be prepared for the Proposed Development to assess if a net gain in biodiversity units will be achieved post construction. A management plan for at least the first five years after the construction of the development is recommended to ensure the long- term success of the new habitats.

An urban greening factor of 0.3 will be targeted which meets London Plan policy requirements. The Main Contractor will be required to implement an Environmental Management System (EMS) as well as a Resource Management Plan.

1.8 Key sustainability features

The following list details the key sustainable features to be incorporated into the proposed development. Pertinent regulatory and planning policy requirements applicable to the Proposed Development have been reviewed and Section 3 of this report sets out how the Proposed Development has addressed policies with regards to sustainability.

- The scheme will target to achieve BREEAM 'Excellent' rating with aspiration for 'Outstanding'.
- The scheme will target to achieve WELL Core 'Platinum' rating.
- The scheme will target to achieve 421 Kg/CO_2/m^2 embodied carbon emissions.
- The scheme will target NABERS UK 5* Rating
- The scheme will target to achieve EPC rating A
- Adopting an all-electric services solution.
- A strategy to reduce, reuse and recycle materials in alignment with the principles of circular economy throughout design, construction and operation, minimising waste generation and the use of virgin materials.
- A waste strategy to be designed in line with the Waste Hierarchy, requiring an avoidance of waste in the first instance followed by reducing the volume that requires disposal after it has been generated. It gives an order of preference for waste management options to minimise the volume for disposal.
- All services, fabric and fittings are to meet the highest standards of sustainability adopting the principles of design for performance in operation, circular economy and whole life carbon considerations in systems and material selections.
- Whole life carbon considering both operational and embodied carbon will also be assessed and used throughout the design of the development to inform system and material specifications.
- Energy strategy following the Energy Hierarchy to reduce demand, supply energy efficiently and using renewably generated energy.

1.9 Supporting reports

The following documents have been prepared to provide further detail to this overarching Strategy:

- Energy Strategy
- BREEAM Pre-Assessment
- WELL Pre-Assessment

2. Key Drivers

2.1 National policy.

National Planning Policy Framework
The National Planning Policy Framework 2021 sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced

Part L
Approved Document (AD) Part L 2021 came into force on the 15th of June 2022. It is acting as an interim update to the Future Homes Standard (FHS) which is expected to come into full application by 2025.

Committee for Climate Change (CCC) Net Zero
The UK government's response to the IPCC report, the report introduces a strategy for decarbonising the UK to net zero emissions by 2050.

National Grid's Future Energy Scenarios (FES)
Set up by National Grid ESO, the FES team produce detailed projections on all aspects of the UK energy landscape – from heat, to transport, and energy supply, and everything in between – each year. These provide invaluable perspective on potential future decarbonisation pathways and the solutions needed to decarbonise the energy system by 2050.

Build Back Better: our Plan for Growth
Previously the UK Industrial Strategy, published in 2017, the Plan for Growth establishes the then government's strategy for leveraging industry for economic growth.

UK Environment Bill
The Environment Bill is the UK government's primary policy document for driving progress and improvements in the natural environment. There are four priority areas for the Bill: biodiversity, air quality, water and waste. All targets will be set for the mid-to-late 2030s and will be backed up with interim targets that will not be legally binding, to help spur early progress.

Public Health England Improving access to greenspace – a new review for 2020
A report discussing the importance of greenspace to health and wellbeing with a nod to the impact of the Covid-19 pandemic on people's attitudes to and appreciation of local greenspace.

2.2 Regional

GLA London Plan
The London Plan 2021 is the Spatial Development Strategy for Greater London. It sets out a framework for how London will develop over the next 20-25 years and the Mayor's vision for Good Growth. Despite the Proposed Development being a Minor Development, the Policies of the London Plan have been considered to highlight the Applicant's commitment to Energy and Sustainability. However, full compliance is not required.

Mayor's Transport Strategy
The Mayor's strategy for delivering a fairer, healthier and more prosperous city through transport.

Healthy Streets for London 2018
The basis for the Mayor's Transport Strategy, Transport for London's Healthy Streets for London presents an approach to tackle the 'inactivity crisis' to prioritise walking, cycling and public transport to create a healthy city.

London Environment Strategy
The London Environment Strategy established the Mayor's vision for London in 2050 prior to the development of the new London Plan; the six key aims are as follows:

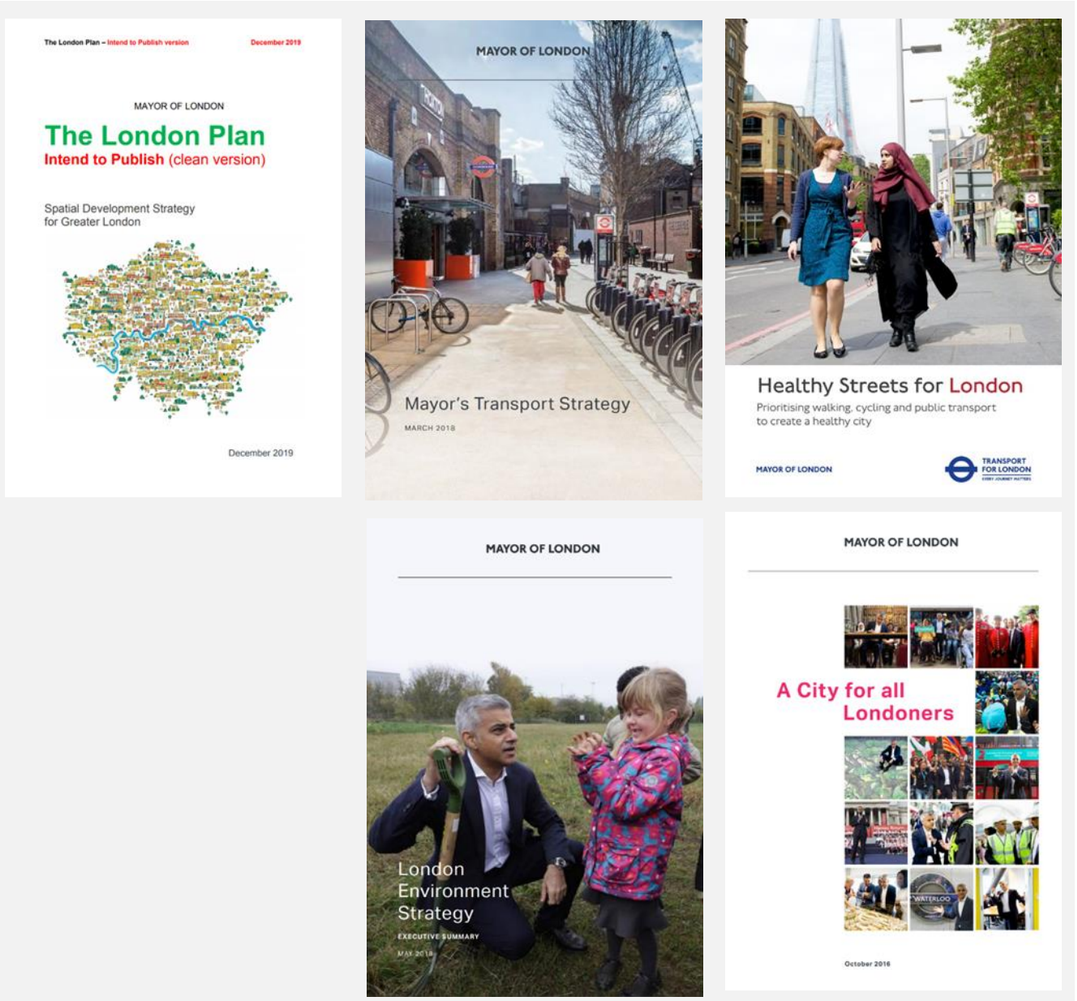
1. Climate change and energy: London will be a zero-carbon city by 2050, with energy efficient buildings, clean transport and clean energy.
2. Waste: London will be a zero-waste city. By 2026 no biodegradable or recyclable waste will be sent to landfill and by 2030 65 per cent of London's municipal waste will be recycled.
3. Adapting to climate change: London and Londoners will be resilient to severe weather and longer-term climate change impacts. This will include flooding, heat risk and drought.
4. Green infrastructure: London will be the world's first National Park City, where more than half of its area is green, where the natural environment is protected, and where the network of green infrastructure is managed to benefit all Londoners.
5. Air quality: London will have the best air quality of any major world city by 2050, going beyond the legal requirements to protect human health and minimise inequalities.
6. Noise: Londoners' quality of life will be improved by reducing the number of people adversely affected by noise and promoting more quiet and tranquil spaces.
7. Low carbon circular economy: London will transition to a low carbon society.

In addition, the three key outcomes are identified; these are a London which is:

Greener: *All Londoners should be able to enjoy the very best parks, trees and wildlife. Creating a greener city is good for everyone – it will improve people's health and quality of life, support the success of businesses and attract more visitors to London.*

Cleaner: *Londoners want their city to be clean, attractive and healthy – living in a big city does not mean they should accept a dirty and polluted environment. The Mayor will clean up London's air, water and energy in a way that is fair, protects the health of Londoners, and contributes to the fight against climate change.*

Ready for the future: *Water, energy and raw materials for the products we consume will be less readily available in the future, and climate change will mean higher temperatures, more intense rainfall and water shortages. The Mayor will make sure the city does not waste valuable resources, is prepared for the future and is safeguarded for future generations.*



City for All Londoners
Published in 2016, this report set the tone for the current Mayor's approach to responding to the challenges faced by London; namely: the pressure that a fast-growing population exerts on the city, the increasing diversity of Londoners, rising inequality, the uncertainty caused by the EU referendum result, and the effects of climate change.

Central Activities Zones SPG (2016)

The SPG provides supplementary guidance on London Plan policy for London's globally iconic core - the 'Central Activities Zone

London Plan's Sustainable Design and Construction SPG (2011)
This SPG provides guidance on what measures developers can include in their building designs and operations to achieve the carbon dioxide and water consumption targets set out in the London Plan. It also provides guidance on how boroughs can take forward the new approaches set out in the London Plan, such as carbon-dioxide off-setting, retrofitting and 'air quality neutral'.

The London Plan's Sustainable Design and Construction SPG includes guidance on:

- Energy efficient design.
- Meeting the carbon dioxide reduction targets.
- Decentralised energy.
- How to offset carbon dioxide where the targets set out in the London Plan are not met.
- Retro-fitting measures.
- Support for monitoring energy use during occupation.
- An introduction to resilience and demand side response.
- Air quality neutral.
- Resilience to flooding.
- Urban greening.
- Pollution control.
- Basements policy and developments.
- Local food growing.

'.

2.3 Local Policy

The Camden Local Plan sets out the Council's planning policies and replaces the Core Strategy and Development Policies planning documents (adopted in 2010). It ensures that Camden continues to have robust, effective and up-to-date planning policies that respond to changing circumstances and the borough's unique characteristics and contribute to delivering the Camden Plan and other local priorities. The Local Plan will cover the period from 2016-2031.

The Local Plan in particular will help deliver the objectives of creating the conditions for harnessing the benefits of economic growth, reducing inequality and securing sustainable neighbourhoods. It will also assist the delivery of other plans and strategies prepared by the Council and other service bodies, for example master plans and planning briefs.

This Local Plan is a key delivery mechanism for the Camden Plan and other Council strategies including the Joint Health and Wellbeing Strategy. Key Council objectives are to:

- Provide democratic and strategic leadership fit for changing times.
- Develop new solutions with partners to reduce inequalities and improve the physical and mental health and wellbeing of local residents.
- Create conditions for and harnessing the benefits of economic growth.
- Invest in our communities to ensure sustainable neighbourhoods.
- Deliver value for money services by getting it right first time.

Camden Planning Guidance (SPD): Energy efficiency and adaptation (2021)
The Council has prepared this Camden Planning Guidance (CPG) on Energy and resources to support the policies in the Camden Local Plan 2017. This guidance is therefore consistent with the Local Plan and forms a Supplementary Planning Document (SPD) which is an additional "material consideration" in planning decisions.

Strategic Objective - Holborn Growth Area
The development is within Holborn Growth Area. This aims to ensure that all development is supported by necessary infrastructure and maximises the opportunities and benefits for the local and surrounding communities and the borough as a whole.

Camden Local Plan (2017)

3. Policy Context Review

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	PHYSICAL		
	**Building performance** GLA London Plan 2021 Policy GG 6 – Demonstrate that the development is resilient to predicted climate conditions during the building's lifetime. – Improve energy efficiency and support the move towards a low carbon circular economy Policy SI1 – Mitigate the impacts of climate change by reducing greenhouse gas emissions in line with the 'Energy Hierarchy'. – Minimum on-site reduction of at least 35% beyond Building Regulations Part L baseline, with 15% reduction for residential sites and 10% for commercial sites achieved through energy efficiency measures on site. – Offset payment at a rate £2,850/tCO2 to be used to offset reduction to 100% beyond Building Regulations Part L baseline not achieved on site. – Minimise unregulated carbon emissions. – Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions Camden Local Plan (2017) Policy CC1 Climate change mitigation – The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation. – All developments involving five or more dwellings and/or more than 500 sqm of (gross internal) any floorspace will be required to submit an energy statement demonstrating how the energy hierarchy has been applied to make the fullest contribution to CO2 reduction. – All new residential development will also be required to demonstrate a 19% CO2 reduction below Part L 2013 Building Regulations (in addition to any requirements for renewable energy). This can be demonstrated through an energy statement or sustainability statement. Policy CC2 Adapting to Climate Change	Energy efficiency and adaptation (2021) Key Message Section 3 Natural 'passive' measures should be prioritised overactive measures to reduce energy. Major residential development to achieve 10%, and non-residential development to achieve 15% reduction (beyond part L Building regulations), in accordance with the new London Plan, through on-site energy efficient measures (Be lean stage). Key Message Section 10 All developments involving 5 or more residential units or 500 sqm or more of any additional floorspace should address sustainable design and construction measures (proposed in design and implementation) in a Sustainability Statement (Local Plan policy CC2). Active cooling (air conditioning) will only be permitted where its need is demonstrated and the steps in the cooling hierarchy are followed (Local Plan policy CC2). Development is expected to reduce overheating risk through following the steps in the cooling hierarchy. All new development should submit a statement demonstrating how the cooling hierarchy has been followed (Local Plan policy CC2). All developments should seek opportunities to make a positive contribution to green space provision or greening. Key Message Section 11 BREEAM Excellent is required for all non-residential development of 500sqm or more floorspace. Camden Planning Guidance (SPD) Energy Efficiency and Adaptation 2021 All development in Camden is expected to reduce carbon dioxide emissions by following the energy hierarchy in accordance with Local Plan policy CC1. Energy strategies are to be designed following the steps set out in the energy hierarchy Natural 'passive' measures should be prioritised overactive measures to reduce energy. Major residential development to achieve 10%, and non-residential development to achieve 15% reduction (beyond part L Building regulations), in accordance with the new London Plan, through on-site energy efficient measures (Be lean stage)	– Renewable energies: – ASHP – Photovoltaic Array – Conduct a climate change adaptation strategy appraisal for structural and fabric resistance for project climate change scenarios in line with Wst 05 requirements. – Sustainable design and construction policy drivers are outline in the Circular Economy section of this report. The carbon emissions attributed to the construction of the proposed development will be quantified and discussed within the Whole Life Carbon section of this report. – Hoare Lea have produced an Energy Statement as part of the Planning Application setting out the energy strategy for the Proposed Development. The Statement demonstrates that at the planning stage, the Applicant and the design team have given due consideration to the principles of energy and sustainability, and how these could be implemented for the Proposed Development. – The GLA energy hierarchy has been adopted for the Proposed Development. Please refer to the accompanying Energy Statement for full details.

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	– Encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve “excellent” in BREEAM domestic refurbishment. Policy T4 – The Council will promote the sustainable movement of goods and materials and seek to minimise the movement of goods and materials by road. The council aims to: – encourage the movement of goods and materials by canal, rail and bicycle where possible. – protect existing facilities for waterborne and rail freight traffic and. – promote the provision and use of freight consolidation facilities.	There are a variety of renewable energy technologies that can be installed to supplement a development’s energy needs. Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies. Energy statements are required for all developments involving 5 or more dwellings and/or more than 500sqm of any (gross internal) floorspace. Energy statements should demonstrate how a development has been designed following the steps in the energy hierarchy. The energy reductions should accord with those set out in the Chapter below ‘Energy reduction’.	
	**Energy and CO2 Emission Reduction** GLA London Plan 2021 Policy SI 2 Minimising greenhouse gas emissions – Mitigate the impacts of climate change by reducing greenhouse gas emissions in line with the ‘Energy Hierarchy’. – All new developments to be net zero-carbon. – Minimum on-site reduction of at least 35% beyond Building Regulations Part L baseline, with 15% reduction for residential sites and 10% for commercial sites achieved through energy efficiency measures on site. – Offset payment at a rate £2,850/tCO2 to be used to offset reduction to 100% beyond Building Regulations Part L baseline not achieved on site. – Minimise unregulated carbon emissions. – Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions. Policy SI 3 – Heat source for major development should follow the ‘heating hierarchy’. – Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system. – Development Plans should identify existing heating and cooling networks, identify proposed locations for future heating and cooling networks and identify opportunities for expanding and inter-connecting existing networks as well as establishing new networks. – Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system: – 1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy: – a) connect to local existing or planned heat networks	Energy efficiency and adaptation (2021) Key Message Section 2 All development in Camden is expected to reduce carbon dioxide emissions by following the energy hierarchy in accordance with Local Plan policy CC1. Energy strategies are to be designed following the steps set out in the energy hierarchy. Key Message Section 4 All new major developments in Camden are expected to assess the feasibility of decentralised energy network growth (paragraph 8.25 Local Plan/CC1). Key Message Section 5 There are a variety of renewable energy technologies that can be installed to supplement a development’s energy needs. Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies. Where space allows, panels are to meet 100% of the site's summer hot water needs, which equates to 50-60% of the annual demand. Key Message Section 6 Energy statements are required for all developments involving 5 or more dwellings and/or more than 500sqm of any (gross internal) floorspace. Energy statements should demonstrate how a development has been designed following the steps in the energy hierarchy. The energy reductions should accord with those set out in the Chapter below ‘Energy reduction’. Key Message Section 7 All development in Camden is expected to reduce carbon dioxide emissions through the application of the energy hierarchy.	– The Proposed Development prioritises an all-electric approach – Hoare Lea has conducted thermal modelling to assess the Proposed Development against the CIBSE TM52 criteria and demonstrated that the Proposed Development is compliant. – The Proposed Development followed the GLA Cooling Hierarchy in adopting measures to ensure the risk of overheating is minimised. The passive design measures to be considered in the design include: – Facades have been developed with suitable glazing-to-solid ratios, with particular focus on south facing orientations. – Suitable g-values will be specified to further control solar heat gains as required; and – Buildings will have the capability for internal blinds to be installed to improve occupant comfort. – Mechanical ventilation plant will be located away from pollution sources, typically at roof level. It is anticipated that the design flow rates specified will aid the regulation of internal temperatures in summer months. – In order to keep internal temperatures within acceptable limits. the façade and building services have been designed with a 4-pipe fan coil unit cooling solution. - Hoare Lea has completed an Energy Strategy in line with the National, Regional and Local Planning policies. The Energy Strategy incorporates passive and active measures and is targeting a 43% reduction in carbon emissions which is above and beyond the policy requirements for minor developments. - - The London Heat Map has been consulted to investigate whether an existing DH network is close proximity to the site. It has been

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	– b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required) – c) use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network) d) use ultra-low NOx gas boilers – 2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality – 3) Where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date. Policy SI 4 Managing heat risk – Follow the cooling hierarchy: – 1) Reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure – 2) Minimise internal heat generation through energy efficient design – 3) Manage the heat within the building through exposed internal thermal mass and high ceilings – 4) Provide passive ventilation – 5) Provide mechanical ventilation – 6) Provide active cooling systems. Camden Local Plan (2017) Policy CC1 Climate Change Mitigation – Minimum 20% improvement over Part L through renewables for developments >500m2 GIA – Any shortfall from net zero carbon to be made up as carbon offsets payments. Policy CC2 Adapting to Climate Change – Dynamic thermal modelling required to justify active cooling Policy CC4 – The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough. – Consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan. Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution.	All new build major development to demonstrate compliance with London Plan targets for carbon dioxide emissions. Deep refurbishments (i.e. refurbishments assessed under Building Regulations Part L1A/L2A) should also meet the London Plan carbon reduction targets for new buildings. All new build residential development (of 1 – 9 dwellings) must meet 19% carbon dioxide reduction; and Developments of five or more dwellings and/or more than 500sqm of any gross internal floorspace to achieve 20% reduction in carbon dioxide emissions from on-site renewable energy generation. Key Message Section 8 All developments should demonstrate how sustainable design principles have been considered and incorporated. Sensitive improvements can be made to historic buildings to reduce carbon dioxide emissions. The 20% carbon reduction target (using on-site renewable energy technologies) applies for developments of five or more dwellings and/or more than 500 sqm of any gross internal floorspace (see Chapters 2 and 4). Draft New Camden Local Plan (January 2024 version) Policy CC4 Minimising Carbon Emissions The Council will seek to ensure that all development minimises carbon emissions over the lifespan of the building(s). The Council will: Require applicants for all new build development and all development proposing substantial demolition to: submit a whole life carbon emissions assessment (including operational and embodied carbon), following the GLA Whole Life Cycle Carbon Assessment template, as part of the planning application; and demonstrate that they have done all they can to minimise carbon emissions over the lifespan of the building/s, targeting the GLA Whole Life Carbon aspirational benchmarks in modules B – C. Require new build developments to meet embodied carbon limits of less than 500kg CO2/m2 for residential, and less than 600kg CO2/m2 for non-residential. Require applicants to demonstrate what action they have taken to reduce embodied carbon in the development, as part of the Energy or Sustainability Statement. Policy CC5 - Energy reduction in existing buildings The Council will support adaptations and improvements to existing buildings to make them more energy efficient and reduce the energy needed to occupy the building. The Council will:	concluded that no existing DHN is in close proximity to the site, however, the development will be future-proofed so that a connection will be possible should a future DHN is made available.

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
		Require all development proposals for the alteration, extension and/or conversion of an existing building (including where an element of demolition is proposed) to demonstrate how they have considered and will implement energy efficient improvements. This should be detailed in the Sustainability Statement. Expect energy efficient improvements to be made appropriate to the scale or nature of the proposal. Expect energy demand in the part of the building being altered/ extended and/or converted, to primarily be reduced through improvements to the building fabric. These improvements should comply with the U values set out in Table 6 in the supporting text below. Require proposals that include the addition or replacement of 500sqm floorspace or more; or developments providing one or more additional dwellings through conversion and / or additional floorspace to: reduce the amount of energy required to heat the building/s over a year, as far as possible, to meet a space heating demand of 50 kwh/m2/year. Proposals within a conservation area or related to a listed building may be provided an additional allowance of 10 - 20 kWh/m2 where it is demonstrated to the Council's satisfaction that the above target of 50 kwh/m2/year cannot be met; be fossil fuel-free, and use low carbon heat; demonstrate to the Council's satisfaction that it has maximised the generation of renewable energy on-site (through solar photovoltaics (pv), as far as practical; and Submit an energy statement to demonstrate how the proposal complies with the criteria above. Encourage all other proposals for the alteration, extension and/or conversion of an existing building (not specified in A(iv)) to also meet the standards set out in A(iv) a, b, c and d above. Require proposals that include substantial demolition but retain part of the building to use as little energy as possible and meet an Energy Use Intensity target of 50 kWh/m2/year for residential uses. In instances where minimal existing built fabric is retained (i.e. basement; foundations; a façade; small part of the superstructure) the Council will require the development to meet all energy reduction criteria for new buildings set out in Policy CC6. Policy CC7 - Heat networks The Council will ensure that all major developments utilise energy from heat networks where feasible. The Council will: Require all major development to comply with London Plan policy SI3 (Energy infrastructure) and refer to related GLA Energy Assessment guidance for heat networks and utilising secondary heat sources.	

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
		Require all major development located within a 500m radius of an energy network to be designed for connection. Where a heat network exists in the vicinity of the proposed development, the applicant must prioritise connection to that network provided that the network operator has agreed a decarbonisation strategy with the GLA and Camden Council. Policy CC8 - Overheating and cooling The Council will ensure that development is designed to minimise overheating and promote cooling. The Council will: Support proposals which seek to adapt and improve existing buildings, to improve ventilation, and address overheating and promote cooling, where they are in accordance with the other policies in this Plan. Require all development to minimise the adverse impacts of overheating through the application of the London Plan cooling hierarchy. Applicants should include information demonstrating that the risk of overheating has been mitigated through the incorporation of design measures in the Sustainability Statement. Resist applications that include active cooling (air conditioning) and non-essential mechanical plant. Applications for new build development that include active cooling will only be permitted where dynamic thermal modelling demonstrates there is a clear need for it and other passive measures have been integrated into the development. Applications for existing non-residential buildings will need to demonstrate there is a clear need for additional, or replacement, active cooling equipment and that other passive measures have been integrated. Where need is demonstrated to the Council's satisfaction, the Council will also require the carbon used to operate the system to be offset through the installation of solar photovoltaics. Require applicants to incorporate measures to cool buildings through the use of materials and finishes. The Council will expect materials and finishes to have the ability to reflect sunlight. Require applicants to incorporate measures to cool the spaces around and between buildings using appropriate materials, finishes, and greening. Trees should provide adequate canopy cover for greater cooling effect.	
NATURAL			

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	**Water** GLA London Plan 2021 Policy SI 5 – Minimise the consumption of potable water targeting <105l/person/day and incorporate smart metering, water saving and recycling measures. – Achieve BREEAM credit Wat 01 Policy SI 12, – Development Plans should use the Mayor's Regional Flood Risk Appraisal and their Strategic Flood Risk Assessment as well as Local Flood Risk Management Strategies. – Natural flood management methods should be employed in development proposals due to their multiple benefits. Policy SI 13 – Aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible via green or grey attenuation features – Integrate Sustainable Urban Drainage Systems (SUDS) and other flood risk mitigation and follow the London Plan drainage hierarchy to conserve water and minimise water run-off. Policy SI 14 Proposals should take account of the emerging Marine Spatial Plans prepared by the Marine Management Organisation. Camden Local Plan (2017) Policy CC3 Water and Flooding – Developments are required to incorporate water efficiency measures. – The Council will seek to ensure that development does not increase flood risk and reduces the risk of flooding where possible. We will require development to: – Incorporate water efficiency measures; – Avoid harm to the water environment and improve water quality; – Consider the impact of development in areas at risk of flooding (including drainage); – Incorporate flood resilient measures in areas prone to flooding; – Utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible; and – Not locate vulnerable development in flood-prone areas. Where an assessment of flood risk is required, developments should consider surface water flooding in detail and groundwater flooding where applicable.	Water & Flooding CPG (2019) - The Council expects all developments, whether new or existing buildings, to be designed to be water efficient by minimising water use and maximising the re-use of water. - Normally, requirements for sustainable design and construction - including water efficiency will be dealt with using conditions, but in some circumstances, a Section 106 agreement may be required to secure an environmental assessment or a sustainability plan - Developments must not increase the risk of flooding, and are - required to put in place mitigation measures where there is known to be a risk of flooding (Local Plan policies CC2 and CC3). - Major developments will be required to constrain runoff volumes for a 1 in 100-year, 6-hour rainfall event, where feasible. - All sites in Camden of one hectare or more require a Flood Risk Assessment in line with the National Planning Policy Framework. New Camden Local Plan Policy CC9 - Water efficiency A. To maximise water efficiency in Camden the Council will: a. Require all new development to be designed to be water efficient b. Require all residential developments to meet the optional requirement for water efficiency set out in Part G of the Building Regulations of 110 litres per person per day (including 5 litres for external water use). Proposals will be strongly encouraged to reduce daily water use even further than this (to, for example, 85 litres per day per person) where possible. c. Require all new build non-residential development to achieve 'excellent' for category Wat 01 of BREEAM unless it can be demonstrated that it is not technically feasible. d. Require all new buildings to include rainwater harvesting appropriate to the scale and nature of the proposed development; and e. Require major developments and high, or intense, water use developments, such as hotels, hostels and student housing, to include a grey water system, unless it is demonstrated to the Council's satisfaction that this is not feasible or practical. Policy CC11 - Flood risk	– The Proposed Development is in Flood Zone 1. Land within this zone has a low probability of flooding from rivers and the sea. – Flood Risk Assessment will be conducted to confirm the drainage measures on the site meet the BREEAM Pol 03 requirements for surface water run-off and discharge – A climate change adaptation strategy appraisal will be conducted for structural and fabric resistance for project climate change scenarios in line with Wst 05 requirements. – Water consumption will be minimised through efficient water fittings.

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		A. The Council will seek to ensure that development addresses and reduces food risk to mitigate the impact of fooding on Camden's communities, both now and in the future. The Council will: a. Require applicants to use the borough's Strategic Flood Risk Assessment to identify whether their site is at risk of fooding from any source. Certain developments are exempted from this, and these are set out in the supporting text below. b. Require site specific food risk assessments to be submitted for: i. All sites of 1 hectare or greater. ii. All applications where food risk has been identified in accordance with criteria (i); and iii. All basement development, where food risk has been identified in accordance with criteria (i). c. Expect Flood Risk Assessments (FRA) to be prepared in accordance with the guidance set out in the Council's Strategic Flood Risk Assessment and demonstrate how a development has been designed to be resilient to fooding and set out how the risk of fooding will be mitigated over the lifetime of the development, without increasing food risk elsewhere. Recommendations in the FRA will be secured by planning condition.	
	Waste GLA London Plan 2021 Policy SI 7 – Support the circular economy by resource conservation, waste reduction and increase in material re-use and recycling. – Ensure that there is zero biodegradable or recyclable waste to landfill by 2026. – Meet or exceed the municipal waste recycling target of 65 per cent by 2030. – Meet or exceed the targets for each of the following waste and material streams: – construction and demolition - 95% reuse/recycling/recovery. – Excavation – 95% beneficial use. Policy SI 10 – Encourage the re-use and recycling of construction, demolition and excavation waste within London, including on-site.	Energy efficiency and adaptation (2021) Key Message Section 9 - We will expect creative and innovative solutions to repurposing existing buildings, and avoiding demolition where feasible; All development should seek to optimise resource efficiency and use circular economy principles. Camden Planning Guidance (SPD) Energy Efficiency and Adaptation 2021 We will expect creative and innovative solutions to repurposing existing buildings, and avoiding demolition where feasible All development should look to optimise resource efficiency and use circular economy principles.	– The Circular Economy section of this report will be completed in line with the GLA Requirements for Policy SI 7 - Reducing Waste and Supporting the Circular Economy. Please refer to the Circular Economy section of this report for further details. – A Site Waste Management Plan (SWMP) will be produced.

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	Development Plans should make provision for the maintenance of a landbank (i.e. seven years' supply) of at least five million tonnes of land-won aggregates up to 2041 Camden Local Plan (2017) Policy CC1 Climate Change Mitigation 8.17 All proposals for substantial demolition and reconstruction should be fully justified in terms of the optimisation of resources and energy use, in comparison with the existing building. Where the demolition of a building cannot be avoided, we will expect developments to divert 85% of waste from landfill and comply with the Institute for Civil Engineer's Demolition Protocol and either reuse materials on-site or salvage appropriate materials to enable their reuse off-site. We will also require developments to consider the specification of materials and construction processes with low embodied carbon content. 8.18 We will expect all developments, whether for refurbishment or redevelopment, to optimise resource efficiency by: • reducing waste; • reducing energy and water use during construction; • minimising materials required; • using materials with low embodied carbon content; and • enabling low energy and water demands once the building is in use. 8.20 As part of the assessment of resource efficiency, all developments involving more than 500 sqm gross internal floor space are encouraged to assess the embodied carbon emissions associated with the development within the energy and sustainability statement. Where such an assessment has been completed, we would encourage that the results are logged on the WRAP embodied carbon database in order to contribute to the embodied carbon knowledge base Policy CC5 Waste Facilities for storage and collection 8.97 To make sure that residents and businesses can properly store and sort their waste and to make recycling as easy as possible, the Council will require developments to provide adequate facilities for recycling and the storage and disposal of waste. Facilities for composting will be encouraged in appropriate development schemes. We will also seek to secure the reuse of construction waste on development sites to reduce resource use and the need to transport materials. Our supplementary planning document Camden Planning Guidance on design contains further information on the Council's expectations for on-site facilities for waste and recycling and on construction waste.		

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	**Biodiversity** GLA London Plan 2021 Policy G1 – Incorporate appropriate elements of green infrastructure that are integrated into London's wider green infrastructure network. – A London's network of green and open spaces, and green features in the built environment, should be protected and enhanced. Green infrastructure should be planned, designed, and managed in an integrated way to achieve multiple benefits. Policy G5 – Achieve an Urban Greening Factor (UGF) of 0.4 for residential sites and 0.3 for commercial developments. – Existing green cover retained on site should count towards developments meeting the interim target scores. – Major development proposals should contribute to the greening of London by including urban greening as a fundamental element of site and building design, and by incorporating measures such as high-quality landscaping (including trees), green roofs, green walls and nature-based sustainable drainage. – Boroughs should develop an Urban Greening Factor (UGF) to find the appropriate amount of urban greening required in new developments. The UGF should be based on the factors set out in Table 8.2 but tailored to local circumstances. In the interim, the Mayor recommends a target score of 0.4 for developments that are predominately residential, and a target score of 0.3 for predominately commercial development (excluding B2 and B8 uses). Policy G6 – Achieve a net gain in biodiversity, protect existing habitats on site whilst protecting existing ecological features. – Establish clear goals for the management of identified sites to promote public access, appreciation, and interpretation of geodiversity. Policy G7 Trees and woodlands – Existing trees should be protected and replaced if removed. – Developments should protect 'veteran' trees. – Opportunities to plant new trees should be identified. Camden Local Plan (2017) Policy A2 Open space Protect all designated public and private open spaces as shown on the Policies Map and in the accompanying schedule unless equivalent or better provision of open space in terms of quality and quantity is provided within the local catchment area. Policy A3 Biodiversity Trees and vegetation The Council will protect, and seek to secure additional, trees and vegetation.	New Camden Local Plan (2024) Policy NE2 - Biodiversity A. The Council will seek to ensure that development protects and enhances nature conservation and biodiversity in the Borough. The Council will: i. Safeguard protected and priority habitats and species, Sites of Importance for Nature Conservation (SINC) and other features of biodiversity value such as wildlife corridors and stepping stones; ii. Require all major schemes, and those that have the potential to impact biodiversity and designated sites, to prepare a baseline ecological assessment, and demonstrate how any impacts on biodiversity can be avoided or mitigated and establish how biodiversity enhancements will be maximized. Where mitigation measures are proposed these should be delivered on-site, unless it can be demonstrated to the Council's satisfaction that this isn't achievable; iii. Address the potential of both direct and indirect impacts on habitats and species, from factors such as shading, light pollution and risk of disturbance and expect development to follow the mitigation hierarchy with regards to these impacts (avoiding impacts where possible; where this is not feasible seek to mitigate impact; and only where the impact is not capable of being avoided or mitigated, seek compensation for the loss/harm); iv. Resist development where it is likely to worsen deficiencies in access to natural greenspace; v. Expect development to realise benefits for biodiversity through their layout, design and the materials used in their built and landscaping elements, taking account of the local ecological context, strategic and local opportunities for biodiversity gains identified in the Council's Biodiversity Strategy and emerging Nature Recovery Network, neighbourhood plans and Local Plan site allocations; vi. Require biodiversity net gain of at least 10% on eligible sites, with preference given for on-site or near site solutions. The net gains will be secured for a period of at least 30 years; vii. Recognise the biodiversity value offered by gardens; viii. Seek biodiversity enhancements commensurate with the scale of proposed residential and non-residential extensions and alterations, including the provision of biodiverse green roofs and species features such as bird and bat boxes; and ix. Secure long-term management plans and monitoring of schemes, where appropriate, to ensure that nature conservation objectives are met. We will also expect Construction Management Plans to provide information on how habitats will be protected during building work, where appropriate.	– An initial ecological assessment will be completed by a suitable qualified ecologist (SQE). In line with LE 02 requirements, the SQE must confirm that all relevant UK and EU legislation relating to the protection and enhancement of ecology has been complied with during the refurbishment process. – A landscape and ecology management plan will be produced covering at least the first five years after the project completion, in line with LE 02 requirements. - The proposed plant mix includes a combination of evergreen shrubs, robust flowering perennials, and spring summer flowering bulbs. There will be a strong evergreen structure all year, and a variety of leaf textures including a high proportion of ferns. - Considering the existing site was of low ecological value, the proposed landscaping is expected to increase biodiversity gains and the urban greening factor.

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	We will: – Resist the loss of trees and vegetation of significant amenity, historic, cultural, or ecological value including proposals which may threaten the continued wellbeing of such trees and vegetation. – Require trees and vegetation which are to be retained to be satisfactorily protected during the demolition and construction phase of development in line with BS5837:2012 'Trees in relation to Design, Demolition and Construction' and positively integrated as part of the site layout. – Expect replacement trees or vegetation to be provided where the loss of significant trees or vegetation or harm to the wellbeing of these trees and vegetation has been justified in the context of the proposed development. – Expect developments to incorporate additional trees and vegetation wherever possible.		
	**Climate change resilience** Camden Local Plan (2017) Policy CC1 – The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation. – promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy; – ensure that the location of development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks; – support and encourage sensitive energy efficiency improvements to existing buildings; – expect all developments to optimise resource efficiency Policy CC2 Adapting to Climate Change All development should adopt appropriate climate change adaptation measures such as: – The protection of existing green spaces and promoting new appropriate green infrastructure. – Not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems. – Incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate. GLA London Plan 2021 Policy GG6	**New Camden Local Plan** **Policy CC1 - Responding to the climate emergency** A. The Council will prioritise the provision of measures to mitigate and adapt to climate change and require all development in Camden to respond to the climate emergency by: a. Supporting the retrofitting of existing buildings to make them more energy efficient and reduce the energy needed to occupy the building. b. Prioritising and enabling the repurposing and re-use of existing buildings over demolition. c. Following circular economy principles, minimising waste and increasing re-use. d. Reducing whole life carbon emissions, by taking a whole life carbon approach, considering both embodied carbon and operational carbon. e. Being designed and constructed to be net zero carbon in operation. f. Utilising low carbon technologies and maximising opportunities for renewable energy generation, and heat networks. g. Being designed to be resilient to climate change and meet the highest standards of sustainable design and construction. h. Minimising the risk of overheating through design and avoiding reliance on air conditioning. i. Improving water efficiency.	– Car-free development – The following mitigation methods will be implemented to reduce the amount of heat entering the building in summer within the proposed development: – Facades have been developed with suitable glazing-to-solid ratios, with particular focus on south facing orientations. Glazing ratios for the development – Suitable g-values will be specified to further control solar heat gains as required; and – Buildings will have the capability for internal blinds to be installed to improve occupant comfort. - Increase of UGF and BNG through landscaping which will improve the building's microclimate.

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	– Demonstrate that the development is resilient to predicted climate conditions during the building's lifetime. – Improve energy efficiency and support the move towards a low carbon circular economy. Policy SI 4 – A Development proposal should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure	j. Minimising and avoiding the risk of flooding from all sources, and incorporating multifunctional Sustainable Urban Drainage Systems (SuDS) to reduce surface water run-off; k. Protecting and enhancing existing green spaces and water sources, enhancing l. biodiversity, strengthening nature recovery and providing multi-functional green infrastructure; and m. Prioritising sustainable transport. –	
SOCIAL			
	**Transport** GLA London Plan 2021 Policy T1 – Development Plans should support, and development proposals should facilitate the delivery of the Mayor's strategic target of 80 per cent of all trips in London to be made by foot, cycle or public transport by 2041. Policy T2 – Adopt the Healthy Streets approach and identify opportunities for walking, cycling, and traveling on public transport to create a greener and more pleasant streetscape. – Proposals should demonstrate how they will deliver improvements that support the ten Healthy Streets Indicators in line with Transport for London guidance Policy T4 – Implement Travel Plan and undertake Transport Assessment incorporating appropriate traffic modelling and analysis. – Provide appropriate levels of cycle parking & facilities as per the relevant local standards. Policy T5 – Supporting the delivery of a London-wide network of cycle routes, with new routes and improved infrastructure Policy T6 – Car-free development should be the starting point for all development proposals in places that are (or are planned to be) well-connected by public transport. – Encourage the uptake of low-emission vehicle use through provision of active charging points for all parking space types. Camden Local Plan (2017) Camden Policy T1 Prioritising walking, cycling and public transport The Council will promote sustainable transport by prioritising walking, cycling and public transport in the borough. Policy T2 Parking and car-free development	Transport CPG - Travel Plans enable a development to proceed without adverse impact on the transport network through promoting a greater use of sustainable travel and thereby helping to tackle congestion and air pollution. - The requirements of a travel plan will be tailored to the specific characteristics of the site and nature of the development.	– The proposed development is targeting the following BREEAM Transport credits which align with the GLA London Plan (2021) targets: o Tra 01 – Sustainable Transport Solutions o Tra 02 – Proximity to Amenities o Tra 03 – Cycle Storage o Tra 05 – Travel Plan

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	The Council will limit the availability of parking and require all new developments in the borough to be car-free.		
	**Air Quality** GLA London Plan 2021 (Policy SI 1) – Development must be at least Air Quality Neutral and provide an Air Quality Impact Assessment – Adopt non-combustion low and zero carbon energy technology Camden Local Plan (2017) CLP Policies CC4 Air Quality – Ensure that the development is at least air quality neutral. – Air Quality Assessments (AQAs) required where development is likely to expose occupants to high air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. – Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in 270 Camden Local Plan | Sustainability and climate change an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.	– Air Quality CPG: – All proposals involving demolition and construction should adopt best practice measures to reduce and mitigate emissions. – On-site monitoring may be required dependant on the scale of demolition and construction. – Certain developments using Non-Road Mobile Machinery (within the KW range) need to meet standards in the Mayor's Dust and emissions SPD. – The impact of outdoor air pollution on indoor air quality in new developments needs to be taken into account at the earliest stages of building design. – Development should take into consideration the location of amenity space and opportunities for appropriate planting 'greening'. – Development should reduce emissions by being energy efficient (reducing emissions associated with the operation of the building). – Development should prioritise more sustainable modes of transport and where applicable improve the walking and cycling environment.	– The Proposed Development will be a car-free development to encourage cycling, walking and public transport The proposed development is targeted all credits for Hea 02 – Indoor Air quality. – An Indoor Air Quality Plan will be completed with the objective of facilitating a process that leads to design, specification and installation decision and action that minimise indoor air pollution during occupation of the building. – The energy strategy for the Development is all electric, utilising Air Source Heat Pumps (ASHP), a zero- combustion emission technology. Therefore, due to the absence of any significant combustion emissions during normal operation, there will be no adverse impacts on the air quality at the Development as a result of any energy plant. – No boilers are proposed.
	**Noise** GLA London Plan 2021 Policy D13, – Meet acoustic standards for residential design and incorporate mitigation where required. Policy D14 Noise – Reduce, manage and mitigate noise to improve health and quality of life – Separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation Camden Local Plan (2017) Policy A4 Noise and vibration The Council will seek to ensure that noise and vibration is controlled and managed. Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission for:	Sustainable Design and Construction SPG (2014) Policy 4.4 Noise. – Areas identified as having positive sound features or as being 'quiet areas' should be protected from noise enhanced, where possible. London Plan policy 3.2, 7.15 – Noise should be reduced at source and then designed out of a scheme to reduce the need for mitigation measures. London Plan policy 3.2, 5.3, 7.6, 7.15	– A noise/acoustic assessment will be completed in association with BREEAM Pol 05 (noise attenuation) and Hea 05 (acoustic performance) requirements.

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	– Development likely to generate unacceptable noise and vibration impacts; – Development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses. The council will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.		
	**Public realm** GLA London Plan 2021 Policy S1 – Social infrastructure needs should be addressed via area-based planning such as Opportunity Area Planning Frameworks, Area Action Plans, Development Infrastructure Funding Studies, Neighbourhood Plans or master plans. Policy D2 – The density of development proposals should consider, and be linked to, the provision of future planned levels of infrastructure rather than existing levels. The proposals should also be proportionate to the site's connectivity and accessibility by walking, cycling, and public transport to jobs and services. Policy D5 – Support the creation of inclusive neighbourhoods by embedding inclusive design and collaborating with local communities in the development of planning policies that affect them. – Design and Access Statements, submitted as part of development proposals, should include an inclusive design statement. Policy D8, – Protect and enhance existing open space and new spaces to meet minimum standards on quality, access and quantity. Create or contribute to safe, attractive, high quality, inclusive and legible public realm, including reduction in crime or fear of crime. Camden Local Plan (2017) Policy A2, A3 – To improve and protect Camden's Metropolitan Open Land, parks and open spaces, and protect and enhance biodiversity, in addition to providing for new habitats and open space.	Sustainable Design and Construction SPG (2014) Policy 4.2 Land contamination – Developers should set out how existing land contamination will be addressed prior to the commencement of their development. London Plan policy 3.2, 5.3, 5.21 – Potentially polluting uses are to incorporate suitable mitigation measures. London Plan policy 3.2, 5.3, 5.21 Policy 4.5 Light pollution – Developments and lighting schemes should be designed to minimise light pollution. London Plan policy 5.2, 5.3, 6.7	– Ensure design is in-keeping with surrounding area – Accessible and inclusive design; undertake an accessibility assessment in association with BREEAM requirements – Ensure inclusion of locals both during the construction phase and during operation and incorporate suggestions where possible in association with BREEAM requirements
ECONOMIC			

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	**Built environment** GLA London Plan 2021 Policy E1, E2 – Consider the need for a range of suitable workspaces including lower cost and affordable workspace. – The scope for the re-use or otherwise surplus large office spaces for smaller office units should be explored Policy GG6 To help London become a more efficient and resilient city, those involved in planning and development must: – Seek to improve energy efficiency and support the move towards a low carbon circular economy, contributing towards London becoming a zero-carbon city by 2050. – Ensure buildings and infrastructure are designed to adapt to a changing climate, making efficient use of water, reducing impacts from natural hazards like flooding and heatwaves, while mitigating and avoiding contributing to the urban heat island effect C create a safe and secure environment which is resilient the impact of emergencies including fire and terrorism. – Take an integrated and smart approach to the delivery of strategic and local infrastructure by ensuring that public, private, community and voluntary sectors plan and work together. Policy D3 – A All development must make the best use of land by following a design-led approach that optimises the capacity of sites, including site allocations Policy HC3 – A Strategic Views include significant buildings, urban landscapes or riverscapes that help to define London at a strategic level. They are seen from places that are publicly accessible and well-used. The Mayor has designated a list of Strategic Views (Table 7.1) that he will keep under review. Development proposals must be assessed for their impact on a designated view if they fall within the foreground, middle ground or background of that view. Policy HC4 – Development proposals should not harm, and should seek to make a positive contribution to, the characteristics and composition of Strategic Views and their landmark elements. They should also preserve and, where possible, enhance viewers' ability to recognise and to appreciate Strategically Important Landmarks in these views and, where appropriate, protect the silhouette of landmark elements of World Heritage Sites as seen from designated viewing places. Camden Local Plan (2017) Policy A1	Camden Planning Guidance (SPD) Energy Efficiency and Adaptation 2021 – All developments should demonstrate how sustainable design principles have been considered and incorporated. – Sensitive improvements can be made to historic buildings to reduce carbon dioxide emissions. – The 20% carbon reduction target (using on-site renewable energy technologies) applies for developments of five or more dwellings and/or more than 500 sqm of any gross internal floorspace (see Chapters 2 and 4). – BREEAM Excellent is required for all non-residential development of 500sqm or more floorspace – Other assessment tools such as Passivhaus are encouraged, they can serve to demonstrate the incorporation of sustainable design principles. Camden Local Plan - Holborn Growth Area – To ensure that all development is supported by necessary infrastructure and maximises the opportunities and benefits for the local and surrounding communities and the borough as a whole.	– The location of the development within the Central Activities Zone demonstrates alignment with indicates that the site is suitable for large-scale redevelopment and be targets for significant job creation given its proximity to local transport interchanges.

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	– The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity. Policy A5 – The Council will only permit basement development where it is demonstrated to its satisfaction that the proposal would not cause harm to a. neighbouring properties; b. the structural, ground, or water conditions of the area; c. the character and amenity of the area; d. the architectural character of the building; and e. the significance of heritage assets. The Council will require evidence of the impact of basement schemes in the form of a Basement Impact Assessment to be conducted by appropriately qualified professionals. Policy D1 – The Council will seek to secure high quality design in development		
HUMAN			
 **Health and Wellbeing**	GLA London Plan 2021 Policy D3 Optimising site capacity through the design-led approach Developments should: – Enhance local context by delivering buildings and spaces that positively respond to local distinctiveness – Encourage and facilitate active travel – achieve safe, secure and inclusive environments – deliver appropriate outlook, privacy and amenity – provide conveniently located green and open spaces – help prevent or mitigate the impacts of noise and poor air quality – achieve indoor and outdoor environments that are comfortable and inviting for people to use Policy GG1 – Encourage early and inclusive engagement with stakeholders, including local communities, in the development of proposals, policies and area-based strategies – Seek to ensure that London continues to generate a wide range of economic and other opportunities, and that everyone is able to benefit from these to ensure that London is a fairer, more inclusive and more equal city Policy GG 3 Creating a healthy city Those involved in planning and development must: – Assess the potential impacts of development proposals and Development Plans on the mental and physical health and wellbeing of communities, in order to mitigate any potential negative impacts, maximise potential positive impacts, and help	Sustainable Design and Construction SPG (2014) Policy 3.2 Tackling increased temperature and drought – Developers should include measures, in the design of their schemes, in line with the cooling hierarchy set out in London Plan policy 5.9 to prevent overheating over the scheme's lifetime. London Plan policy 5.3, 5.9	– The Proposed Development will be a car-free residential development to encourage cycling, walking and public transport. The development will include secure cycle storage. – BREEAM Tra 01 (Sustainable Transport Solutions) and Tra 02 (Proximity to Amenities) have been met and awarded as the project achieves PTAL of 6b and is within sufficient distance to local amenities. – BREEAM Tra 03 (Cyclist Facilities) will provide space for active transport infrastructure (e.g. bike storage) and cyclist facilities (showers, changing facilities, lockers, drying spaces).

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	reduce health inequalities, for example through the use of Health Impact Assessments – Seek to improve London's air quality, reduce public exposure to poor air quality and minimise inequalities in levels of exposure to air pollution – Ensure that new buildings are well-insulated and sufficiently ventilated to avoid the health problems associated with damp, heat and cold. Policy D5 – Support the creation of inclusive neighbourhoods by embedding inclusive design and collaborating with local communities in the development of planning policies that affect them. – Design and Access Statements, submitted as part of development proposals, should include an inclusive design statement. Policy D14 – A To reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise Camden Local Plan (2017) Policy C1 – The Council will improve and promote strong, vibrant and healthy communities through ensuring a high-quality environment with local services to support health, social and cultural wellbeing and reduce inequalities. Measures that will help contribute to healthier communities and reduce health inequalities must be incorporated in a development where appropriate. – The Council will require: – a. development to positively contribute to creating high quality, active, safe and accessible places; and – b. proposals for major development schemes to include a Health Impact Assessment (HIA). Policy C5 – The Council will aim to make Camden a safer place. Policy C6 The Council will seek to promote fair access and remove the barriers that prevent everyone from accessing facilities and opportunities. Policy CE1 Climate Change – Developments must incorporate measures for on-site sustainable food production corresponding to the scale of the development. Policy CL2 Design Quality – Inclusive design and accessible to all – Secure and design out crime. – Developments should be adaptable to changes of use, lifestyle, demography, and climate. Policy CL5 Living Conditions – Ensure good standards of daylight and sunlight are achieved. – Ensure reasonable visual privacy for occupants.		

Theme	Relevant local policies (adopted)	Future policy & SPD guidance	Measures being explored
	**Daylight and Sunlight** GLA London Plan 2021 Policy D6 – Provide sufficient daylight and sunlight to new and surrounding housing that is appropriate for its context, whilst avoiding overheating, minimising overshadowing and maximising the usability of outside amenity space. Policy D9 Wind, daylight, sunlight penetration and temperature conditions around the building(s) and neighbourhood must be carefully considered and not compromise comfort and the enjoyment of open spaces, including water spaces, around the building. Camden Local Plan (2017) – To improve and protect Camden's Metropolitan Open Land, parks and open spaces, and protect and enhance biodiversity, in addition to providing for new habitats and open space.		– BREEAM Hea 01 (Visual Comfort) is marked as potential. This requires a daylighting assessment to ensure the building is compliant with the requirements. – An overheating assessment will be completed

4. Whole Life Carbon

A Whole Life Carbon (WLC) assessment has been prepared by Hoare Lea on behalf of the Applicant in support of the planning application for the Proposed Development situated within the London Borough of Camden. The assessment includes the following:

- Calculations of whole life carbon accounting for upfront embodied carbon, in-use embodied carbon, end of life carbon and operational utility (energy and water) carbon, following the RICS Professional Standard "Whole life carbon assessment for the built environment" (2nd edition, version 3, 2024).
- Comparison with industry benchmarks.
- Outline of the carbon reduction opportunities already identified in the scheme as well as the opportunities that will be explored throughout the remainder of the design and construction.

4.1 Summary of Results

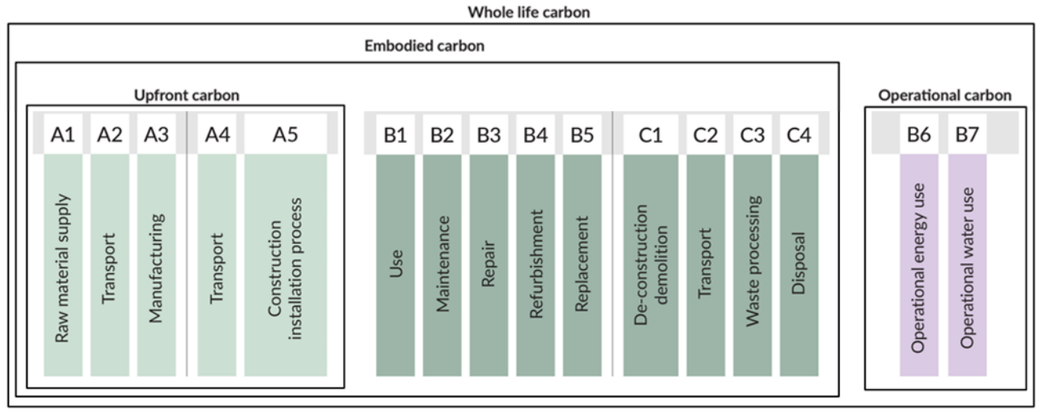
The results shown in Figure 1 provide the anticipated impact of the Proposed Development across a 60-year life cycle when assessed in line with the recommended inputs set out in the RICS Professional Standard for WLC Assessments (2nd edition). This includes baseline specification and assumptions around transport for each material, which are summarised in Appendix A.

Opportunities that will be explored during the subsequent design stages include but are not limited to; higher percentages of cement replacement including investigating emerging materials such as calcined clays, low carbon finishes and services equipment such as EAF ductwork.

The WLC results for the Proposed Development are presented in Figure 2. Whilst these results don't capture the impact of structural retention, the Proposed Development will seek to reduce emissions further throughout the design and procurement phases. Opportunities that will be explored during the subsequent design stages include but are not limited to; higher percentages of cement replacement including investigating emerging materials such as calcined clays, low carbon finishes and services equipment such as EAF ductwork and re-use and repurposing of materials as outlined in the Circular Economy Statement.

	Upfront Carbon	Embodied Carbon	Whole Life Carbon
Baseline results	366	249	858
Results including 15% contingency	421	287	987

Figure 2: Whole life carbon breakdown of the Proposed Development presented in $kgCO_2e/m^2GIA$



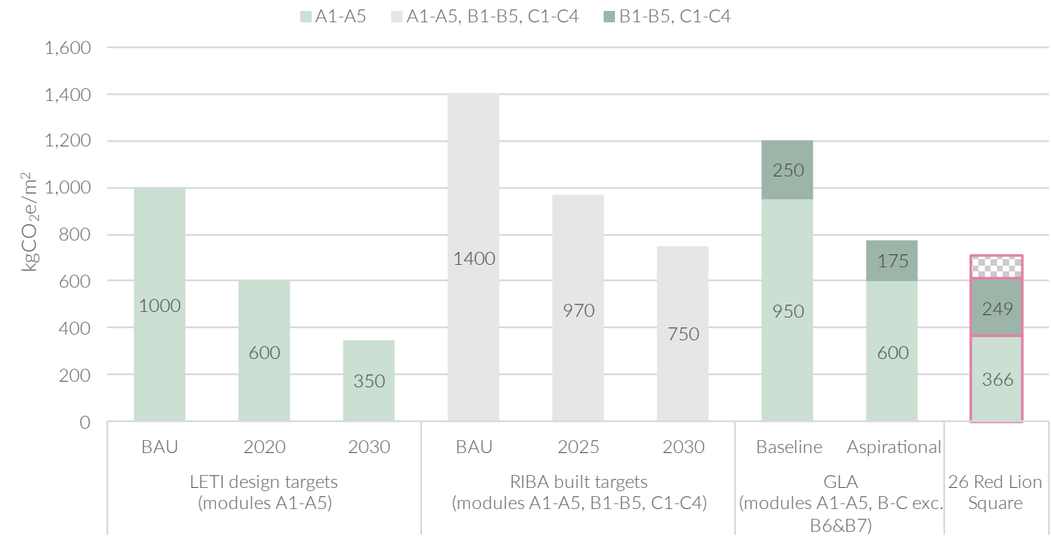


Figure 3: Comparison of the Proposed Development with benchmarks (excl. operational modules B6 and B7) and 15% contingency

Figure 3 shows how the Proposed Development compares to the GLA targets for office buildings. Due to the current stage of design, the Proposed Development should be considered with a ±15% contingency, in line with the RICS Professional Standard.

4.2 Background to Life Cycle Assessment and Embodied Carbon.

Global climate change is widely considered to be one of the most pressing challenges at a regional, national, and international level. Industrialisation has resulted in the use of refined and unrefined fossil fuels as an energy source and since the start of the industrial revolution, use of fossil fuels and their resultant release of carbon dioxide into the atmosphere has caused an exponential increase in the concentration of carbon dioxide and other pollutants that are generally agreed to result in increasing global average surface temperature.

It is outside the scope of this report to describe the wide-ranging impacts of climate change; however urgent action is required to limit carbon dioxide and limit the impacts of climate change.

Carbon emissions from operational use of buildings has been the subject of regulation for some time and has historically been the primary focus of reducing the impact of built environment projects. More recently, this focus has been expanded to also include carbon emission associated with the building materials themselves.

Some studies have historically suggested that 40-50% of the total carbon emissions for buildings over their lifetime are due to embodied carbon. With increasing energy efficiency within buildings and an increasingly decarbonised electricity supply, building operational carbon emission are being acknowledged to be rapidly reducing. As this occurs, the significance of embodied carbon emissions increases and the potential for reduction of overall carbon emissions through structural design choice and material selection becomes greater.

4.3 Whole Life Carbon Assessment Modules.

In order to standardise Whole Life Carbon Assessments, they are reported against a number of stages as defined in EN 15978; 7.4. These life cycle stages begin with raw material extraction, moving through product manufacture, transportation, and installation within a development, this continues into maintenance and use of a site during operation, and eventual material disposal at the end-of-life stage. These stages are grouped into three modules, A, B, and C, representing upfront, operational, and end-of-life carbon., as set out in Figure 4. Module D represents the circularity of products which are reused or recycled.

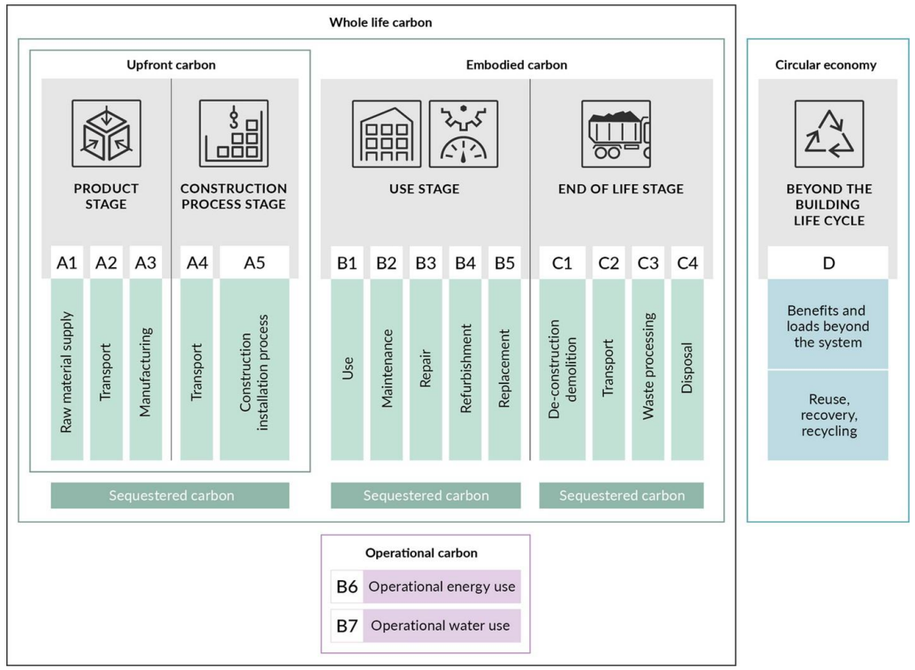


Figure 4: Whole life carbon modules and stages as defined by EN 15978; 7.4

4.4 Industry Guidance and Benchmarks.

4.4.1 RICS whole life carbon.

The RICS professional standard: Whole Life Carbon (WLC) assessment for the built environment, originally released in 2017, with a second edition published in 2023 and updated in 2024, seeks to standardise WLC assessment and enhance consistency in outputs by providing guidance on implementing the broad appraisal methodology set out in EN 15978: Sustainability of Construction Works. The Greater London Authority have adopted the RICS WLC methodology in their guidance methodology for Whole Life Carbon assessment of referable planning applications.

4.4.2 Greater London Authority WLC requirements.

The new London Plan came into effect on 2 March 2021. It mandates Whole Life Carbon Assessments in a bid to meet net zero carbon commitments for referrable applications (150 residential units, buildings over 30m in height or commercial buildings over 2,500m^2 for all boroughs except the City of London which states buildings over 150m and commercial buildings over 10,000m^2).

- Policy SI2: Minimising greenhouse gas emissions
  Whole Life Carbon (WLC) emissions should be calculated for each project via a life-cycle assessment (LCA) and the actions taken to reduce WLC emissions should be demonstrated. This is mandatory for referable applications, but it should be noted that GLA guidance on WLC encourages LCA to be done for all projects in London.

The GLA defines WLC as including operational carbon (heating, lighting and appliances), as well as embodied carbon from manufacture, maintenance and end-of-life.

The Mayor of London's (Greater London Authority, GLA) 'Whole Life-Cycle Carbon Assessment Guidance (March 2022) follows EN 15978 (the European standard for measuring building performance) and the 2017 RICS (Royal Institute of Chartered Surveyors) Professional Statement: Whole life carbon assessment for the built environment (which has also been adopted by RIBA, the Royal Institute of British Architects).

The GLA sets WLC principles which have been adopted to inform how the Proposed Development's considers WLC. These principles are referred to throughout the document demonstrating how consideration on each key principle have been made.

Whilst the GLA does not provide specific targets for WLC, it provides "benchmarks" based on previous project assessments and have been cross referenced with data provided by WLC tools including OneClick LCA.

The WLC benchmarks should be used as a guide by all applicants. The benchmarks provide a range rather than a set value and are broken down into building components. Projects with higher WLC emissions than the benchmarks should carefully examine how they can reduce WLC emissions. The GLA benchmarks are shown in Figure 5 .

4.4.3 Upfront and Embodied Carbon Targets for Office Buildings

Industry standards have been produced by LETI, RIBA and the GLA, each providing targets/benchmarks for embodied carbon. These are presented in Figure 5, however, the scope of each differs slightly as follows:

- LETI targets relate to upfront carbon, i.e., building life cycle modules A1-A5.
- LETI targets related to the year of design.
- RIBA targets are the full embodied building life cycle, i.e., building life cycle modules A1-A5, B1-B5, C1-C4.
- RIBA targets are performance based and so relate to the years the buildings are completed.
- GLA benchmarks are broken down into lifecycle modules A1-A5 and B-C.

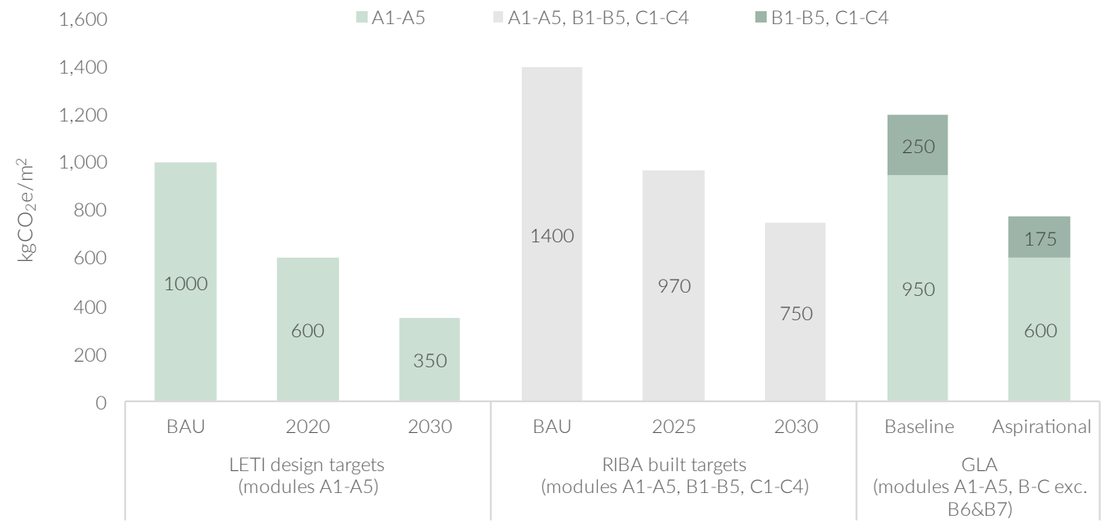


Figure 5: Embodied carbon targets for offices buildings from LETI, RIBA and GLA (Source: RIBA Climate Challenge 2020 v2, LETI embodied carbon primer, GLA Whole Life-Cycle Carbon Assessments Guidance).

4.5 Methodology and Inputs.

4.5.1 Assessment scope.

The assessment of Whole Life Carbon (WLC) emissions consists of the following sections: total operational carbon emissions (regulated plus unregulated); embodied carbon emissions; and any future potential carbon emission 'benefits', post end-of-life, including benefits from reuse and recycling of building structure and materials.

This assessment has been undertaken in line with the GLA guidance for undertaking WLC Assessments and therefore in line with the RICS Professional Statement: Whole Life Carbon Assessment for the Built Environment.

Operational carbon emissions

The anticipated operational energy performance of the Proposed Development has been estimated through the methodology set out in CIBSE TM54 and the results for are detailed below. For full details of this assessment, refer to the Energy Statement also submitted in support of the planning application.

- The operational energy has been converted to carbon emissions over a 60-year study period using the FES Falling Short decarbonisation trajectory.
- The estimated Energy Use Intensity (EUI) total EUI for the operational energy was 111 kWh/(m^2.yr)

Embodied carbon assessment and end-of-life emissions

To assess the embodied carbon for the project, a Life Cycle Assessment (LCA) tool – OneClick LCA – has been used to make allocations for the anticipated material quantities in an inventory analysis. The materials are represented within the model by using materials with associated Environmental Product Declarations (EPDs). EPDs are produced by manufacturers and identify the carbon emissions of a product. By scheduling the materials proposed for the development, the overall carbon emissions can be approximated.

It should be noted here that the LCA tool has a limited database of materials. In the scenario where a specified material isn't included in the database, the most similar material in terms of material composition is selected instead.

In line with standard UK practice, the LCA process and results included by this report have been assessed in line with BS 15978:2011 and the RICS Professional Statement: Whole Life Carbon assessment for the built environment. All EPDs used have been produced in line with the requirements of BS EN 15804:2012.

4.5.2 Inputs.

Table 2 lists the building elements covered by the assessment, in line with the Royal Institute of Chartered Surveyors (RICS) Professional Statement: Whole Life Carbon assessment for the built environment.

Table 2: Data used in the embodied carbon assessment.

Building element group	Building element (NRM level 2)	Basis for information
0 Demolition	0.1 Toxic/hazardous/contaminated material treatment	An allowance for contaminated land removal and treatment has not been included for the Site at this stage of the design as it is not currently anticipated any treatment will be required. This will be considered further as the scheme progresses.
	0.2 Major demolition works	No allowance for demolition of the building at end of life has been provided. This will be considered further as the scheme progresses.
0 Facilitating works	0.3 & 0.5 Temporary/enabling works	No allowance for excavation works has been included. This will be considered further as the scheme progresses.
	0.4 Specialist groundworks	No specialist ground works were included separately, with individual ground works accounted for in the relevant sub structure / external landscaping sections. The results to this assessment should be viewed with a 15% margin of error providing an allowance for additional works that may be required as the design develops.
1 Substructure	1.1 Substructure	These materials have been estimated in line with information provided by the design team in the cost plan and supporting drawings. The specification of materials has been informed by RICS WLC Guidance for all calculations.
2 Superstructure	2.1 Frame	These materials have been estimated in line with information provided by the design team in the cost plan and supporting drawings. The specification of materials has been informed by RICS WLC Guidance for all calculations.
	2.2 Upper floors incl. balconies	These materials have been estimated in line with information provided by the design team in the cost plan and supporting drawings. The specification of materials has been informed by RICS WLC Guidance for all calculations.
	2.3 Roof	These materials have been estimated in line with information provided by the design team in the cost plan and supporting drawings. The specification of materials has been informed by RICS WLC Guidance for all calculations.
	2.4 Stairs and ramps	These materials have been estimated in line with information provided by the design team and cost plan. Standard construction data in the OneClick database has also been utilised.
	2.5 External walls	These materials have been estimated in line with information provided by the design team, façade specific embodied carbon calculations, and supporting drawings.
	2.6 Windows and external doors	These materials have been estimated in line with information provided by the design team and cost plan.
	2.7 Internal walls and partitions	These materials have been estimated in line with information provided by the design team and cost plan.
	2.8 Internal doors	These materials have been estimated in line with information provided by the design team and cost plan.
3 Finishes	3.1 Wall finishes	These materials have been estimated in line with information provided by the design team and cost plan. The design of many landlord areas is still in abeyance and therefore allowances for elements have been included for now.
	3.2 Floor finishes	
	3.3 Ceiling finishes	
4 Fittings, furnishings and equipment (FF&E)	4.1 Fittings, furnishings & equipment incl. building-related* and non-building-related**	These materials have been estimated using the components listed within the cost plan.

Building element group	Building element (NRM level 2)	Basis for information
5 Building services/MEP	5.1–5.14 Services incl. building-related* and nonbuilding-related**	Allowances for all building services / MEP components have been established using the methodology set out in RICS 2nd edition (2024) MEP Supplementary tables.
6 Prefabricated Buildings and Building Units	6.1 Prefabricated buildings and building units	No prefabricated elements are applicable.
7 Work to Existing Building	7.1 Minor demolition and alteration works	No allowance was considered at this stage due to lack of information.
8 External works	8.1 Site preparation works	No allowance was considered for site preparation works at this stage. This will be considered further as the scheme progresses.
	8.2 Roads, paths, paving and surfacing	No allowance was considered for soft landscaping, planting and at this stage. This will be considered further as the scheme progresses.
	8.3 Soft landscaping, planting and irrigation systems	No allowance was considered for soft landscaping, planting and irrigation systems at this stage. This will be considered further as the scheme progresses.
	8.4 Fencing, railings and walls	No allowance was considered for fencing, railings and walls at this stage. This will be considered further as the scheme progresses.
	8.5 External fixtures	No allowance was considered external fixtures at this stage. This will be considered further as the scheme progresses. This will be considered further as the scheme progresses.
	8.6 External drainage	No allowance was considered external drainage at this stage. This will be considered further as the scheme progresses. This will be considered further as the scheme progresses.
	8.7 External services	No allowance was considered external services at this stage. This will be considered further as the scheme progresses. This will be considered further as the scheme progresses.
	8.8 Minor building works and ancillary buildings	No allowance was considered for minor building works and ancillary buildings. This will be considered further as the scheme progresses.

Life-cycle modules

Table 3 gives a description of each life cycle stage, and a commentary on, the source of information used for each stage.

Table 3: The Life Cycle Modules included in the assessment and commentary on the data source.

Module	Description	Commentary of Data Source
A1-A3 Construction Materials	Raw material supply (A1) includes emissions generated when raw materials are taken from nature, transported to industrial units for processing and processed. Loss of raw material and energy are also taken into account. Transport impacts (A2) include exhaust emissions resulting from the transport of all raw materials from suppliers to the manufacturer's production plant as well as impacts of production of fuels. Production impacts (A3) cover the manufacturing of the production materials and fuels used by machines, as well as handling of waste formed in the production processes at the manufacturer's production plants until end-of-waste state.	Calculated using EPD's which align the most-applicable similar product. (See Appendix A for standard specifications).
A4 Transportation to site	A4 includes exhaust emissions resulting from the transport of building products from manufacturer's production plant to building site as well as the environmental impacts of production of the used fuel.	Transport distances were estimated based on typical average transport distances based on material type & project location, in line with RICS standard assumptions. (See Appendix A).
A5 Construction/ installation process	A5 covers the exhaust emissions resulting from using energy during the site operations, the environmental impacts of production processes of fuel and energy and water as well as handling of waste until the end-of-waste state.	At this stage of design, A5 emissions have been estimated in line with RICS WLC PS Rev 02, employing a rate of 35 $kgCO_2e/m^2$ (demolition) for A5.1 and 40 $kgCO_2e/m^2$ (GIA) for A5.2, and applying associated wastage rates for new materials.
B1 In-Use Emissions	The in-use module B1 captures the in-use emissions arising from the life of a building from its components. It is expected that the primary contributor to this will be the fugitive emissions stemming from refrigerant leakage.	Refrigerant charges have been provided by MEP Engineers. The refrigerant leakage rates are taken in line with CIBSE TM65 as below (See Appendix A): ASHP Annual leakage rate– 4% End-of-life leakage rate- 2%
B2 & B3 Maintenance and Repair	Module B2 accounts from the carbon emissions arising from any activity relating to maintenance and cleaning. Module B3 accounts or any of the carbon emissions relating to repair.	Following GLA Whole Life Carbon Guidance: B2 has been assumed to be the greater of either 10 $kgCO_2e/m^2$ or 1% of the emissions produced in modules A1-A5. B3 has been assumed to be 25% of B2.

Module	Description	Commentary of Data Source
B4 & B5 Material Replacement/Refurbishment	The emissions B4 and B5 cover impacts from raw material supply, transportation, and production of any replaced new material as well as the impacts from manufacturing the replaced material and handling of waste until the end-of-waste state.	Modules B4/B5 has been determined with reference to the 'indicative component lifespans' contained within the RICS PS. (See Appendix for lifespan)
B6 Energy use	The considered use phase energy consumption (B6) impacts include exhaust emissions from any building level energy production as well as the environmental impacts of production processes of fuel and externally produced energy. Energy transmission losses are also taken into account.	The anticipated operational energy performance of the Proposed Development has been estimated through the methodology set out in CIBSE TM54. For full details of this assessment, refer to the supporting Energy Statement also submitted in support of the planning application. The operational energy has been converted to carbon emissions over a 60-year study period using the FES Falling Short decarbonisation trajectory. The anticipated EUI for the development is 111 kWh/(m^2.yr)
B7 Water use	The considered use phase water consumption (B7) impacts include the environmental impacts of production processes of fresh water and the impacts from wastewater treatment.	Total water consumption is based off the BSRIA water consumption estimate of 20 litres/person/day and an occupancy density of 8 m^2/p. This has been modelled with a global warming potential of 0.38 $kgCO_2e/m^3$.
C1-C4 Deconstruction	The impacts of deconstruction include impacts for processing recyclable construction waste flows for recycling (C3) until the end-of-waste stage or the impacts of pre-processing and landfilling for waste streams that cannot be recycled (C4) based on type of material. Additionally, deconstruction impacts include emissions caused by waste energy recovery.	C1 Deconstruction/demolition) and C2 (Transport) are based on default values. C3 (Waste Processing) and C4 (Disposal) use OneClick LCA's default end of life scenarios, please refer to the appendix for further detail.
D External impacts/end-of-life benefits	External benefits for re-used or recycled material types include the positive impact of replacing virgin-based material with recycled material and the benefits of the energy which can be recovered from the materials.	D (End of Life) use OneClick LCA's default end of life scenarios, please refer to the appendix for further detail.

4.5.3 Life cycle assessment impacts.

A building Life Cycle Assessment considers a range of environmental indicators that assess the relevant overall impacts of the materials selections. Whilst ideally an LCA assessment would consider all environmental factors relevant to the product or material, due to lack of information in some cases, and lack of consensus in how to calculate Key Performance Indicators (KPIs) within the industry, not all environmental impacts can be considered.

Standard ratios are used to convert the various greenhouse gases into equivalent amounts of CO_2. These ratios are based on the global warming potential (GWP) of each gas. GWP is a relative measure of how much a given mass of greenhouse gas is estimated to contribute to global warming over a given time interval – usually 100 years. It is expressed relative to carbon dioxide which is set as the baseline which other emitters are compared against, and which therefore has a GWP of 1.

This assessment thus reports on the embodied carbon of the development as 'global warming potential' with the annotation 'CO_2 equivalent (CO_2e)'.

4.6 Data sources.

There are a number of approaches to complete a building specific life cycle assessment. A flexible approach is needed when utilising a dataset of product specific environmental product declarations and more generic data calculated within the LCA tool. Table 4 indicates the sources of the data used for this assessment:

Table 4: Types of data required for a WLC assessment.

Data Source	File references
Stage 2 Cost Plan	26 Red Lion Square - Stage 2 November 2024 Rev1.pdf
Energy Statement	5425667-HLE-XX-XX-RP-ST-402026-26 Red Lion Square Energy Strategy-P02.pdf

4.7 Coverage Adjustment Factor Application

In order for accurate carbon assessment in construction projects, GLA Guidance requires the use of a coverage factor. This factor guarantees that all elements contained within a cost plan are included in the assessment of whole life carbon, despite not having detail of the materiality of all building elements at early stages.

The GLA expects 95% of the cost for each package (RICS category) must be considered in assessments. The coverage factor is calculated by finding the cost value of those items included in the assessment modelling and those not included, then using the two values to find the cost value proportion missing from the assessment. The following formula is then used to calculate the coverage factors to apply to each package (category):

Coverage adjustment factor = (100 per cent / per cent of cost covered in the given category).

Due to the detail included within this assessment, it has been concluded that a suitable allowance has been made for all elements and therefore coverage adjustment factors have been applied.

4.8 Contingency Factors Application

When costing projects, it is common for contingencies to be used to reflect uncertainties. For WLC assessments, there are similar uncertainties, particularly during the early design phase when far less is known about the final design and materials. RICS v2, stipulates the consideration of contingency for the WLC based on uncertainties due to three different factors. This method consists of developing a WLCA contingency factor, which is generated from a three-factor approach:

- Contingency factor, based on project phase, equivalent to 6% at Stage 2.
- Carbon data uncertainty factor, based on quality of carbon data of ten most impactful products or materials, equivalent to 5% at this stage.
- Quantities uncertainty factor, based on the accuracy of quantities data of the same ten most impactful products, equivalent to 4% at this stage.

These individual factors are added together to produce an overall contingency factor to be applied to the WLCA results. Following RICS v2 guidance results in **a total contingency percentage of 15%, which has been applied to the WLCA results for all scenarios.** The methodology behind this is provided in Appendix C.

5. Sitewide Anticipated Performance

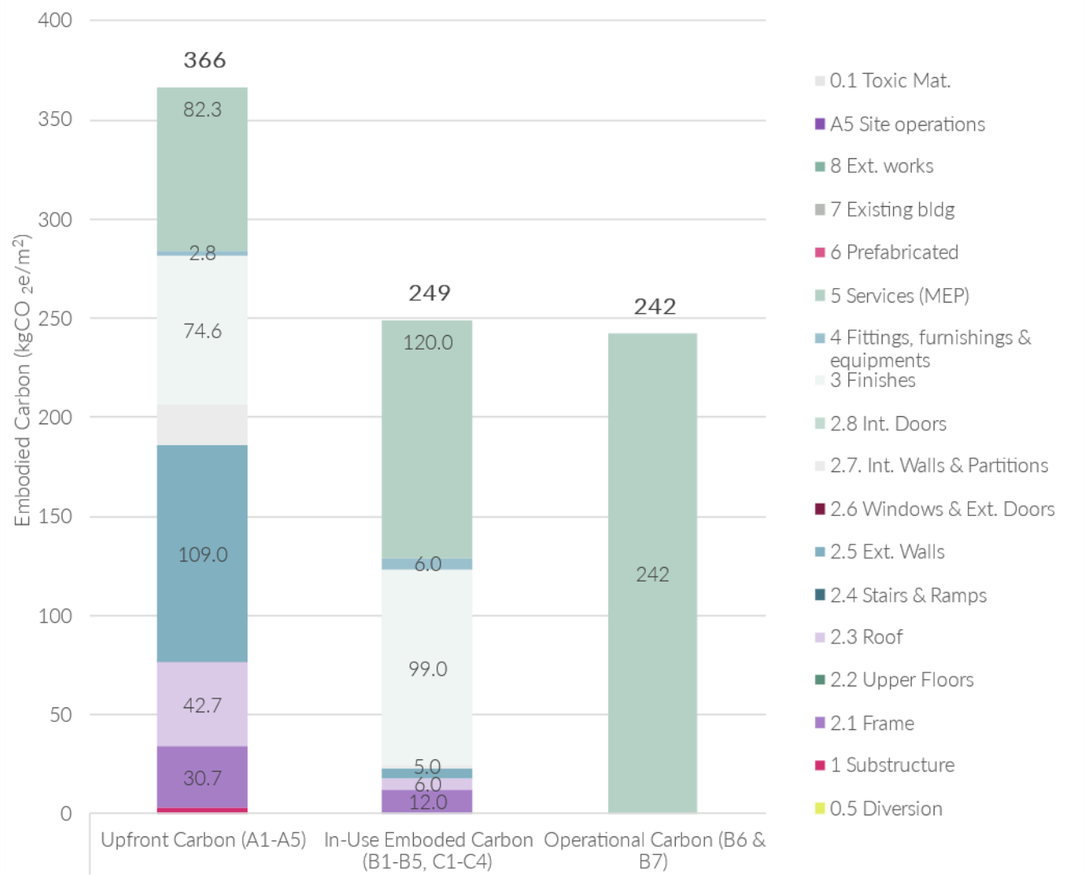


Figure 6: Whole life carbon breakdown for the Proposed Development by lifecycle stage and element (excluding contingency).

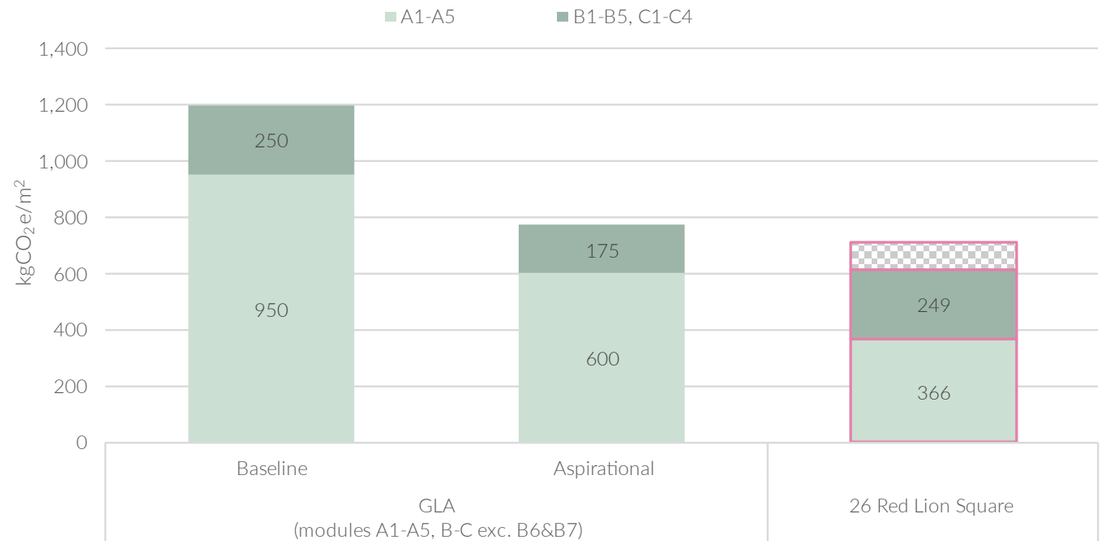
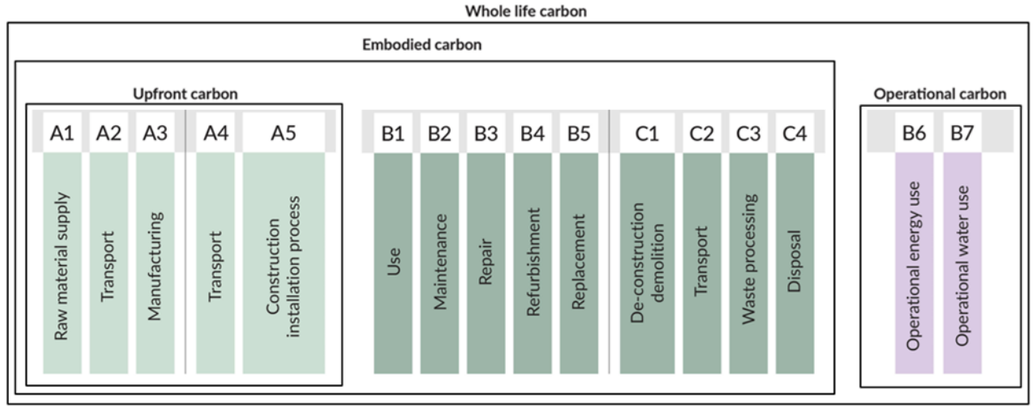


Figure 7: Proposed Development embodied carbon results comparison with GLA benchmarks including 15% contingency

The results in Figure 6 showcase the whole life carbon for the Proposed Development utilising RICS WLC guidance specifications for materials, as detailed in Appendix A. The bar chart highlights the split between the operational (28%) and embodied (72%) carbon and presents how the embodied carbon and upfront carbon are broken down by building element. This breakdown has also been presented on the next page in Table 5

Upfront carbon (A1-A5): **366** **$kgCO_2e/m^2$**

Embodied carbon (A1-C4 excl. B6 & B7): **616** **$kgCO_2e/m^2$**



Result category *All results presented in $kgCO_2e/m^2$*	Upfront carbon (A1-A5)		Embodied carbon (A1-A5, B1-B5, C1-C4)		Operational carbon (B6 & B7)	
Contingency (Y/N)	N	Y	N	Y	N	Y
0.1 Treatment, Demolition works & Facilitating works	0	0	0	0	0	0
1.Substructure	3	4	0	0	0	0
2.1. Frame	31	35	12	14	0	0
2.2.Upper floor	0	0	0	0	0	0
2.3.Roofs	43	49	6	7	0	0
2.4.Stairs, ramps and safety guarding	0	0	0	0	0	0
2.5.External envelope including roof finishes	109	125	5	6	0	0
2.6.Windows and external doors	0	0	0	0	0	0
2.7.Internal walls and partitions	21	24	1	1	0	0
2.8.Internal doors	0	0	0	0	0	0
3.Finishes	75	86	99	113	0	0
4.Fittings, furnishings and equipment	3	3	6	7	0	0
5.Services	82	95	120	138	242	279
8.External Works	0	0	0	0	0	0
A5, B2 and B3 allowances	0	0	0	0	0	0
TOTAL	366	421	249	287	242	279

Table 5: Whole life carbon breakdown by building element and lifecycle module. Results shown with and without contingency.

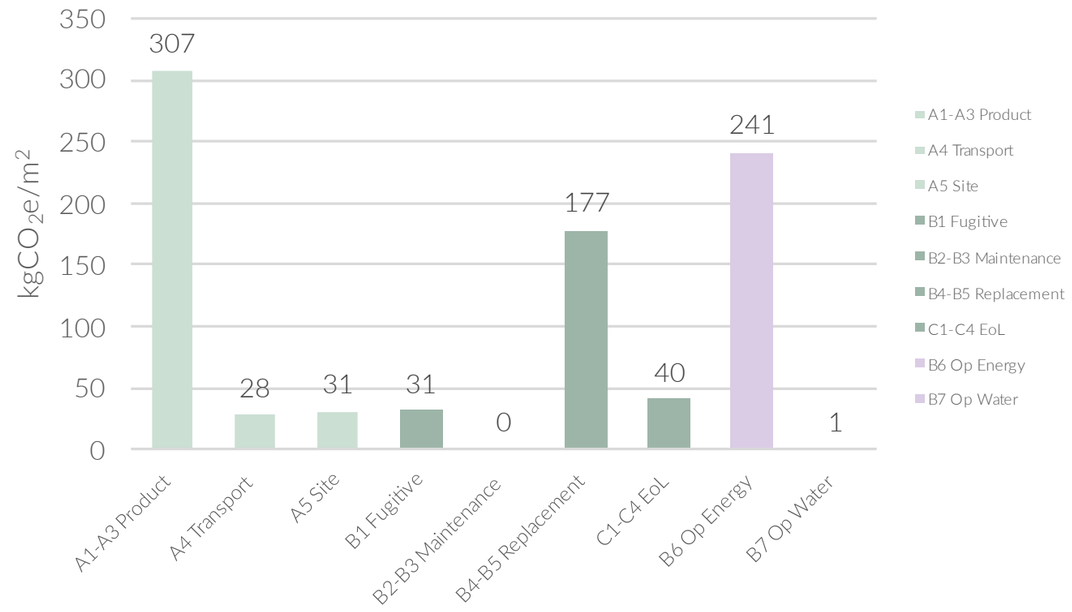


Figure 8: Whole life carbon breakdown for the Proposed Development by lifecycle module without contingency

Operational carbon (B6 & B7): 242 **$kgCO_2e/m^2$**

Whole life carbon (A1-C4): 858 **$kgCO_2e/m^2$**

6. Embodied carbon reduction opportunities.

6.1 Future Reduction Opportunities

Throughout the early design phases, the focus has been on maximising the extent of structural retention within the existing building to reduce the WLC impact. In addition to this approach scheme, the development will continue to seek further WLC reductions as the project moves into the technical design, procurement, and construction phases.

Table 6 shows the top 10 most contributing materials and their corresponding upfront carbon impact as well as detailing potential reduction opportunities that will be explored throughout the remainder of the project.

Table 6: Future reduction opportunities

Rank	Material	Upfront carbon impact $kgCO_2e/m^2$	% of total upfront carbon	Opportunity
1	Raised access flooring panels	54.9	15%	Currently modelled with new Kingspan RG5 panel. The opportunity to procure reclaimed floor panels onsite has been identified. Alternatively, lower carbon materials can be explored.
2	Foamglass insulation used within balconies and terraces	28.2	8%	Alternative types of insulation can be investigated such as: – Phenolic insulation – Glass wool insulation
3	Aluminium framed unitized curtain wall system	23.6	6%	Alternative types of aluminium profiles can be investigated such as: – HYDRO CIRCAL 100R Aluminium profiles (Baseline case: 30% recycled content) – HYDRO Reduxa Aluminium profiles (Baseline case: 30% recycled content)
4	RC C32/40 ready mix concrete used within external walls and façade.	20.2	6%	Currently modelled with 25% GGBS content. Opportunities for reduction throughout the procurement phase of the project include: – Specification of higher levels of cement replacement – Alternative cement replacement to GGBS such as calcined clays
5	Steel studs used within internal partitions and lining	21.6	6%	Timber studwork can be investigated but fire risk implications need to be considered
6	RC 40/50 ready-mix concrete used within the Precast Concrete Fins.	15.3	4%	Currently modelled with 25% GGBS content. Opportunities for reduction throughout the procurement phase of the project include: – Specification of higher levels of cement replacement – Alternative cement replacement to GGBS such as calcined clays.
7	Hot dip galvanized steel within building services	11.7	3%	Due to the level of design the services are currently represented using a system level rate. As more detail is available throughout the technical design and construction, opportunities for reduction can be explored.
8	Elevators	11.5	3%	Limited opportunity to reduce without removing the total number of lifts or reducing capacity.
9	Structural open rolled steel sections	10.6	3%	Currently modelled as UK average steel in line with the IStructE guidance. Specification of EAF steel could result in a significant reduction. Opportunities may be available to reuse steel sections from other sites depending on supply availability and suitability.
10	Air to water heat pump	10.1	3%	Limited opportunity to reduce without removing the total number of air to water heat pumps or reducing capacity.

7. Circular Economy Statement

7.1 Approach

Circular Economy considerations have formed a key part of the project sustainability strategy, given the scale of the Proposed Development, and the client's wider sustainability aspirations. It is recognised that in order to implement Circular Economy principles most effectively, it is helpful to explore strategic opportunities as early in the Proposed Development process as possible.

This is in compliance with the following policies in the Development Plan and draft Development Plan:

- London Plan; D3, SI 7, SI 8
- Local Plan; CS 17, DM 17.2
- Draft City Plan 2036; S16, CEW 1.

While specific values and benchmarks have been defined for some of the metrics, it is recognised that these are preliminary targets and commitments which will be reviewed and may be adjusted as appropriate during the detailed design to respond to the specific requirements of each element with the aim of following best practice and that opportunities to innovate are maximised.

Considerations around resource efficiency, material circularity and ethical sourcing will be considered within the overarching sustainability strategy from the early stages.

It is acknowledged that the approach to Circular Economy will evolve as the design evolves, or in response to wider considerations and feedback from key stakeholders.

A series of sustainability-focused workshops will be held in collaboration with the client and project team to help craft a holistic and consistent sustainability approach for the development.

The design team will discuss commitments around the promotion of sustainable use of materials comprising several targets around materials and waste including priority given to renewable construction materials such as pre-fabrication, diversion of construction waste from landfill, maximising the use of recycled or reused materials, giving preference to solutions available closer to the site, construction resource efficiency and an overarching ambition to reduce the project's supply chain carbon intensity from materials and manufacturing relative to standard industry performance. This could be achieved through measures including:

- "Smart" material choices (prioritisation of durable, biodegradable, recycled/ recyclable materials and materials that can be reused or re-purposed, where possible).
- Incorporation of modular elements for higher levels of design flexibility and adaptability.
- Procurement of products as a service – leasing access to a solution instead of buying it.
- Product life extension through improved maintenance, remanufacturing, repairing, and upgrading/ upcycling.
- Closed loop / take back schemes – working with manufacturers who take back used products to recover the value by using them to make new products.

It is acknowledged that the approach to circular economy will evolve as the design evolves, or in response to wider considerations and feedback from the GLA or other stakeholders. The GLA Circular Economy Decision Tree has been followed from the outset of the project as demonstrated overleaf.

An effective incorporation of circular economy principles represents an opportunity for the site and the UK as a whole. With its system-wide perspective, the circular economy has the potential to help us make better decisions about resource use, design out waste, provide added value for business and society, and proceed along a secure route to society-wide prosperity and environmental sustainability for future generations.

7.2 Policy and Drivers

7.2.1 Wider context

Consumption of natural resources has historically followed a linear approach, heightened by the industrial revolution which, while lifting the living standards of millions, also dramatically increased pressure on environmental resources. Under the traditional 'take > make > use > dispose' model, raw materials are collected, then transformed into products that are used until they are finally discarded as waste. Apart from failing to capture value over the lifetime of products, this approach also produces a range of negative externalities that include resource scarcity, unsustainable levels of water extraction, rising carbon emissions, and widespread ecosystem pollution.

In a circular economy, built environment assets are designed so that whole buildings, and materials, components and parts can be continually and easily recycled.

The built environment sector is a major consumer of natural resources. There is growing industry consensus that the way we design, build, operate and dispose of our buildings and associated facilities needs a major overhaul to obviate waste and increase efficiency. There is an incredible breadth of opportunity that this shift in approach will create across the entire supply chain.

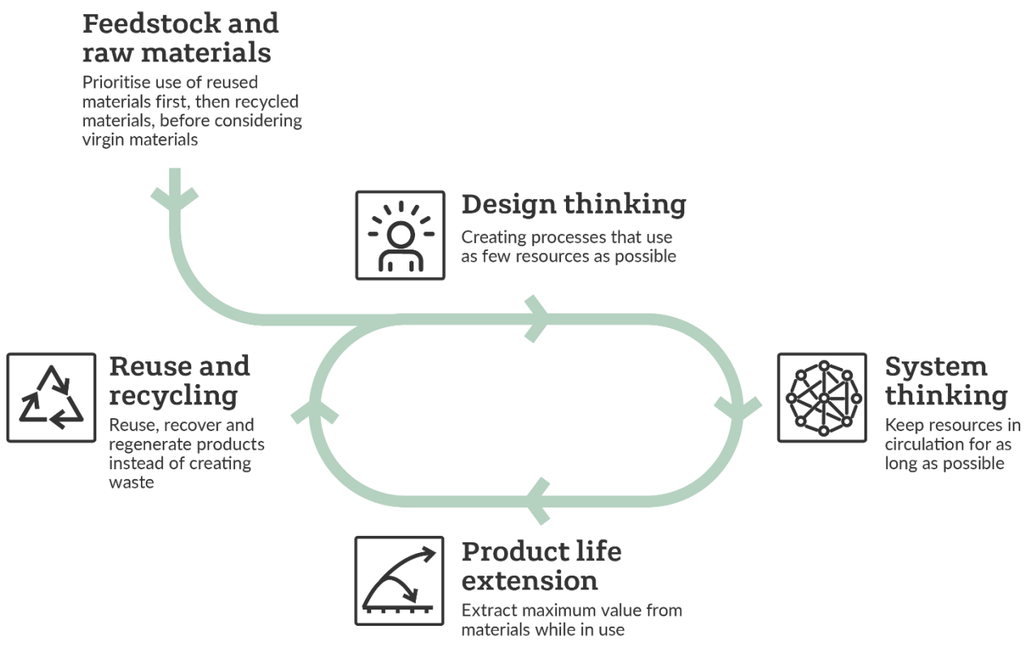


Figure 9: Circular Economy Approach

7.3 Targets

The following table details the minimum target for waste arising and recycling throughout the project, which follow the policy requirements as set out in Table 7.

Table 7: Targets for construction waste (Source: Camden, Pre-App Slides)

Target	Policy requirement	Project Baseline Target	How will performance against this metric be secured through design, implementation, and monitoring?
Demolition waste materials (non-hazardous)	Minimum of 95% diverted from landfill for reuse, recycling or recovery.	≥95% (by weight)	Pre-Demolition audit (to be carried out) will be provided to the demolition contractor.
Excavation waste materials	Minimum of 95% diverted from landfill for beneficial reuse.	N/A (no excavation proposed)	N/A
Construction waste materials	Minimum of 95% diverted from landfill for reuse, recycling or recovery.	≥95%	The construction waste requirements and targets will be provided to the contractor
Municipal waste	Minimum 65% recycling rate by 2030.	≥65%	Waste storage details and recyclable values will be addressed in the Operational Waste Management Strategy (to be completed)
Recycled content	Minimum 20% of the building material elements to be comprised of recycled or reused content.	≥20%	Recycled content requirements will be detailed in tender documentation and confirmed during detailed design RIBA Stage 3 and 4. At this stage a minimum overall percentage of 20% is targeted, but this is expected to be improved upon during detailed design and following workshops and discussions with the supply chain.

7.4 Design approach – pre-redevelopment audit.

Circular Economy considerations have formed a key part of the project sustainability strategy. It is recognised that in order to implement Circular Economy principles most effectively, it is helpful to explore strategic opportunities as early in the development process as possible.

A series of sustainability-focused workshops will be held in collaboration with the client and project team to help craft a holistic and consistent sustainability approach for the development. Considerations around resource efficiency, material circularity and ethical sourcing have been a critical element of the overarching sustainability strategy.

7.4.1 Circular economy decision tree

It is acknowledged that the approach to circular economy will evolve as the design evolves, or in response to wider considerations and feedback from the GLA or other stakeholders. The GLA Circular Economy Decision Tree has been followed from the outset of the project.

7.4.2 Existing buildings

The refurbishment of the proposed development will utilise the existing structure of the building. Following removal, cladding, windows, roof finishes and plant may have the potential to be recycled in the scheme.

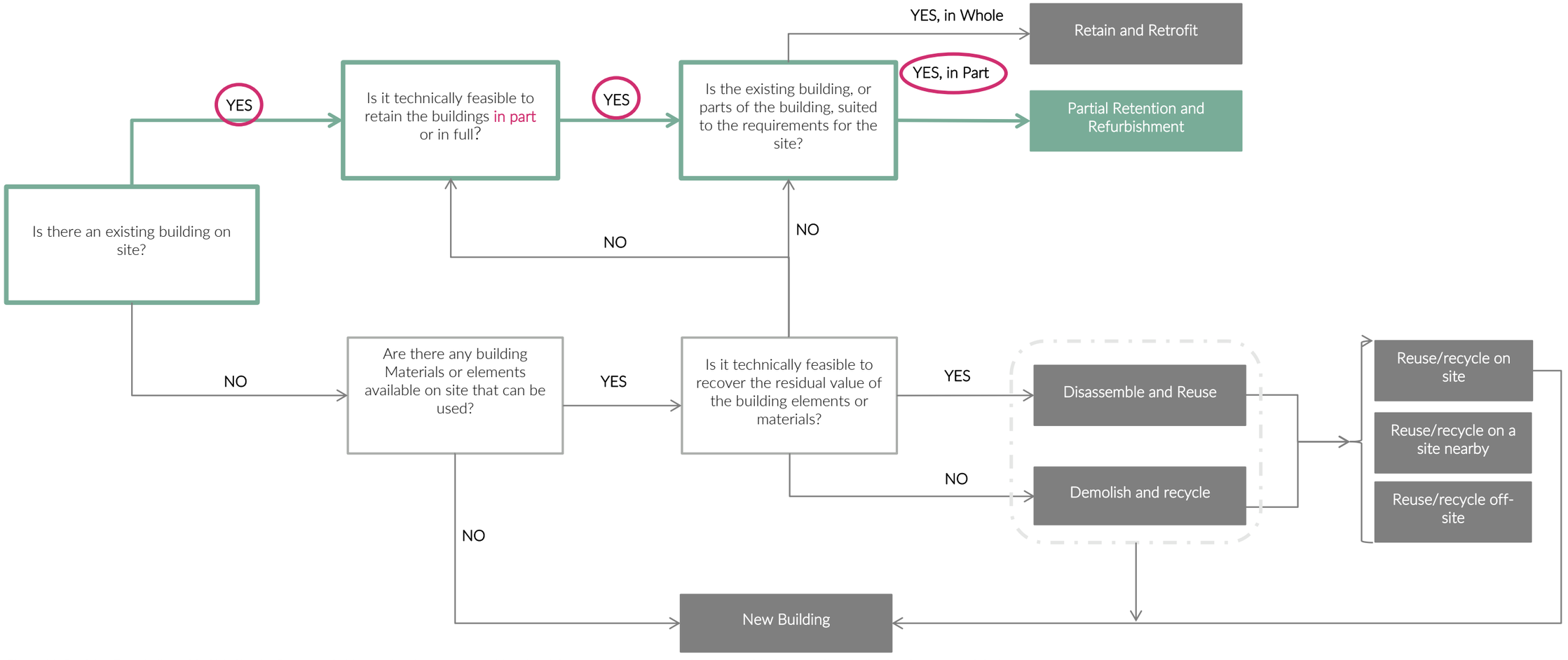


Figure 10: Decision Tree (in line with GLA Circular Economy Guidance) showing routes considered and the approaches representing them, with the green lines indicating the proposed design route.

7.5 Pre-Refurbishment Audit

A Pre-demolition Audit has been conducted by Waste Management Facilities Ltd which identified the expected waste which would arise as a result of the proposed demolition and deconstruction activities. The report also sets out the opportunities to reuse this waste either within the new development or off-site, as well as outlining the waste diversion from landfill targets.

The gathered information was analysed to derive the estimates of materials arising, as well as the potential opportunities for reuse, recycling, and landfill diversion.

Estimated demolition arisings

The Waste Management Facilities Ltd pre-demolition audit identified a total of 128 tonnes of material that is predicted to arise as a result of the proposed works. Of this, 99.6% has been identified as suitable for conventional methods of reuse or recycling, detailed in Figure 11.

Materials have been divided into Key Demolition Products (KDP): Metal is the largest KDP arising 52 tonnes), followed by Timber (28 tonnes), Plasterboard (15 tonnes), Glass (10 tonnes), Insulation (2 tonnes), Plastics (2 tonnes). There are also small amounts of non-material specific Tiles and Ceramics (1 tonne), Cardboard (4 Tonnes), Flooring (8 tonnes) and inert material (6 tonnes). Additional materials of fluorescent tubes and WEEE were identified but not quantified.

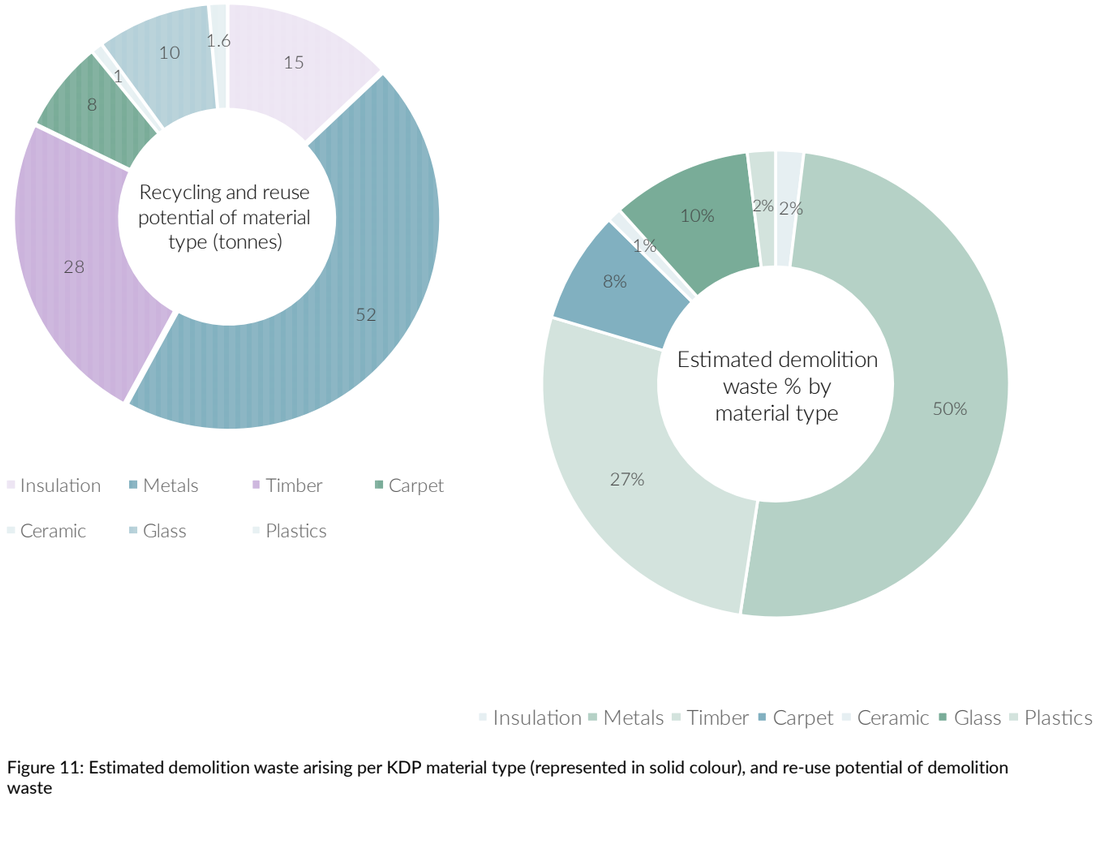


Figure 11: Estimated demolition waste arising per KDP material type (represented in solid colour), and re-use potential of demolition waste

Table 8: Estimated demo waste arisings by KDP and building layer

Material	Weight (tonnes)	Building Layer
Metal	52	Services Superstructure: Ceiling
Timber	28	Stuff
Plasterboard	15	Superstructure: Internal Walls & Partitions
Glass	10	Superstructure: Internal Walls & Partitions
Carpet	8	FFE
Insulation	2	Superstructure: Internal Walls & Partitions
Plastics	2	FFE
Tiles and Ceramics	1	FFE
Totals	118	Total

7.6 Potential for Re-use and Recycling

Under circular economy principles, re-use should always be prioritised rather than recycling, following the value retention hierarchy. Note for the purposes of this report (and the pre-demolition audit report), reuse is defined as reusing a product/material with minimal reprocessing usually in the same or similar function. Recycling is any recovery operation where waste materials are reprocessed into products, materials or substances, whether for original or other purposes. For example, crushing aggregates is considered a recycling activity.

The pre-demolition audit report recommends reuse and recycling options for each material / product type, feasible as per the value retention hierarchy. The report estimates that approximately 127.6 tonnes of material could be reused either on or off site or recycled, representing 99.6% of the total weight of demolition waste arisings.

The proposed development complies with local and national policy and will achieve exemplar sustainability. The analysis completed indicate the following project targets:

- 99.6% of demolition waste materials diverted from landfill for reuse, recycling or recovery.
- 95% of construction waste diverted from landfill for reuse, recycling or recovery.
- Targeting >20% of new building elements to be comprised of recycled or reused content

Material	Weight (tonnes)	Suitable for Re-Use and Recycling (tonnes)	Diversion from Landfill	Landfill
	Tonnes	Tonnes	%	%
Metal	52	52	100%	0%
Timber	28	28	100%	0%
Plasterboard	15	15	100%	0%
Glass	10	10	100%	0%
Carpet	8	8	100%	0%
Mixed Municipal flooring	-	-	-	-
Mixed CDM	-	-	-	-
Inert Material	6	6	100%	0%
Cardboard	4	4	100%	0%
Insulation	2	2	-	-
Plastics	2	1.6	80%	20%
Tiles and Ceramics	1	1	100%	100%
WEEE	-	-	-	-
Fluorescent tubes	-	-	-	-
Totals	128	127.6	99.6%	0.4%

7.7 Re-Use Strategy

The proposed re-use strategy incorporates the opportunities identified in the Pre-Demolition Audit and Design and Access statement (DAS).

The Pre-Demolition Audit identifies the expected waste which would arise through minor demolition and deconstruction and also provides opportunities for material recovery and re-use across each material category. The Pre-Demolition Audit also contains narrative on opportunities to implement re-use strategies, with references for re-use supply chains, potential receptors, and relevant industry resources. Figure 13 to Figure 15 demonstrate the existing reuse opportunities for key materials at the Proposed Development as identified in the Pre-Demolition Audit.

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Figure 15: Glass partitions to be advertised for reuse via Globechain.

Figure 14: Kitchen units to be advertised for re-use via Globechain for collection and use by local charities

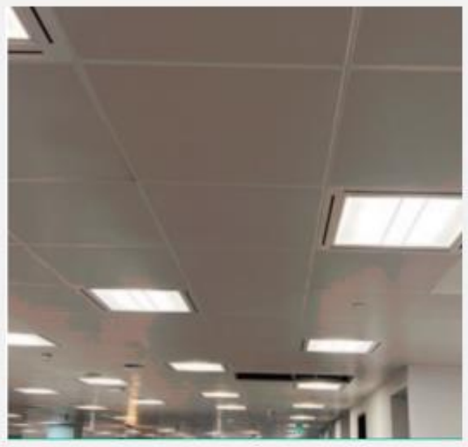


Figure 13: The condition of existing ceiling tiles allows for on-site or offsite reuse, whilst plasterboard has the potential to be recycled back into gypsum.

Figure 12: Lifts and plant machinery will be removed; specialist M&E consultants and engineers should be consulted regarding re-use potential.

The DAS highlights further circular economy strategies envisioned for the Proposed Development, identified by the design team to facilitate a lower embodied carbon impact. The following additional items have been identified for potential reuse or repurposing on site.

- Raised Access Flooring to be retained and refurbished where feasible.
- Pavers and Ballast for potential processing into aggregate and repurposed.
- FF&E for potential disassembly, storage, for potential take-back by manufacturers to be re-purposed for use off-site
- Lighting for potential disassembly, storage, for potential take-back by manufacturers to be re-purposed for use off-site
- Existing Cable Containment to be retained, refurbished or reused where feasible.
- Sprinkler tanks to be retained, refurbished or reused where feasible.
- Lightning Protection Systems to be retained, refurbished or reused where feasible.

7.7.1 Re-use strategy per material type

Source / Component	Location	Re-Use Target:	Potential Approaches (subject to further review and feasibility surveys):
Metal			
Raised access flooring tiles (surface)	Where identified	TBC	To be retained and refurbished where feasible
Ductwork	Whole building (excl. fire-rated ductwork)	TBC (>5%)	Disassembly and removal for potential take-back by ductwork manufacturers / installers.
Metal ceiling tiles (rectangular)	All levels	100%	Removal for re-use off-site advertised via Globechain
Lift and plant machinery	L1-6	TBC	Removal for re-use off-site, dependent on specialist M&E consultants and engineers' consultation
Lighting	All levels	TBC	Removal for re-use on/off-site Any fluorescent lighting should be segregated onsite, collected and disposed by a licensed hazardous waste carrier. The metal fittings, if not suitable for reuse should be segregated with the other metal for recycling.
Stone			
Cladding	External facades	TBC	The unitised approach of the existing building does not facilitate simple deconstruction of existing façade.
Timber			
Raised access flooring (core)	Where identified	TBC	Potential to store on site ahead of refurbishment for reuse on site where feasible. It is recommended that a local wood recycling organization is contacted to see what solid timber items are suitable for reclamation and reuse
Kitchen cabinets / worktops	Whole building	100%	Removal for re-use offsite by local charities via Globechain
Doors	Whole building	100%	Removal for re-use on/offsite It is recommended that a local wood recycling organization is contacted to see what solid timber items are suitable for reclamation and reuse
Carpet			
Carpet tiles	All levels and stairwells	100%	Removal for re-use on and off-site. Where condition permits, carpet tiles often have high potential for reuse as they are easy to remove without damage and subsequently reinstall elsewhere. Removal of low-quality tiles for recycling via contractors e.g., Globechain
Glass			
Double-glazed partitions	Internal	100%	Removal for re-use off-site by local charities via Globechain. Any glass unsuitable for reuse to be collected and processed at a Material Recycling Facility
Windows	External facade	100%	Removal for recycling off-site Due to the panellised existing faced system, the removal of window frames would require complete demolition and destruction of the weatherproofing gaskets
Insulation			
Insulation panels	All levels	TBC	Removal for re-use off-site or potential take-back by manufacturers. The insulation zone is sandwiched between the waterproofing membrane and the galvanised steel subframe and backing sheet requiring the demolition of both to replace insulation.
Tiles and Ceramics			
Ceramic Tiles	Bathroom areas	100%	Careful removal for re-use on/off-site Advertised for re-use offsite via Globechain Any material unsuitable for re-use could be recycled as crushed aggregate
Basins	Bathrooms areas	100%	Careful removal for re-use on/off-site Advertised for re-use offsite via Globechain Any material unsuitable for re-use could be recycled as crushed aggregate
Toilets	Bathrooms areas	100%	Removal for re-use on/off-site Advertised for re-use offsite via Globechain As the negative perceptions of used sanitaryware may impact the re-use potential, any material unsuitable for re-use could be recycled as crushed aggregate.
Ceiling Tiles	All levels	100%	Removal for re-use on/off-site Advertised for re-use offsite via Globechain Any material unsuitable for re-use could be recycled as crushed aggregate

Figure 16: Re-use strategy per material type

7.8 Strategy for new building layers.

The circular economy strategy for the new building layers addresses the following design approaches, split out into each layer as indicated on Figure 17.

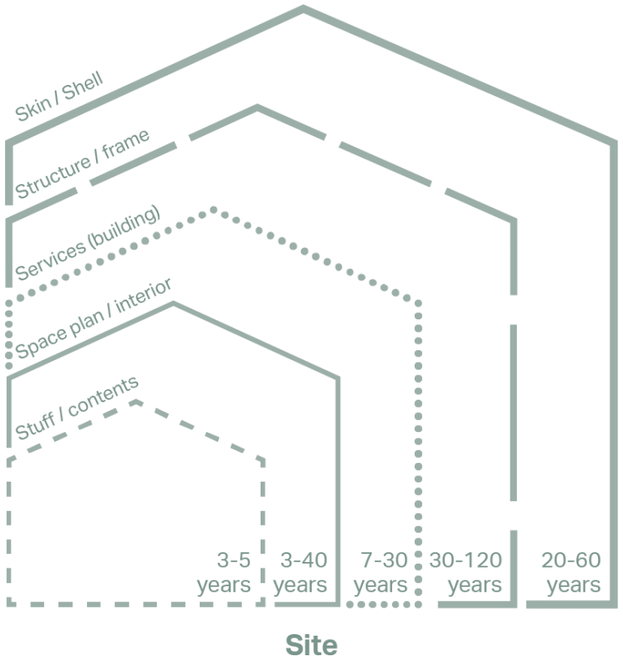


Figure 17: Building Layers and Standard Lifespans (Source: GLA)

For each layer a summary of the potential for reuse of the existing materials has been provided along with the circular economy design principles followed. The design principles assessed are:

Use Less
Design out waste. Design to minimise excessive use of virgin materials.

Adaptability
Design to future-proof the building to accommodate changing use scenarios and needs.

Flexibility
Design to accommodate regular changes in the short-term to meet occupant needs.

Maintainability
Design to improve the ease of maintenance of the building, systems and components to extend their useful life.

Longevity
Design to improve the durability of the building, systems and components to avoid unnecessary damage/ replacement.

Disassembly and deconstruction
Design to facilitate the deconstruction of the building while retaining the value the constituent elements.

Material Recovery
Design to enable recycling of materials at end-of-life, avoiding the need for downcycling.

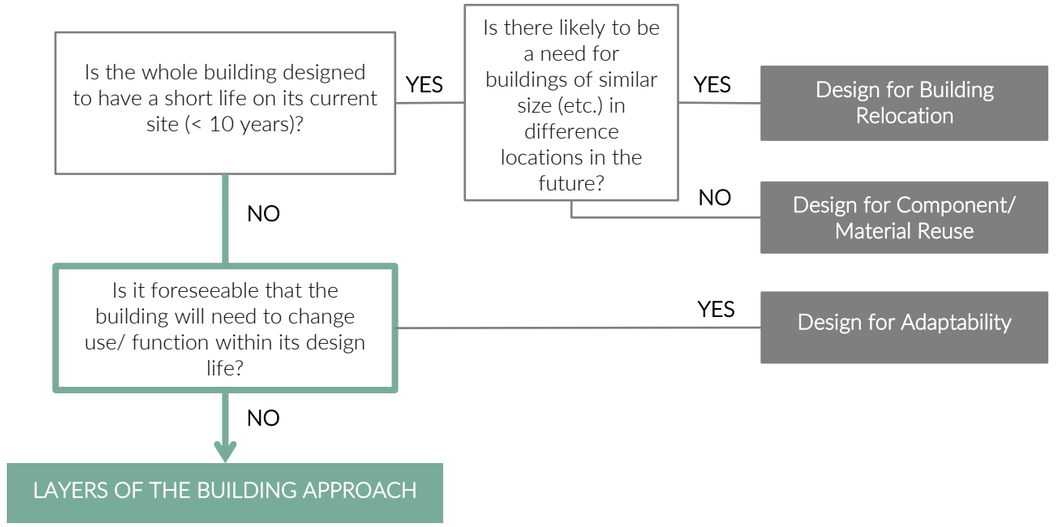
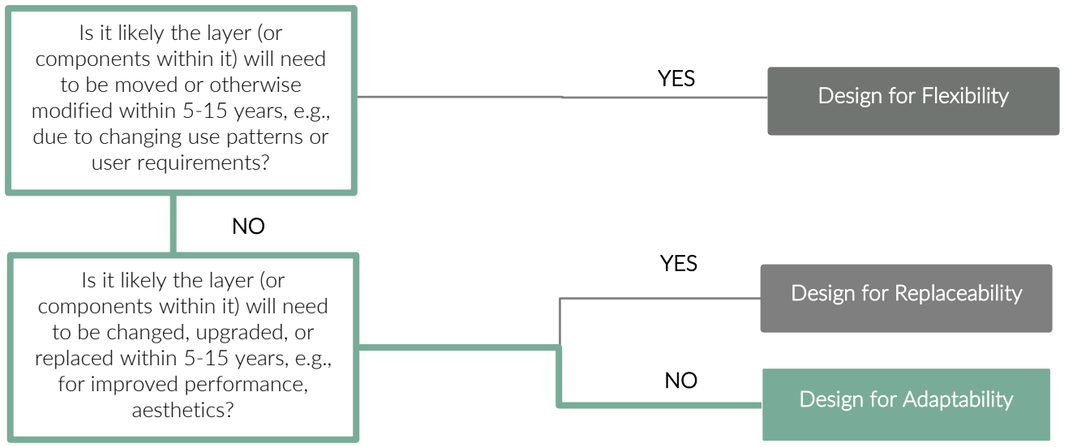


Table 9: Building layer summary (Source: GLA)

Building layer	Summary and constituent elements
Site	The geographical location, context, external works, earth works and landscaping.
Skin/shell e.g., façade	The layer keeping out water, wind, heat, cold, direct sunlight, and noise. Includes exterior surfaces such as the roof, siding, sheathing and windows. This layer includes the façade (front or face of a building). This layer often has biggest impact on long- term durability, occupant comfort and building-energy performance.
Substructure	Excavations, foundations, basements, and ground floors.
Structure/ structural frame/ superstructure	Load-bearing elements above plinth including roof-supporting structure. Generally, it is the longest-lasting building element. Insulation and services may be embedded here.
Services (building)	Installations to ensure comfort, practicality, accessibility, and safety, including plumbing, heating, cooling, ventilation, and electrics. Distribution systems can be hard to change.
Space/space plan/interior/ interior space	The layout, internal walls and partitions, ceilings, floors, surface finishes, fixtures, doors, fitted furniture. Changeable without changing structure, services, or skin.
Stuff/contents	Anything that could fall if the building was turned upside down. Not permanent, easily movable, most frequently changed by occupant, e.g., appliances, lamps, electronics, furniture, art.
Construction materials	Any temporary installations/works/materials, packaging and equipment.

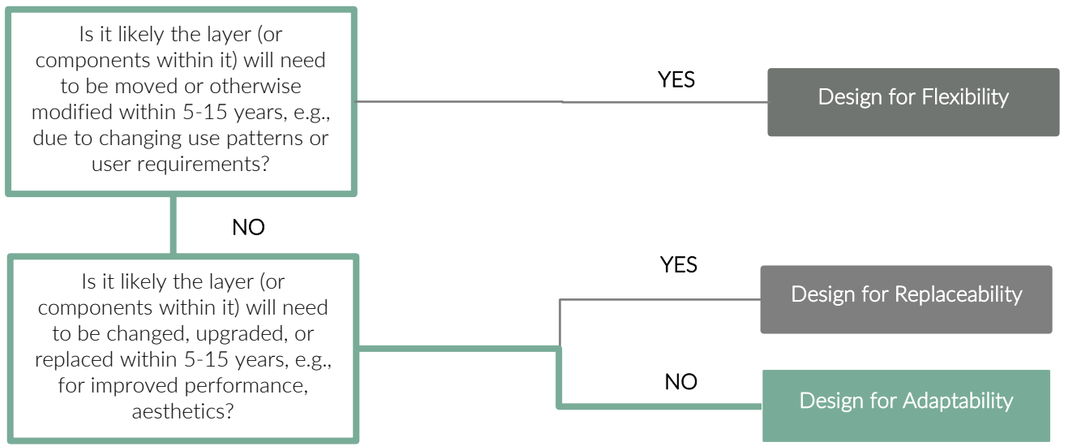
Skin/shell



New Building Circular Economy Design Approaches implemented:

Component of material reuse	Recycled material will be considered for the new pre-cast façade, reducing the initial carbon impact.
Adaptability	The façade system consists of large pre-cast concrete panels, complete with window systems and other façade elements, thereby designing in adaptability by allowing each unit to be changed or replaced throughout the life of the building, without any widespread intervention to the façade.
Flexibility	The façade system consists of large pre-cast concrete panels, complete with window systems and other façade elements, thereby designing in adaptability by allowing each unit to be changed or replaced throughout the life of the building, without any widespread intervention to the façade.
Replaceability	The façade system consists of large pre-cast concrete panels, complete with window systems and other façade elements, thereby designing in adaptability by allowing each unit to be changed or replaced throughout the life of the building, without any widespread intervention to the façade. Upper floor windows will be internally beaded to allow for replaceability.
Disassembly	The façade system consists of large pre-cast concrete panels, complete with window systems and other façade elements, thereby designing in adaptability by allowing each unit to be changed or replaced throughout the life of the building, without any widespread intervention to the façade.
Longevity	The façade system consists of large pre-cast concrete panels, complete with window systems and other façade elements, thereby designing in adaptability by allowing each unit to be changed or replaced throughout the life of the building, without any widespread intervention to the façade.

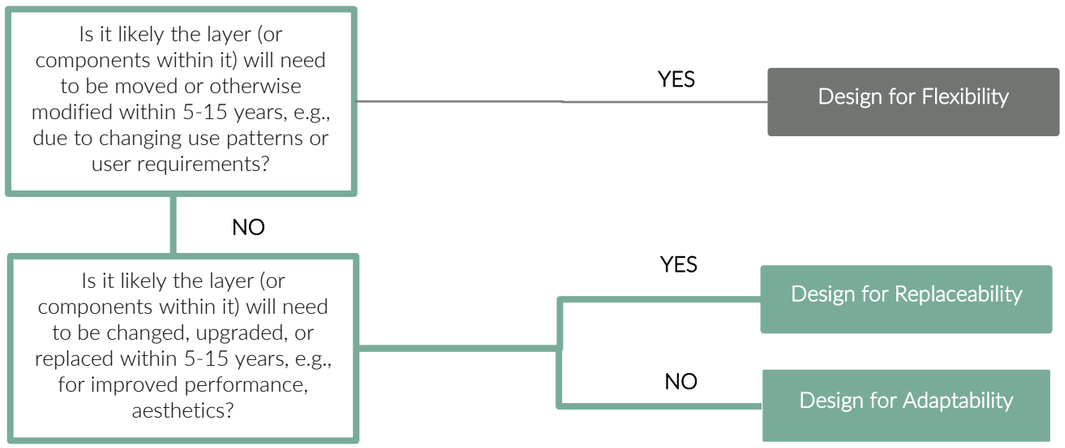
Structure/Frame



New Building Circular Economy Design Approaches implemented:

Component of material reuse	100% of the existing substructure will be retained. There is limited demolition of the existing structure and existing concrete frame, and stair cores will be utilised. Specification of new materials in line with circular economy principles to facilitate their future re-use, e.g., utilisation of the National Steelwork Specification 7th Edition with clauses guiding the use of reclaimed structural steel sections and requiring hard stamping of structural steelwork to identify material grade and strength
Adaptability	The new structural form is robust and will permit significant future interventions to be considered without need for demolition.
Flexibility	The structure has been designed for floor loading which allows for future flexibility of the floorplate whilst reflecting the primary intention of using the space for office purposes.
Disassembly	There is the potential for applying some modular off-site construction elements (e.g., pre-cast façade system) which would minimise disruption and noise during construction work, and may also provide routes for effective disassembly
Longevity	The structure is to be designed for at least a 60-year life span. Assessment of the extreme weather actions including flooding will be reviewed as a part of the design and incorporated.

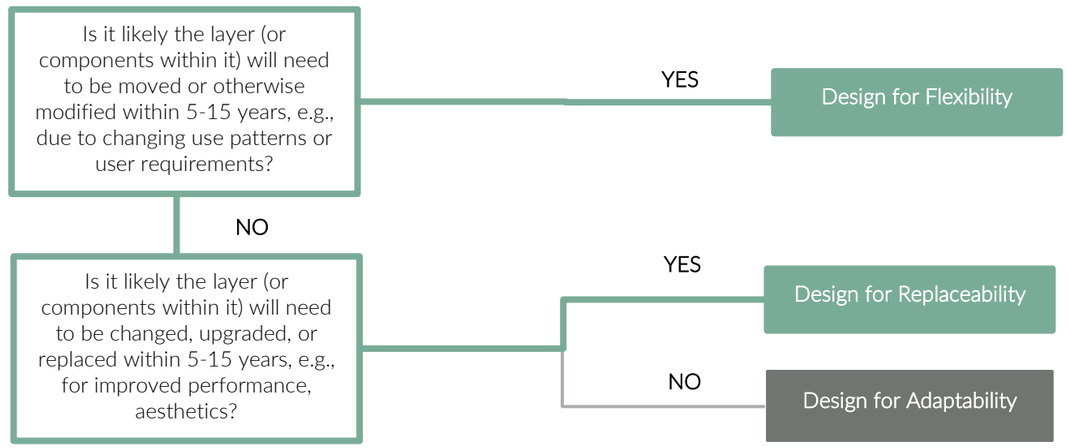
Services (building)



New Building Circular Economy Design Approaches implemented:

Adaptability	The risers may also provide connections with isolation valves on each floor to allow tenants to easily change the space and that minimise alterations to the primary network.
Flexibility	The risers have been designed in line with the BCO guidance which will give flexibility to the floor plate usage. There is a potential to move the riser into the floor plate to allow for additional WC's. Each office floorplate will be divided into appropriate servicing zones, in line with British Council for Offices (BCO) standards. In order to maximise the flexibility of the tenant fit-out installation, zones will be further sub-divided into sub-zones enabling installation of meeting rooms with minimal impact on adjacent zones.
Replaceability	A plant replacement strategy will be developed which could identify a site wide strategy for major plant replacement. Majority of the plant to be located in the Basement and 7th floor Where possible, plant and services will be modular to allow for items to be broken down to assist in replacing or reconfiguration
Longevity	Services are being designed in line with the current standards. Metallic services will be used to provide durability and better resilience for change in condition. The building services risers will be fully accessible for cleaning and maintenance at each accessible level. They will also be provided with a mesh flooring instead of concrete which will minimise embodied carbon and enable the floor to be removed to ease maintenance and disassembly.

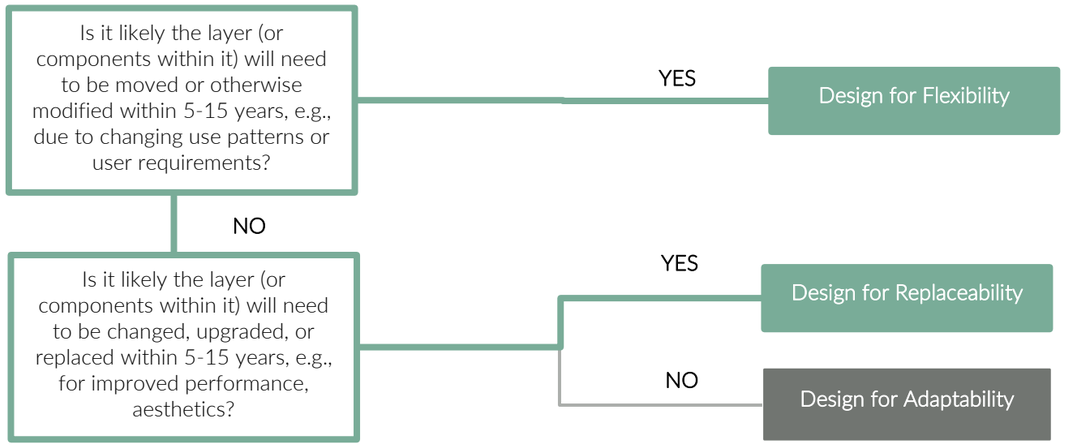
Space Plan/Interior



New Building Circular Economy Design Approaches implemented:

Flexibility	The floor plates may be designed to allow for subdivision enabling flexibility in number of tenants and workspaces.
Replaceability	Interior design is to be developed during detailed design stages and will consider the replaceability of materials.
Disassembly	Interior design is to be developed during detailed design stages and will consider the disassembly of materials.
Longevity	Specifications will demand subcontractor adherence to relevant industry standard sustainability schemes, e.g., BCSA Sustainability Charter, therefore providing robust components.

Stuff/Contents



New Building Circular Economy Design Approaches implemented

Component of material reuse	Interior design is to be developed during detailed design stages and will look to maximise material reuse.
Adaptability	Interior design is to be developed during detailed design stages and will look to enable adaptability.
Flexibility	The floorplates of the offices will be designed to shell and core only, with no finishes, allowing incoming tenants to fit-out these spaces to accommodate their specific needs
Replaceability	Interior design is to be developed during detailed design stages and will consider the replaceability of materials.
Disassembly	Interior design is to be developed during detailed design stages and will consider the disassembly of materials.
Longevity	Specifications will demand subcontractor adherence to relevant industry standard sustainability schemes, e.g., BCSA Sustainability Charter, therefore providing robust components

Table 10: Summary of End-of-life strategies for key building component

Building component	Design principle	End-of-life strategy
Skin (façade)	Design for longevity, disassembly, replaceability, adaptability	Material and component recovery, reuse and/or recycling. Standardised design and mechanical fixings will be preferred where possible to enable this. The façade has been designed to allow for prefabrication off site and therefore support disassembly.
Structure	Design for longevity and adaptability	Building re-use/change in use; deconstruction and material reuse and/or recycling. The building's open and flexible design will allow for future changes in use to a range of commercial spaces and for different tenants. Materials such as ceramics, timber, plasterboard, glass and metals can be recovered at end-of-life for reuse and/or recycling. Unlike the existing structural form, the new structural form is robust and will permit significant future interventions to be considered without need for demolition.
Building services	Efficient design; design for replaceability and maintainability	Refurbishment, reuse and/or component and material recovery and recycling. The building services will be designed and maintained to prolong their expected service life. The risers have been designed to allow for prefabrication off site and therefore support disassembly. Ease of access and independence of building services will enable building services to be replaced without major disruptions to the building.
Space (interior fit-out)	Material efficiency; design for flexibility and replaceability	Material and component recovery, reuse and/or recycling. Use of durable and demountable interior fit-out will allow for components and materials to be recovered and reused on-site. Alternatively, the option to share reusable materials with other buildings and charities can also be explored.

8. BREEAM

In line with local policy drivers and the Applicant's sustainability aspirations, BREEAM 2014 Refurbishment and Fit Out (RFO) will be targeted for the Proposed Development.

In line with local planning policy, the Proposed Development is targeting a minimum of BREEAM 'Excellent'.

The scope of the BREEAM assessment currently considers Parts 1, 2, and 3.

- Part 1: Fabric and Structure: Alterations to the main fabric including facade, roof or windows.
- Part 2 Core Services: Heating, ventilation and air-conditioning (HVAC), building management system, water services and low/zero carbon (LZC) technologies.
- Part 3 Local Services: Lighting (fittings, systems and controls), local ventilation, heating and cooling; point of use water heaters.

The development is targeting a BREEAM 'Excellent' rating as a minimum to align with Railpen's ESG targets and exceed the 'Excellent' rating required under local planning policy. The current anticipated baseline score is 81.50% which is equivalent to a BREEAM 'Excellent' rating, with a 11.50% margin above the threshold. The current potential score for the project is 90.95% which is equivalent to a BREEAM 'Outstanding' rating with a 5.95% margin above the threshold.

The pre-assessment currently targets the following score / rating:

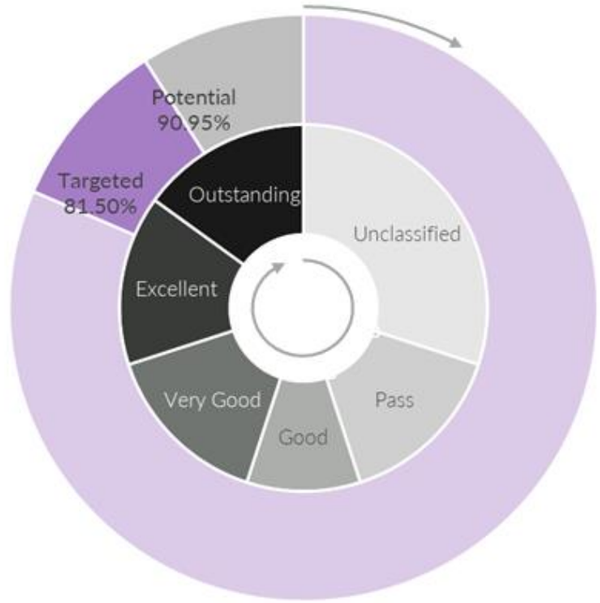
- BREEAM Score Targeted: 81.50%
- BREEAM Score Potential: 90.95%
- Target BREEAM Rating: 'Outstanding'
- Potential BREEAM Rating: 'Outstanding'

The minimum 70% required for BREEAM 'Excellent' is exceeded by 11.50%. As the design develops the project team will be actively aiming to increase the score and enable the aspirational target of BREEAM 'Outstanding' to be achieved.

8.1 Potential Credits

A margin of 3-5% is recommended to account for changes during the design & construction, therefore, to achieve an 'Outstanding' rating which accommodates this margin, a number of additional credits have been identified as potential. The following are recommended to be reviewed against current performance.

- Hea 01: Visual Comfort, Daylighting analysis (+0.84-1.68%)
  Action: Daylight consultant to review if current design meets requirements for an additional 1 or 2 credits.
- Ene 01: Reduction of Energy Use & CO_2 Emissions, Energy assessment (+0.71-1.42%)
  Action: Energy model will be continually reviewed as design progresses to confirm if additional credits can be targeted.
- Wat 01: Water Consumption, Specification of sanitaryware (+0.82%)
- Mat 03: Responsible Sourcing of Materials, Specification of responsibly sourced materials (+1.19%) *Action: Architect to review responsible sourcing requirements and consider specifying materials with compliant responsible sourcing certificates.*



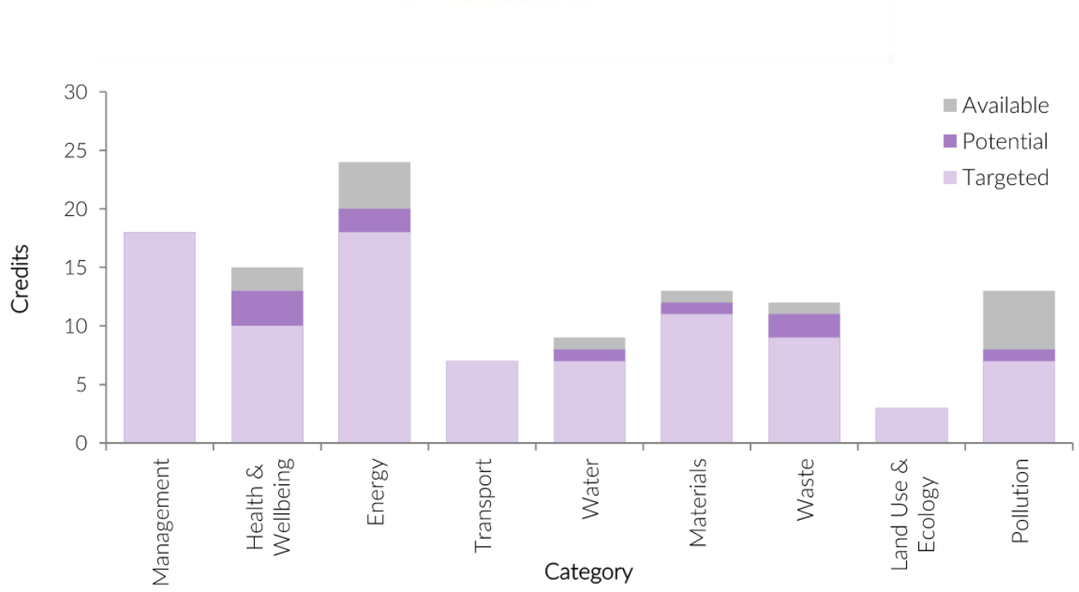


Figure 18: BREEAM 2014 scale and anticipated performances

8.2 Summary Score Sheet

The summary table below highlights the list of targeted credits for the current Bespoke BREEAM 2014 Refurbishment and Fit out (RFO) pre-assessment. Mandatory credits to achieve a 'Very Good' rating and above are highlighted by (M_v). Mandatory credits to achieve an 'Excellent' rating and above are highlighted by (M_e). Mandatory credits to achieve an 'Outstanding' rating and above are highlighted by (M_o).

Additional performance credits are available for some credit issues, and where these were deemed applicable to the development, they have been indicated by a plus sign, e.g. +1.

Table 11: BREEAM UK RFO 2014 Consultant Appointments/Scope

Category	Issue	Credits		
		Available	Targeted	Potential
Management	Man 01: Project Brief and design	4	4	-
	Man 02: Lifecycle Cost and Service Life Planning	4	4	-
	Man 03: Responsible Construction Practices (M_e) (M_o)	6	6	-
	Man 04: Commissioning and Handover (M_e) (M_o)	4	4	-
Health & Wellbeing	Hea 01: Visual Comfort	6	2	+3
	Hea 02: Indoor Air Quality	3	2	0
	Hea 04: Thermal Comfort	3	3	-
	Hea 05: Acoustic Performance	2	2	-
	Hea 06: Safety and Security	1	1	-
Energy	Ene 01: Reduction of Energy Use & CO_2 Emissions (M_e) (M_o)	15	10	+2
	Ene 02: Energy Monitoring (M_v) (M_e) (M_o)	2	2	-
	Ene 03: External Lighting	1	1	-
	Ene 04: Low Carbon Design	3	2	0
	Ene 06: Energy Efficient Transportation Systems	3	3	-
Transport	Tra 01: Public Transport Accessibility	3	3	-
	Tra 02: Proximity to Amenities	1	1	-
	Tra 03: Cyclist Facilities.	2	2	-
	Tra 05: Travel Plan	1	1	-
Water	Wat 01: Water Consumption (M_v) (M_e) (M_o)	5	3	+1
	Wat 02: Water Monitoring (M_v) (M_e) (M_o)	1	1	-
	Wat 03: Water Leak Detection and Prevention	2	2	-
	Wat 04: Water Efficient Equipment	1	1	-
Materials	Mat 01: Life Cycle Impacts	6	6	-
	Mat 03: Responsible Sourcing of Materials (M_v) (M_e) (M_o)	4	2	+1
	Mat 04: Insulation	1	1	-
	Mat 05: Designing for Durability and Resilience	1	1	-
	Mat 06: Material Efficiency	1	1	-
Waste	Wst 01: Project Waste Management (M_o)	7	5	0
	Wst 02: Recycled Aggregates	1	1	0
	Wst 03: Operational Waste (M_e) (M_o)	1	1	-
	Wst 04: Speculative Finishes	1	1	-
	Wst 05: Adaptation to Climate Change	1	1	-
	Wst 06: Functional Adaptability	1	1	-
Land Use and Ecology	LE 04: Enhancing Site Ecology	1	1	-
	LE 05: Long Term Impact on Biodiversity	2	2	-
Pollution	Pol 01: Impact of Refrigerants	3	2	0
	Pol 02: NOx Emissions	3	0	0
	Pol 03: Surface Water Run-off	5	3	1
	Pol 04: Reduction of Nighttime Light Pollution	1	1	-
	Pol 05: Noise Attenuation	1	1	-
Innovation	Man 03: Exemplary criteria	1	1	-
	Mat 01: Exemplary criteria	1	1	-
	Wst 01: Exemplary Credit	1	0	1
Targeted weighted score / rating:		81.50% 'Outstanding'		
Potential weighted score / rating:		90.95% 'Outstanding'		

9. Health and Wellbeing

9.1 WELL Building Standard

In line with the Applicant's sustainability aspirations, and the vision to create a modern workplace building with occupant health and wellbeing at the heart of design, WELL certification will be targeted with an aspiration to achieve WELL 'Platinum' rating, the highest level of certification possible.

WELL is the first standard of its kind to focus solely on the health and wellness of the building occupants. The aspiration is to create optimised spaces to promote health, enjoyment and productivity in a holistic and balanced way and therefore the WELL Building Standard (WELL) is being used as a health and wellbeing design framework for the project.

WELL Core is specific to core and shell buildings seeking to implement fundamental features in the base building for the benefit of tenants. All building types can pursue WELL Core certification provided that the owner occupies 25% or less of the gross floor area of the project, with the remainder of the space occupied by tenants.

WELL Core requires, at minimum, achievement of certain features directed at common areas and spaces under owner control. Some features must be achieved for the entire building for the WELL Core project to receive credit. WELL Core projects may earn additional points for achieving those same features for tenants, whether by directly offering benefits to tenants or sizing for tenant capacity.

Given the scope of the project, a "WELL Core" assessment is currently considered the most appropriate assessment route.

Through design workshops, a pre-assessment has been produced identifying that the development is targeting a WELL 'Platinum' rating as a minimum to align with Railpen's ESG targets. The current anticipated baseline score is 82 which is equivalent to a WELL Platinum rating, with a 2-point margin above the threshold.

Additional points have been identified to further increase the score to create a suitable margin over the minimum 80 points required for a WELL 'Platinum' rating, the highest level of certification possible.

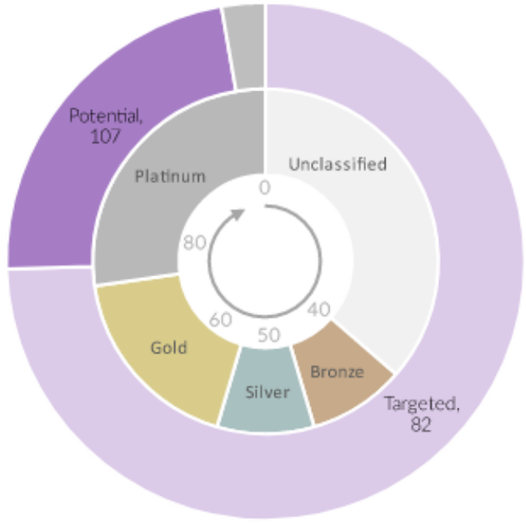


Figure 19: WELL v2 scale and anticipated performance

Appendix A – WLC Assumptions.

To account for uncertainties adopted RICS WLC PS 2nd edition recommends applying contingency factors. These help in early design stages with limited data. For this assessment, it is recommended that the results are viewed with a 15% margin of error, recognising the level of detail expected to be captured at Stage 3. This margin will be refined as the project enters the detailed design and construction phases.

Table 12 Default Material Specification for UK Projects, used in the absence of detailed information (RICS 2024)

Material	Details	Specification
Concrete	Piling	C32/40, 25% cement replacement
	Substructure	C32/40, 25% cement replacement
	Superstructure	C32/40, 25% cement replacement
Steel	Reinforcement bars	UK CARES sector average (EAF production, typically 96% recycled content in UK)
	Structural Steel sections	Structural open rolled steel sections, UK average (IStructE)
	Studwork/Support frames	Galvanised Steel, 15% Recycled Content
Blockwork	Precast Concrete blocks	Lightweight blocks for building envelope
		Dense blocks for other uses
Timber	Manufactured Structural Timber (CLT, Glulam etc.)	100% FSC/PEFC
	Formwork	Plywood
	Studwork/Framing/Flooring	Softwood
Plasterboard	Partitioning/Ceilings	FGD gypsum plasterboard (approximately 10% recycled content)

Table 13 Refrigerant leakage rates as of CIBSE TM65

Product	Annual leakage rate	End of life recovery rate
Package heat pump or chiller, where no refrigerant is managed on site	2%	99%
Heat pump or chiller where some works to refrigerant pipework are carried out on site	4%	98%
VRF systems where a large amount of refrigerant pipework is installed and filled on site.	6%	97%

Table 14 Default Transport Distances for UK Projects (RICS 2024)

Transport Scenario	km by road	km by sea
Locally manufactured e.g. concrete, aggregate	20	-
Nationally manufactured e.g. plasterboard, blockwork, insulation	120	-
European manufactured e.g. CLT, façade modules, carpet	1,500	100
Globally manufactured e.g. specialist stone cladding	500	10,000

Table 15 Default component lifespans (RICS 2024)

Building part	Building element	Expected lifespan
Roof	Roof covering	30
Superstructure	Internal partitions and linings	30- 60 years
Finishes	Wall finishes: Render/Paint	30/5
	Floor finishes: Raised Access Floor/Finish layers	50/30
	Ceiling finishes: Substrate/paint	10
FF&E	Furniture and fittings	10
Services/MEP	Heat source	20
	Space heating/ air treatment	20
	Ductwork: Galvanised/plastic	40/15
	Electrical installations	30
	Lighting fittings	15
	Communications installations/ controls	15
	Water and disposal installations	25
	Sanitaryware	20
	Lift and conveyor installations	20
Façade	Opaque modular cladding, e.g. rainscreen, timber panels	30
	Glazed cladding/ curtain walling	35
	Windows and external doors	30

Table 16 Default End-of-Life Scenarios (OneClick LCA)

Material group	End of life scenario	Materials included	C3 – C4, waste processing and landfilling	D, recycling benefits
Mineral building materials	Recycling for ground works	Concrete*, Cement*, Bricks, Porcelain, Plaster, Clay products, Stone, Ceramics, Asphalt	C3: Construction waste preparation for recycling	Recycling benefit from replacing the primary gravel
Metals	Metal preparation and recycling**	Aluminium, Steel, Stainless steel, Galvanized steel, Copper coated, Copper uncoated, Brass, Zinc, Lead	C3: Metal waste preparation	Recycling benefits for replacing virgin metal
Biobased materials with heating value	Incineration and energy recovery	Wood, Wood products	C3: Construction waste incineration for energy recovery	Recovered energy
Other materials with heating value	Incineration and energy recovery	Plastics	C3: Construction waste incineration for energy recovery	Recovered energy
Other materials that can be landfilled in construction waste site	Disposal / landfilling of inert material	Coatings, Synthetic materials, Panels and boards***, Insulating materials***, Glass, Window and façade components***	Disposal of inert construction waste	-

Appendix B – Terminology.

The following note provides a summary of key terminology commonly used when discussing life cycle assessments and accompanying works, and the definitions associated with each term.

Life Cycle Assessment (LCA)
A life cycle assessment is an overarching term used for assessing the environmental aspects associated with a product or asset over its life cycle. Common LCA scopes include embodied carbon, upfront carbon, and whole life carbon assessments.

Greenhouse gases (GHG)
'Greenhouse Gases' are constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. They are also referred to as 'carbon emissions' in general usage, carbon being the most common of the greenhouse gases.

Carbon dioxide equivalent (CO_{2e})
Greenhouse Gas emissions are often expressed as CO_2 equivalent (CO_2e or CO_2eq), a unit of measurement based on the relative impact of a given gas on global warming over a given time period. For example, over 100 years methane has a global warming potential of 28, or 1kg of methane has the same impact on climate change as 28kg of carbon dioxide and thus 1kg of methane would count as 28kg of CO_2e.

Building lifecycle modules
Building lifecycle modules are defined by BS EN 15978:2011 and determine the system boundaries of an assessment. The modules cover the whole life cycle of a building, from product stage (A1-A3) construction and transport (A4-A5) in-use (B1-B7), end of life (C1-C4) and benefits and loads beyond the system boundary (D).

Whole Life Carbon (WLC)
'Whole Life Carbon' emissions are the sum total of all asset-related GHG emissions and removals, both operational and embodied over the life cycle of an asset including its disposal (Modules: A1-A5; B1-B7 (plus B8 and B9 for Infrastructure only); C1-C4). Whole Life Carbon asset performance includes separately reporting the potential benefit from future energy recovery, reuse, and recycling (Module D).

Embodied carbon
The 'Embodied Carbon' emissions of an asset are the total GHG emissions and removals associated with materials and construction processes throughout the whole life cycle of an asset (Modules A1-A5, B1-B5, C1-C4).

Upfront carbon
'Upfront Carbon' emissions are the GHG emissions associated with materials and construction processes up to practical completion (Modules A1-A5). Upfront carbon excludes the biogenic carbon sequestered in the installed products at practical completion.

Operational carbon
Operational carbon is the GHG emissions arising from all the energy consumed (Module B6), water supply and wastewater treatment (Module B7) by the asset in-use, over its life cycle.

Carbon sequestration
Carbon sequestration is the process by which carbon dioxide is removed from the atmosphere and incorporated as biogenic carbon in biomass, through photosynthesis and other processes associated with the carbon cycle. In LCAs we typically consider sequestration when incorporating timber in buildings.

Environmental Product Declarations (EPDs)
An Environmental Product Declaration is a document which transparently communicates the environmental performance or impact of any product or material over its lifetime. EPDs are generated based on data obtained through a product level LCA in line with EN 15804, ISO 14025, or other related international standards.

EPDs support carbon emission reduction by making it possible to compare the impacts of different materials and products in order to select the most sustainable option and are used when undertaking asset level LCAs to illustrate carbon performance.

Net zero carbon – construction
When the amount of carbon emissions associated with a building's product and construction stages up to practical completion (Modules A1-A5) equals zero.

Net zero carbon – embodied
When the amount of carbon emissions associated with a building's product and construction stages throughout the whole life cycle of the asset (Modules A1-A5, B1-B5, C1-C4) equals zero.

Net zero carbon – operational energy
When the amount of carbon emissions associated with the building's operational energy (Module B6) on an annual basis is equals zero. A net zero carbon building is highly energy efficient and powered from on-site and/or off-site renewable energy sources, with any residual emissions offset.

Net zero carbon – whole life
When the sum total of all asset-related GHG emissions, both operational and embodied, over an asset's life cycle (Modules A1-A5, B1-B7, C1-C4) are minimized, meet local carbon, energy and water targets, and with residual emissions 'offset', equals zero

Appendix C – Whole life carbon assessment contingency.

When costing projects, it is common for contingencies to be used to reflect uncertainties. For WLC assessments, there are similar uncertainties, particularly during the early design phase when far less is known about the final design and materials. RICS v2, stipulates the consideration of contingency for the WLC based on uncertainties due to three different factors. This method consists of developing a WLCA contingency factor, which is generated from a three-factor approach:

- Contingency factor, based on project phase.
- Carbon data uncertainty factor, based on quality of carbon data of ten most impactful products or materials,
- Quantities uncertainty factor, based on the accuracy of quantities data of the same ten most impactful products.

These individual factors are added together to produce an overall contingency factor to be applied to the WLCA results.

Contingency factor based on project phase

A contingency factor, based on the project phase, is applied at during all project phases to modules A, B, C and D. It reflects uncertainty regarding the design of the asset, its construction and the quantities and types of materials used. It can be assessed for each element as their uncertainties may differ, or default values for the asset overall may be used. Uncertainty generally reduces as the project phases proceed and more is known and finalised. Default contingency factors provide in RICS v2 are listed in Table 17. A 6% contingency factor is selected to account for uncertainty within the Stage 3 design.

Table 17: RICS v2 default contingency factors based on project phase

Project Phase	Default contingency factor to apply to all life cycle stages and modules
Early design	15%
Technical design and construction	6%
Post-completion	0%

Carbon data uncertainty factor

During early design stages, it is best to use generic data to represent products and materials, as it is generally not clear the exact products that will be used, and from where and which manufacturers they will be sourced. There is therefore considerable uncertainty as to whether the dataset chosen will accurately represent the product that is finally selected, and it is therefore appropriate to use the carbon data uncertainty factor during the early design phase.

For each product, the product-stage dataset providing carbon data for A1–A3 should be assessed against each of the criteria for geographical, technological and temporal representativeness. The relevant points for each aspect should be added together for each dataset, with maximum points score of 40 for the least uncertain data (e.g. a recent EN 15804 EPD for the exact product and manufacturer used on the project) and a score of 0 for the least representative data with no verification.

Once the confidence score has been determined, the corresponding carbon data uncertainty factor percentage can be identified using Table 18 below.

Table 18: RICS v2 carbon data uncertainty factor scoring table

Asset carbon confidence score	≤10	10<15	15<20	20<25	25<30	30<35	35<40	40
Carbon data uncertainty factor	7%	6%	5%	4%	3%	2%	1%	0%

The carbon data uncertainty factor must be applied to all modules A–D before reporting upfront, embodied, operational and user carbon. The carbon data selected for this WLCA is fairly representative of the geography, technology, product specificity granularity and temporality, however some selections may be relevant to European products due to the wider availability of EPDs in France, hence the uncertainty factor of 3% was calculated for the development at this stage.

Quantities uncertainty factor

A quantities uncertainty factor for key products (the most impactful products and materials used) provides an indication of the uncertainty associated with the quantities used for the WLCA.

The quality of the quantities data must be assessed for each of the key products: the ten products or materials that cause the greatest impact for the asset using Table 19 below.

Table 19 RICS v2 quantity uncertainty levels (QUL) to assess quantities of key products

Quantities uncertainty levels (QULs)	QUL score	Examples
Very Good	0	Actual measured/delivered quantities
Good	1	Design measured/calculated/modelled average
Fair	3	Estimated building information
Sufficient	5	Benchmark building information

Once the asset QUL score has been determined, then using Table 19, the corresponding percentage can be identified and added to the contingency factor and the carbon data uncertainty score to give the final WLCA uncertainty factor. Since this WLCA is based on the stage 1 refresh cost plan, hence a QUL score of 4 (ranging between Fair to Sufficient) was calculated for this assessment.

The total contingency factor to be applied to the WLCA is therefore a combination of the three factors calculated above (Table 20).

Table 20 Total contingency factor calculated for this WLCA

Calculation stage		%
Stage 1	Contingency factor based on project phase	6%
Stage 2	Carbon data uncertainty factor	5%
Stage 3	Quantities uncertainty factor	4%
Total:		15%

A total contingency percentage of15% has been applied to the WLCA results for the baseline and all subsequent scenarios evaluated.

Appendix D – Detailed Breakdown of Results.

Building element	A0	A1-A3 Sequestered Carbon	A1-A3 Product stage (excl. sequestered carbon)	A4	A5-1	A5-2	A5-3	A5-4	B1	B2	B3	B4	B6-electricity	B6-fuel/heating	B7	C1	C2	C3	C3-balancing	C4	C4-balancing	D	Total (excl. D)
0.1 Treatment, Demolition works & Facilitating works	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1.Substructure	0.00	0.00	2.65	0.33	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	0.00	-0.35	3.11
2.1. Frame	0.00	0.00	29.69	0.36	0.00	0.00	0.64	0.00	0.00	0.00	0.00	11.03	0.00	0.00	0.00	0.00	0.24	0.67	0.00	0.00	0.00	-17.96	42.62
2.2.Upper floor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.3.Roofs	0.00	-20.89	22.35	1.66	0.00	0.00	18.70	0.00	0.00	0.00	0.00	2.71	0.00	0.00	0.00	0.00	0.07	0.24	2.03	0.03	1.38	-2.33	28.28
2.4.Stairs, ramps and safety guarding	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.17	0.31
2.5.External envelope including roof finishes	0.00	-0.03	98.81	6.52	0.00	0.00	3.67	0.00	0.00	0.00	0.00	4.50	0.00	0.00	0.00	0.00	0.74	0.19	0.00	0.04	0.00	-9.40	114.43
2.6.Windows and external doors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2.7.Internal walls and partitions	0.00	-0.05	19.28	1.30	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.21	0.02	0.01	0.00	0.00	-4.82	21.58
2.8.Internal doors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3.1.Wall finishes	0.00	-0.03	0.56	0.03	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	-0.01	1.27
3.2.Floor finishes	0.00	-22.11	55.28	13.61	0.00	0.00	5.08	0.00	0.00	0.00	0.00	74.72	0.00	0.00	0.00	0.00	0.72	1.30	21.30	0.00	0.00	-120.55	149.90
3.3.Ceiling finishes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4.Fittings, furnishings and equipment	0.00	-1.10	2.38	0.36	0.00	0.00	0.09	0.00	0.00	0.00	0.00	4.81	0.00	0.00	0.00	0.00	0.00	0.01	1.09	0.00	0.00	0.00	7.64
5.Services	0.00	-0.07	76.16	4.19	0.00	0.00	1.98	0.00	31.48	0.00	0.00	78.51	0.00	0.00	0.00	9.70	0.33	0.05	0.02	0.01	0.00	-50.25	202.37
6 Prefabricated Buildings and Building Units	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.Work to existing building	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8.External Works	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operational energy and water use	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	507.47	0.00	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	508.85
Not classified	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	-44.28	307.47	28.35	0.00	0.00	30.66	0.00	31.48	0.00	0.00	177.37	507.47	0.00	1.38	9.70	2.36	2.48	24.44	0.08	1.38	-205.84	1080.35

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Appendix. iv
Energy Strategy

HOARE LEA

26 Red Lion Square.
London.
Railway Pension Investments Limited.

SUSTAINABILITY
ENERGY STATEMENT

REVISION P03 – 11 DECEMBER 2024

Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
P01	08/11/2024	Draft for comments	M. Asimakis	G. Beghi	T. Spurrier
P02-01	29/11/2024	Second Draft	M. Asimakis		T. Spurrier
P03	11/12/2024	Updated following comments	L.Tennent		

Project number: 5425667
Document reference: 5425667-HLE-XX-XX-RP-ST-402026-26 Red Lion Square Energy Strategy-P02-01.docx

Contents.

Executive summary.

This energy strategy has been prepared by Hoare Lea on behalf of Railway Pension Investments Limited (hereafter referred to as 'the Applicant') in support of the planning application for the development at 26 Red Lion Square, London (hereafter 'the Proposed Development') within the London Borough of Camden.

Development description.

"Refurbishment and recladding of existing building with extension at fourth floor adjacent to Theobalds Road and associated works"

Table 1: Area schedule.

Space Use	NIA m^2	GIA m^2
EXISTING		
Existing Office (incl. atrium infill)	9,902	13,465
PROPOSED		
Offices	9.334	13,552

Figure 1: Illustrative view of the Proposed Development

1.1 Applicable policy and regulations.

The proposed development at 26 Red Lion Square, London is a minor development and therefore is not required to comply with the majority of Regional Planning Policies included in the London Plan (2021) and the Greater London Authority's (GLA's) Energy Assessment Guidance (2022) as these refer mainly to major developments. to demonstrate the Applicant's commitment to energy and sustainability, an approach similar to the one suggested by the GLA is followed.

On a local level, the Planning Policies of the London Borough of Camden have been reviewed and all policies related to minor developments have been complied with. Similarly, the majority of the local planning policy relates to major developments.

With respect to energy and carbon performance, this project must comply with the following policies and regulations:

National drivers; Approved Document Part L of the Building Regulations
Part L of the Building Regulations is the mechanism by which government is driving reductions in the regulated CO_2 emissions from new buildings. The assessment of the Proposed development against policy targets has been carried out using Building Regulations Part L2 (2021).

Calculations demonstrating the energy requirements and associated CO_2 emissions for the development have been carried out using Building Regulations approved software.

Local Authority Local Plan
The proposed development is subject to the following local plan policies and CPGs :
Camden Local Plan - Adopted 2017
Energy Efficiency and Adaptation CPG – January 2021
Design CPG – January 2021
Draft New Camden Local Plan – (January 2024 version)
–
To demonstrate the Applicant's commitment to energy and sustainability, an approach similar to the one required by the GLA is followed. As a result, the proposed development considers the following Regional Policies, however, due to being a minor development compliance is not required.

Regional drivers; Greater London Authority (GLA) Policy and London Plan
Despite being a 'Minor' development, the Energy Strategy follows the Mayor's Sustainable Infrastructure policies and the energy hierarchy: 'Be Lean, Be Clean, Be Green, Be Seen' as detailed in the Greater London Authority (GLA) London Plan (2021).

- Policy SI2: Minimising greenhouse gas emissions
  - Energy Hierarchy
- Policy SI3: Energy Infrastructure
- Policy SI4: Managing Heat Risk
- Policy GG6: Increasing efficiency and resilience

Table 2 below provides a summary of the National, Regional and Local Planning Policies compliance requirements.

Table 2 Summary of Planning Policies Compliance Requirements

Policy Document	Compliance Required	Compliance not Required but has been considered in the design
Building Regulations Part L2 2021	Yes	
Camden Local Plan (2017)	Yes	
Energy Efficiency and Adaptation CPG (2021)	Yes	
Design CPG (2021)	Yes	

Policy Document	Compliance Required	Compliance not Required but has been considered in the design
London Plan (2021)		Yes
GLA Energy Assessment Guidance (2022)		Yes
Draft New Camden Local Plan		Yes

The Proposed Development consists of both renovation and newly built elements, however, due to the extension being minor the proposed development has been assessed as a refurbishment in full.

Energy strategy results

Sitewide Results

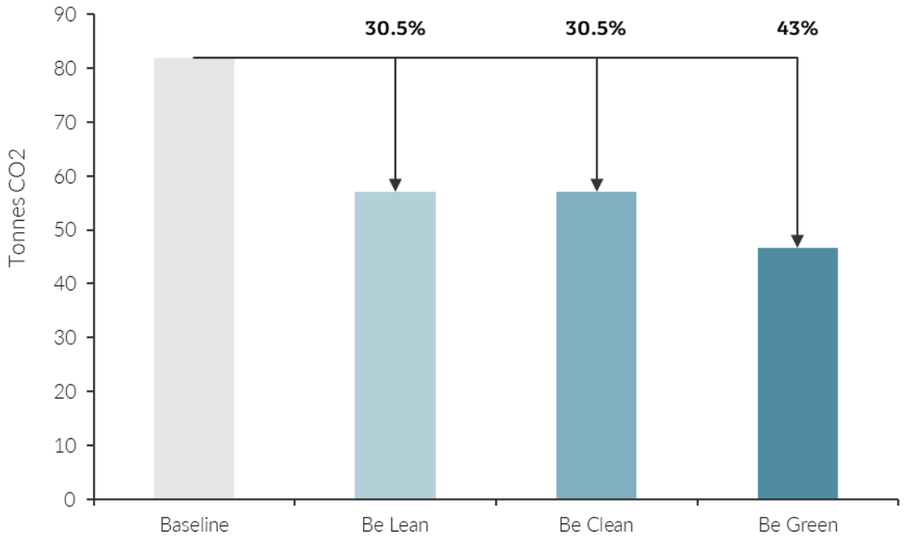

Figure 2: Sitewide carbon reduction summary

Table 3: Energy Strategy Summary Table

	Site-Wide Regulated Carbon Dioxide Emission Savings (tonnes CO_2/yr.)	
	Regulated	Unregulated
Baseline: GLA Energy Guidance Appendix 3 For Existing Buildings	82	75.3
After energy demand reduction (Be Lean)	57	75.3
After heat network / CHP (Be Clean)	57	75.3
After renewable energy (Be Green)	47	75.3
	Site-Wide Regulated non-domestic carbon dioxide savings	
	(tonnes CO_2/yr.)	(%)
Savings from energy demand reduction	25	30.5%
Savings from heat network / CHP	0	0.0%
Savings from renewable energy	10	12.5%
Cumulative on-site savings	35	43.0%

Be lean.

Sitewide
Improvement against the GLA Refurbishment Baseline, based on Energy Assessment Guidance Appendix 3, at each stage of the energy hierarchy.
No specific numerical target for Minor Developments

- 30.5% reduction over baseline
- Appendix A details the target fabric and system performance parameters

Be clean.

Sitewide
No requirement for Minor Developments

- No further reduction over baseline
- There are no existing or planned district energy networks within feasible vicinity of the site that would enable a connection to the Proposed Development, nor are there currently any feasible future connections planned

Be green.

Sitewide
Improvement against the GLA Refurbishment Baseline.
No specific numerical target for minor developments

- 43% reduction over baseline
- Air source heat pumps will provide space heating, cooling, and hot water for the office areas.
- 56m^2 solar photovoltaic array proposed at roof level.

Be Seen

Sitewide
Target: disclosure of the development's energy use

- GLA's be seen webform has been submitted as part of the planning application.
- An updated "as built" be seen webform is to be submitted during RIBA Stage 6.

The development will include the necessary metering, energy monitoring and data processes to facilitate the annual reporting requirements.
–

Table 4: Energy Strategy Summary Table

	Site-Wide Regulated Carbon Dioxide Emission Savings (tonnes CO_2/yr.)	
	Regulated	Unregulated
Baseline: GLA Energy Guidance Appendix 3 For Existing Buildings	82	75.3
After energy demand reduction (Be Lean)	57	75.3
After heat network / CHP (Be Clean)	57	75.3
After renewable energy (Be Green)	47	75.3
	Site-Wide Regulated non-domestic carbon dioxide savings	
	(tonnes CO_2/yr.)	(%)
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Savings from heat network / CHP	0	0.0%
Savings from renewable energy	10	12.5%
Cumulative on-site savings	35	43.0%

2. Introduction.

This energy strategy has been prepared by Hoare Lea on behalf of Railway Pension Investments Limited (hereafter referred to as 'the Applicant') in support of the planning application for the development at 26 Red Lion Square, London (hereafter 'the Proposed Development') within the London Borough of Camden.

2.1 The proposed development

Location: 26 Red Lion Square, Holborn, London WC1R 4HQ

Local Authority: London Borough of Camden

"Refurbishment and recladding of existing building with extension at fourth floor adjacent to Theobalds Road and associated works"

Table 5: Area schedule.

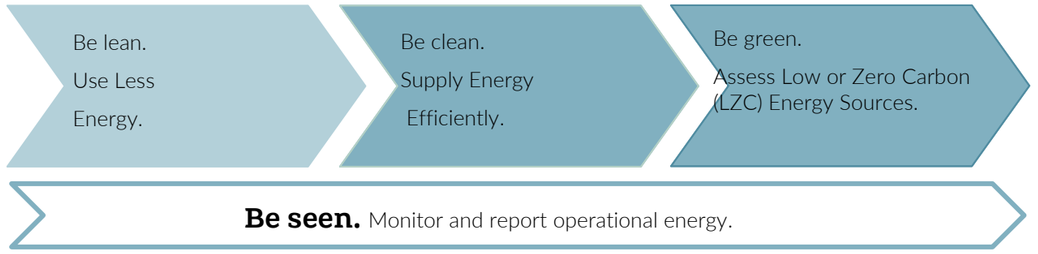
Space Use	NIA m^2	GIA m^2
EXISTING		
Existing Office (incl. atrium infill)	9,902	13,260
PROPOSED		
Offices	9,319	13,459

Figure 3 Proposed development. Source: Stiff+Trevillion

2.2 Approach to the strategy

This energy statement proposes recommendations regarding the approach to reducing carbon dioxide (CO_2) emissions and optimising energy efficiency within the development. This strategy summarises the pertinent regulatory and planning policies applicable to the Proposed Development, and sets targets commensurate with these policies, which the Proposed Development will seek to achieve.

The Energy Strategy has been developed using a 'fabric first' approach through the 'be lean', 'be clean', 'be green' energy hierarchy.



After 'Be green' an additional stage of the energy hierarchy has been introduced: 'Be seen' - monitor, verify and report on energy performance in-use. The 'be seen' stage endorses the disclosure of the Proposed Development's energy use with annual energy consumption being displayed on a public online platform accompanied by the predicted energy performance at the design stage.

This approach will demonstrate how developments are performing in-use and will underpin progress in reducing carbon emissions, operational running costs and will encourage the industry's route to achieving zero carbon buildings.

2.3 Definitions and limitations

Definitions:
The following definitions should be understood throughout this statement:

- Energy demand: the 'room-side' amount of energy which must be input to a space to achieve comfortable conditions. In the context of space heating, this is the amount of heat which is emitted by a radiator, or other heat delivery mechanism.
- Energy requirement: the 'system-side' requirement for energy (fuel). In the context of a space heating system using a gas boiler, this is the amount of energy combusted (e.g. gas) to generate useful heat (i.e. the energy demand).
- Regulated CO_2 emissions: the CO_2 emissions emitted as a result of the combustion of fuel, or 'consumption' of electricity from the grid, associated with regulated sources (those controlled by Part L of the Building Regulations).
- Unregulated CO_2 emissions: the CO_2 emissions emitted as a result of the combustion of fuel, or 'consumption' of electricity from the grid, associated with unregulated sources (those not controlled by Part L of the Building Regulations) e.g., server rooms, tenant IT equipment, lifts, kitchen equipment etc.

Disclaimer
The appraisals within this statement are based on Part L calculation methodology and should not be understood as a predictive assessment of likely future energy requirements or otherwise. Occupants may operate their systems differently, and / or the weather may be different from the assumptions made by Part L approved calculation methods, leading to differing energy requirements.

3. Drivers

3.1 National policy.

Building Regulations: Approved Document Part L
Approved Document Part L (2021, England edition), here forward referred to as ADL 2021, is the Building Regulation relating to the conservation of fuel and power in buildings. ADL 2021 has two parts, Part L1 relates to dwellings and Part L2 relates to buildings other than dwellings.

All new buildings must now meet the requirements of Part L (2021) unless captured by the traditional arrangements associated with the ability to use older versions of the regulations. All new buildings must meet the requirements of Part L1 (Domestic – Dwellings) or Part L2 (Non-Domestic).

The proposed development will be assessed in accordance with criteria set out in Part L2.

Building Regulations Part L states that reasonable provisions shall be made for the conservation of fuel and power in building by:

Limiting heat gains and losses:

- through thermal elements and other parts of the building fabric; and
- from pipes, ducts and vessels used for space heating, space cooling and hot water services.

Providing fixed building services which:

- are energy efficient.
- have effective heat controls; and
- are commissioned by testing and adjusting as necessary to ensure they use no more fuel and power than is reasonable in the circumstances.

The proposed development will be assessed in accordance with criteria set out in Part L2.

Demonstrating compliance – Part L2.

To demonstrate compliance with Part L, Volume 2, there are a number of regulations which must be met. Regulation 25 through to 26C detail the required energy performance of the new building.

Table 6: Part L2 Criteria.

Regulation 25A	Minimum energy performance requirements for new buildings These requirements are in the form of a target primary energy rate and a target emission rate.
Regulation 25B	Nearly zero-energy requirements for new buildings Where a building is erected, it must be a nearly zero-energy building
Regulation 26	CO_2 Emission rates for new buildings Where a building is erected, it shall not exceed the target CO_2 emission rate (TER) for the building
Regulation 26C	Target Primary Energy rates for new buildings Where a building is erected, it must exceed the target primary energy rate (TPER) for the building

3.2 Regional policy.

Greater London Authority (GLA) Policy
The following summarises the relevant policies to the application relating to energy and CO_2 emissions. Since the proposed development is not considered a Major Development, the policies stated in the London Plan and the GLA Energy Assessment Guidance are not required to be complied with. However, to highlight the Applicants commitment to Energy and Sustainability, these policies have been considered in the design of the Proposed Development.

London Plan (2021)

London Plan (2021)	
Policy SI 2: Minimising Greenhouse Gas Emissions	Major development should be net zero-carbon – reducing greenhouse gas emissions and energy demand in accordance with the 'Be Lean – Be Clean – Be Green – Be Seen' energy hierarchy. A minimum on-site reduction of at least 35% beyond Building Regulations Part L (2013) Target Emissions Rate (TER). New build Residential development should achieve 10% and non-residential development should achieve 15% through energy efficiency measures. Any shortfall should be provided through a carbon offset payment to the relevant borough.
Policy SI 3: Energy Infrastructure	Major development within Heat Network Priority Areas should have a communal low-temperature heating system where the heat source for the system is selected in accordance with the following heating hierarchy: a. Connect to local existing or planned heat networks b. Use zero-emission or local secondary heat sources (in conjunction with heat pump if required) c. Use low-emission combined heat and power (CHP) d. Use ultra-low NOx gas boilers
Policy SI 4: Managing Heat Risk	Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure. B Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy: 1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure 2) minimise internal heat generation through energy efficient design 3) manage the heat within the building through exposed internal thermal mass and high ceilings 4) provide passive ventilation 5) provide mechanical ventilation 6) provide active cooling systems.

Energy Assessment Guidance (June 2022)
The new Energy Assessment Guidance aligns with the London Plan (2021) and provides further guidance on the methodology required to demonstrate compliance with the London Plan (2021).

Key policy summary for the Proposed Development

Development type	Energy Hierarchy Stage	Target
Refurbishment elements of the proposed development	All Stages	Improvement against a GLA Refurbishment Baseline, based on Energy Assessment Guidance Appendix 3, at each stage of the energy hierarchy. No specific numerical target for improvement but "...every effort should be made to improve the energy performance of the building in line with London Plan carbon targets and to follow the energy hierarchy." (6.25)

Relevant clauses from the GLA Energy Assessment Guidance (June 2022) regarding refurbishments can be found in the table below:

Clause	Description
6.15	Where an existing building or group of buildings is refurbished and the development qualifies as a major refurbishment , applicants are required to provide an energy assessment demonstrating how the individual elements of the energy hierarchy have been implemented and how reductions in regulated CO2 emissions have been achieved.
6.17	Development proposals are required to evaluate the feasibility of Combined Heat & Power (CHP) systems and where a new CHP system is appropriate, examine opportunities to extend the system beyond the Site boundary. Where future network opportunities are identified, proposals should provide a reduction in expected CO_2 emissions through the use of on-site renewable energy generation, where feasible.
6.18	Policy 5.7 requires that developments should provide a reduction in expected CO_2 emissions through the use of on-site renewable energy generation, where feasible.
6.21	Once the baseline has been established, applicants will be expected to demonstrate that they have incorporated improvement measures that maximise performance at each stage of the energy hierarchy.
6.22	The BER of the refurbished building should be determined following improvements at each stage of the energy hierarchy using Building Regulations compliance software. These figures should then be used to report the CO2 savings at each stage of the energy hierarchy in the carbon emissions reporting spreadsheet and included in the energy assessment.
6.23	The performance values used to calculate the CO2 emission improvements at each stage of the energy hierarchy should also be outlined. In addition, confirmation should be provided of the source of the assumptions for the improvements in building elements or services, including specific U-value calculations for proposed build-ups, manufacturer's datasheet etc.
6.24	The developer is required to report how the proposed improvement measures compare with the notional specification for existing buildings in Appendix 3. To meet the GLA's carbon reduction target it is expected that applicants will exceed these standards. It is acknowledged that the Approved Documents allow for flexibility in meeting the recommended standards due to potential restrictions to building work upgrades, for instance listed building status or heritage projects. Therefore, any limitations in meeting these recommended standards should be stated.
6.25	It is generally acknowledged that the level of carbon savings that can be achieved through a refurbishment can vary considerably, however every effort should be made to improve the energy performance of the building in line with London Plan carbon targets and to follow the energy hierarchy.

Local policy.
Local Plans
The proposed development is subject to the following local plans:

Camden Local Plan (2017)

Policy	Description
CC1	The Council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation. Given the significant contribution existing buildings make to Camden's CO2 emissions, the Council will support proposals that seek to sensitively improve the energy efficiency of existing buildings. We will expect all developments, whether for refurbishment or redevelopment, to optimise resource efficiency by: reducing waste. reducing energy and water use during construction. minimising materials required. using materials with low embodied carbon content; and enabling low energy and water demands once the building is in use.
CC2	The Council will require development to be resilient to climate change. All development should adopt appropriate climate change adaptation measures such as: • the protection of existing green spaces and promoting new appropriate green infrastructure. • not increasing, and wherever possible reducing, surface water run-off through increasing permeable surfaces and use of Sustainable Drainage Systems. • incorporating bio-diverse roofs, combination green and blue roofs and • green walls where appropriate; and • measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy. Any development involving 5 or more residential units or 500 sqm or more of any additional floorspace is required to demonstrate the above in a Sustainability Statement.

Draft Camden New Local Plan (January 2024 version)

Policy	Description
CC1	The Council will prioritise the provision of measures to mitigate and adapt to climate change and require all development in Camden to respond to the climate emergency by: 1. Supporting the retrofitting of existing buildings to make them more energy efficient and reduce the energy needed to occupy the building. 2. Prioritising and enabling the repurposing and re-use of existing buildings over demolition. 3. Following circular economy principles, minimising waste and increasing re-use. 4. Reducing whole life carbon emissions, by taking a whole life carbon approach, considering both embodied carbon and operational carbon. 5. Being designed and constructed to be net zero carbon in operation. 6. Utilising low carbon technologies and maximising opportunities for renewable energy generation, and heat networks. 7. Being designed to be resilient to climate change and meet the highest standards of sustainable design and construction. 8. Minimising the risk of overheating through design and avoiding reliance on air conditioning. 9. Improving water efficiency. 10. Minimising and avoiding the risk of flooding from all sources and incorporating multifunctional Sustainable Urban Drainage Systems (SuDS) to reduce surface water run-off. 11. Protecting and enhancing existing green spaces and water sources, enhancing biodiversity, strengthening nature recovery and providing multi-functional green infrastructure; and Prioritising sustainable transport.
CC2	The Council will seek to ensure that the repurposing, refurbishment, and re-use of existing building/s is prioritised over demolition. Where sites include existing building/s, applicants will be required to undertake a condition and feasibility assessment, to understand the re-use potential of the existing buildings and explore the best use of the site. This should be undertaken at the earliest opportunity, as part of the design process. Taking into account the findings of the condition and feasibility assessment, applicants will be required to demonstrate that alternative development options (such as retrofit, re-use, refurbish, substantial refurbishment and extension) have been fully explored. Applicants should discuss the findings of the condition and feasibility assessment and the assessment of alternative development options (as set out in criteria B and C above) with the Council, at the earliest opportunity, before progressing the design of any scheme. The Council will only permit proposals that involve the partial or substantial demolition of existing building/s, where it can be demonstrated to the Council's satisfaction that: The applicant has comprehensively explored a range of alternative envelopment options, informed by the condition and feasibility assessment, prior to considering full or partial demolition. The proposal constitutes the best use of the site, when considered against alternative options involving the retention, repurposing, refurbishment and/or re-use of the existing building/s. Where it is demonstrated to the Council's satisfaction that the partial or full demolition of existing building/s is justified, the applicant will be required to submit a pre-demolition audit. This should demonstrate that the re-use of materials has been explored on site;

Policy	Description
	identify all materials within the building and document how they will be managed; show how building material waste will be minimised; and demonstrate that circular economy principles have been applied in accordance with Policy CC3 Circular Economy and Reduction of Waste.
CC5	The Council will support adaptations and improvements to existing buildings to make them more energy efficient and reduce the energy needed to occupy the building. The Council will: a. Require all development proposals for the alteration, extension and/or conversion of an existing building (including where an element of demolition is proposed) to demonstrate how they have considered and will implement energy efficient improvements. This should be detailed in the Sustainability Statement. b. Expect energy efficient improvements to be made appropriate to the scale or nature of the proposal. c. Expect energy demand in the part of the building being altered/ extended and/or converted, to primarily be reduced through improvements to the building fabric. These improvements should comply with the U values set out in Table 6 in the supporting text below. d. Require proposals that include the addition or replacement of 500sqm floorspace or more; or developments providing one or more additional dwellings through conversion and / or additional floorspace to: i. reduce the amount of energy required to heat the building/s over a year, as far as possible, to meet a space heating demand of 50 kwh/m2/year. Proposals within a conservation area or related to a listed building may be provided an additional allowance of 10 - 20 kWh/m2 where it is demonstrated to the Council's satisfaction that the above target of 50 kwh/m2/year cannot be met. ii. be fossil fuel-free and use low carbon heat. iii. demonstrate to the Council's satisfaction that it has maximised the generation of renewable energy on-site (through solar photovoltaics (pv), as far as practical; and iv. Submit an energy statement to demonstrate how the proposal complies with the criteria above. e. Encourage all other proposals for the alteration, extension and/or conversion of an existing building (not specified in A(iv)) to also meet the standards set out in A(iv) a, b, c and d above. f. Require proposals that include substantial demolition but retain part of the building to use as little energy as possible and meet an Energy Use Intensity target of 50 kWh/m2/year for residential uses. In instances where minimal existing built fabric is retained (i.e. basement; foundations; a façade; small part of the superstructure) the Council will require the development to meet all energy reduction criteria for new buildings set out in Policy CC6.
CC8	1. The Council will ensure that development is designed to minimise overheating and promote cooling. The Council will: a. Support proposals which seek to adapt and improve existing buildings, to improve ventilation, and address overheating and promote cooling, where they are in accordance with the other policies in this Plan. b. Require all development to minimise the adverse impacts of overheating through the application of the London Plan cooling hierarchy. Applicants should include information demonstrating that the risk of overheating has been mitigated through the incorporation of design measures in the Sustainability Statement.

Policy	Description
	c. Resist applications that include active cooling (air conditioning) and non-essential mechanical plant. Applications for new build development that include active cooling will only be permitted where dynamic thermal modelling demonstrates there is a clear need for it and other passive measures have been integrated into the development. Applications for existing non-residential buildings will need to demonstrate there is a clear need for additional, or replacement, active cooling equipment and that other passive measures have been integrated. Where need is demonstrated to the Council's satisfaction, the Council will also require the carbon used to operate the system to be offset through the installation of solar photovoltaics. d. Require applicants to incorporate measures to cool buildings through the use of materials and finishes. The Council will expect materials and finishes to have the ability to reflect sunlight. e. Require applicants to incorporate measures to cool the spaces around and between buildings using appropriate materials, finishes, and greening. Trees should provide adequate canopy cover for greater cooling effect.

4. Assessment Methodology

The following is a summary of the data used and inputs / assumptions made for simulation geometry modelling.

4.1 Site Context

The site, highlighted below, is located in the south of the London Borough of Camden, close to the borders with Westminster and the City, and is bounded by Red Lion Square (South), Theobalds Road (North) and Old North Street (West). To the east the site abuts the neighbouring properties on Red Lion Square and Theobalds Road.

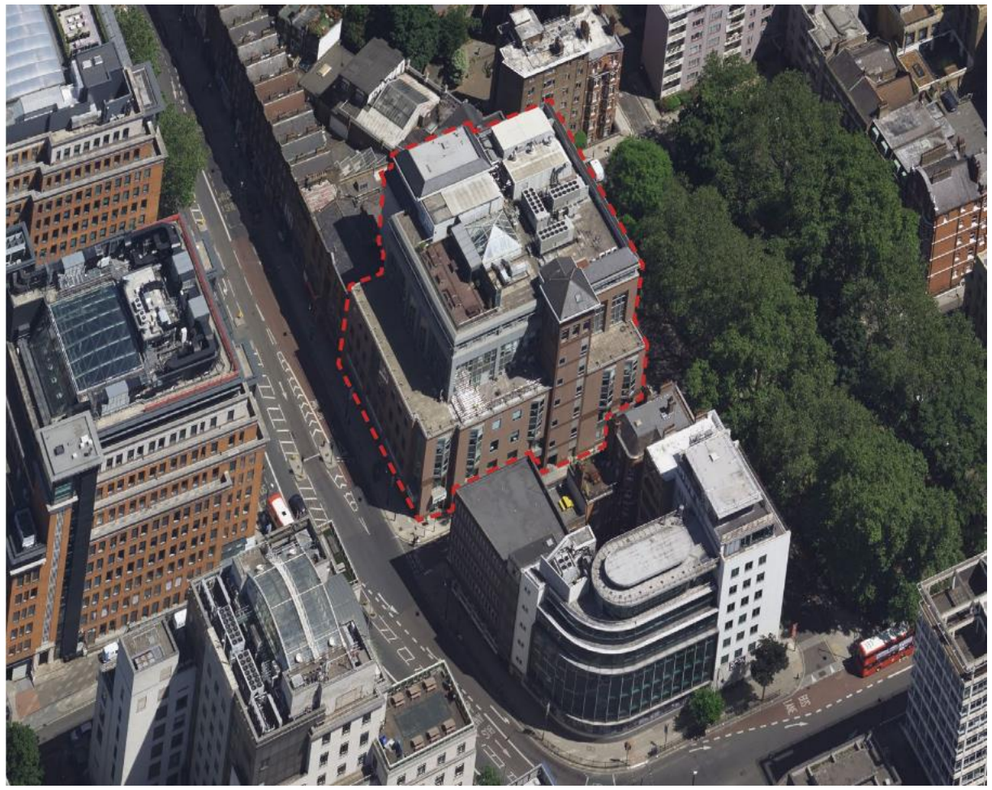


Figure 4: Location of the 26 Red Lion Square development with respect to the surrounding area.

4.2 Site location and weather data.

A building's thermal performance is its response to external environmental conditions. The more dependant a building is on passive features to achieve acceptable internal comfort, the more important the use of external weather information becomes.

Climate data is assigned to the virtual environment of the dynamic model to simulate external weather conditions that are likely to occur. Thermal comfort calculations require the simulation to be tested against CIBSE Design Summer Year (DSY) climate data in order to best assess how spaces will perform during a year with hot summer conditions.

The UK Meteorological Office (MO) collects weather data at stations across the UK. Climate variables measured at hourly intervals include air temperatures, wind speed and direction and air pressure amongst various other characteristics.

CIBSE licenses the historic weather data from the MO for 14 locations in the United Kingdom: Belfast, Birmingham, Cardiff, Edinburgh, Glasgow, Leeds, London (3 sites), Manchester, Newcastle, Norwich, Nottingham, Plymouth, Southampton and Swindon.

The weather variables are synthesised into 2 types of CIBSE weather file:

– Design Summer Year (DSY)

The DSY is a single continuous year rather than a composite one made up from average months.

The DSY is used for overheating analysis.

– Test Reference Year (TRY)

The TRY is composed of 12 separate months of data each chosen to be the most average month from the collected data.

The TRY is used for operational energy analysis and for compliance with the UK Building Regulations (Part L).

Following the standardised methodology behind the Part L requirements, the closest CIBSE weather file location for the proposed development is the London TRY (2016) and has been utilised for the purposes of these calculations.

4.3 Architectural drawings.

The geometry used to assess the proposed development was determined by the 'Stage 2 Pack' provided by Stiff and Trevillion.

Table 7: Architectural Information.

Drawing Type	Document Package	Date Received
Plans	Stage 2+ Pack	09/10/2024
Elevations	Stage 2+ Pack	09/10/2024

Dynamic Simulation Model.

Based on the architectural and building services information, Dynamic Simulation Models were created to undertake appropriate assessments on the proposed design.

Integrated Environmental Solutions Virtual Environment (IESVE 2023) is an approved Dynamic Simulations Modelling (DSM) software package that has the capabilities of enabling the user to create a virtual representation of a building.

Models built in the IESVE have been used to consider compliance with Approved Document Part L2 2021 using the National Calculation Methodology alongside the assessment of operational energy consumption.

A visualisation of the model including adjacent buildings (used for solar modelling) is shown below:

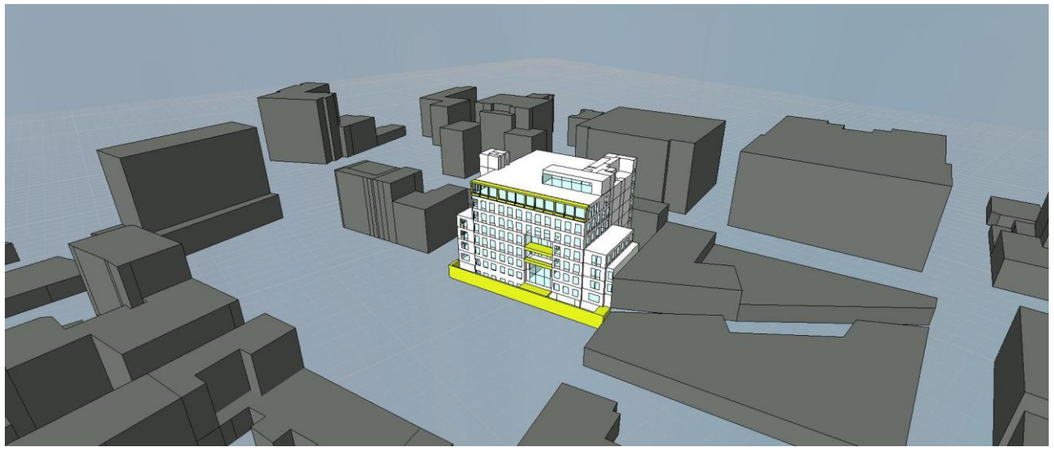


Figure 5: IESVE Model of 26 Red Lion Square.

Energy assessment approach – refurbishment

Energy assessment of the Proposed Development has been undertaken in line with the GLA's Energy Assessment Guidance (June 2022). This guidance outlines the assessment approach for refurbishments which is summarised in Table 8.

The Proposed Development consists of both renovation and newly built elements, however, due to the extension being minor the proposed development has been assessed as a refurbishment in full.

Table 8: GLA energy assessment methodology for refurbishments

Development type	Energy Hierarchy Stage	Target
Refurbishment elements of the proposed development	All Stages	Improvement against a GLA Refurbishment Baseline, based on Energy Assessment Guidance Appendix 3, at each stage of the energy hierarchy. No specific numerical target for improvement but "…every effort should be made to improve the energy performance of the building in line with London Plan carbon targets and to follow the energy hierarchy." (6.25)

5. NABERS UK Design for Performance

NABERS UK Design for Performance (DfP) is an industry initiative that aims to improve the energy performance of the office sector in the UK by setting energy targets, in energy consumed per square meter (kWh/m^2/year), measured during actual operation. Advanced energy modelling (beyond standard Part L compliance tools) is utilised during design to better understand anticipated building performance, and the final detailed model is then used to enhance commissioning and building optimisation.

This approach follows a similar method to the National Australian Building Environment Rating System (NABERS). The scheme was formally launched as "NABERS UK" on 26th October 2020.

Energy analysis in the UK is most commonly undertaken using Part L2A compliance methodology for Building Regulations purposes. This approach uses the National Calculation Methodology (NCM), which uses pre-determined building operation data such as levels of occupancy, usage patterns, ICT equipment (small power), lighting levels and ventilation rates, essentially standardising all operational factors and establishing a level playing field for compliance purposes.

Unlike Building Regulations Part L2 compliance calculations, the DfP approach sets out to represent the actual systems and building operation as accurately as possible / practical. The approach utilises actual design information and includes 'unregulated' energy consumption associated with small power, computers and servers, external lighting and other miscellaneous energy consumers such as lifts.

Benefits of NABERS UK include:

- Simple robust metric for real-world energy performance
- Provides all stakeholders assurance that design intent will be delivered
- More transparent performance & carbon data for investors, developers and occupiers
- Capital and operational cost savings (and potential spatial savings) due to refined plant selections based on advanced simulation
- Positive link to asset value in long term

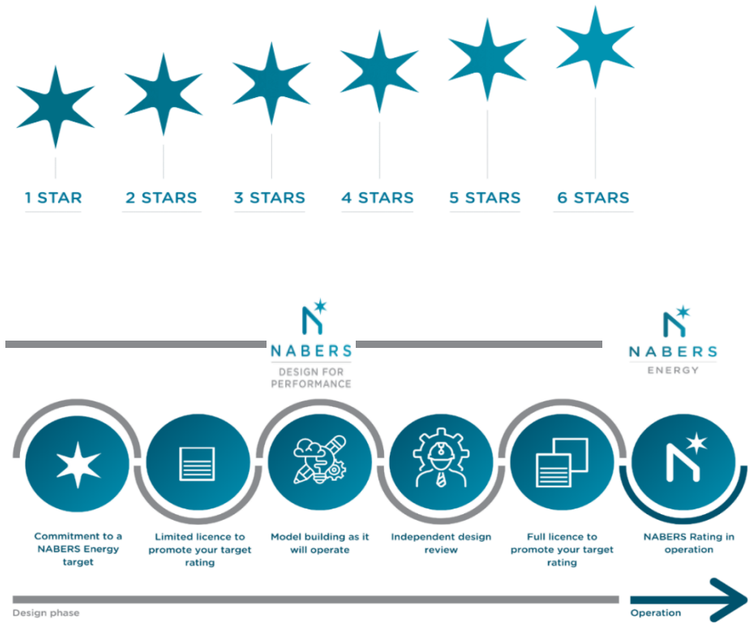


Figure 6 NABERS ratings and process

The Proposed Development is targeting a 5-star NABERS UK Design for Performance rating.

The project is targeting the following UKGBC NZC energy performance for offices targets:

- Whole Building 2020-2025 target: <130kWh/m^2 (GIA)/yr)
- Landlord 2025-2030 target: <55kWh/m^2 (GIA)/yr)

6. Cooling and overheating.

In tandem with the energy and CO_2 emissions appraisal, an assessment has been undertaken to determine the risk of summertime overheating, and subsequently consider measures for the minimisation of cooling demand and mitigating risk of overheating.

6.1 Cooling hierarchy.

The London Plan Policy (Overheating and Cooling) requests that developments should reduce potential overheating risk and reliance on air conditioning systems. A 'cooling hierarchy' is provided and the Proposed Development has sought to follow this hierarchy.

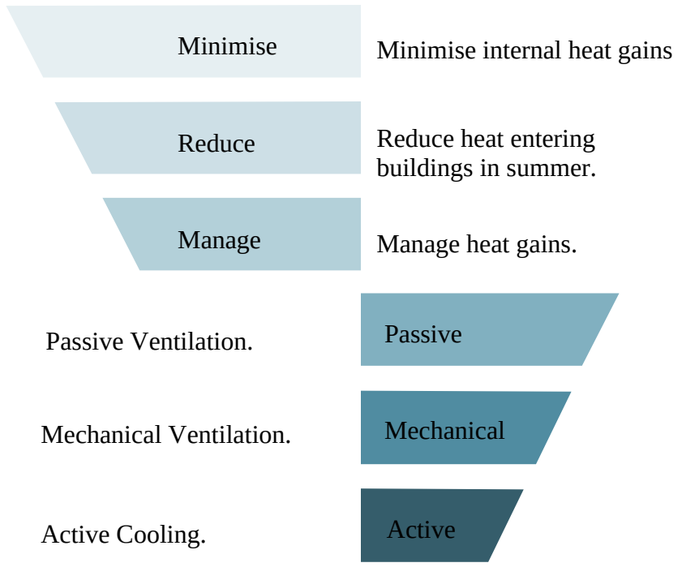


Figure 7: Cooling hierarchy.

6.2 Cooling demand reduction.

The table below compares the cooling energy demand of the actual building against a notional building built to Part L2 parameters.

Table 9: Cooling Demand Reduction.

Space Use	Notional building	Actual building	Notional > Actual
Cooling demand (MJ/m^2)	72.06	71.33	Yes

6.3 Mitigation strategy.

Minimising internal heat gains
The following mitigation methods will be implemented to minimise the internal heat generation through energy efficient design at the Proposed development:

- Energy efficient lighting (i.e. LED) with low heat output.
- Insulation to heating and hot water pipework and minimisation of dead-legs to avoid standing heat loss.
- Energy efficient equipment with low heat output to reduce unnecessary heat gain.

Reducing the amount of heat entering the building in summer
The following mitigation methods will be implemented to reduce the amount of heat entering the building in summer within the proposed development:

- Facades have been developed with suitable glazing-to-solid ratios, with particular focus on south facing orientations.
- Suitable g-values will be specified to further control solar heat gains as required; and
- Buildings will have the capability for internal blinds to be installed to improve occupant comfort.

Manage heat gains
- Opportunities to expose thermal mass to help to further regulate internal temperatures will be explored where possible. Openable vents within the facade paired with exposed concrete slabs can assist with regulating internal temperature through implementing a night-time purging regime.

Mechanical ventilation
Mechanical ventilation is an important element of building services, to maintain good indoor air quality throughout the day by providing fresh air and extracting vitiated air. Providing fresh air minimises the risk of stale and stagnant air and limits the risk of condensation and mould growth as well as benefitting the occupants' physical and mental wellbeing. Heat recovery mechanisms will be provided to save heating energy.

Mechanical ventilation plant will be located away from pollution sources, typically at roof level. It is anticipated that the design flow rates specified will aid the regulation of internal temperatures in summer months.

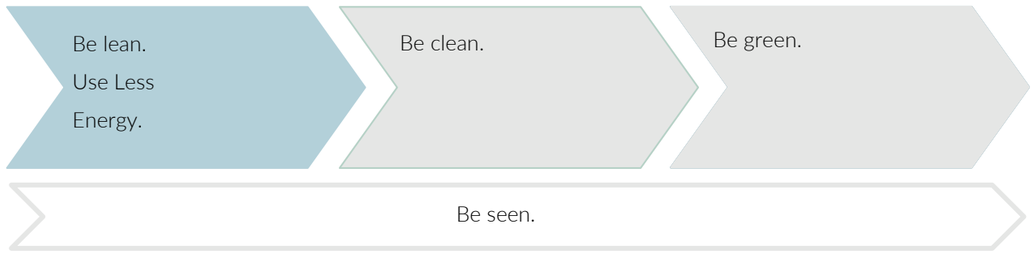
Active cooling
As the final step active cooling is specified, in order to keep internal temperatures within acceptable limits. The façade and building services have been designed with a 4-pipe fan coil unit cooling solution.

Overheating risk assessment

The cooling hierarchy principles have been followed as a means of reducing the amount of solar and internal gains, reducing the risk of overheating, and subsequently reducing the demand placed upon active systems.

7. Be lean.

Passive design and energy efficiency measures form the basis for the reduction in overall energy demand and carbon emissions for the proposed development. This energy strategy aims reduce the energy demand initially by optimising the envelope and building services within the proposed development.



7.1 . Passive design and energy efficiency features.

Passive design measures are those which reduce the demand for energy within buildings, without consuming energy in the process.

These are the most robust and effective measures for reducing CO_2 emissions as the performance of the solutions, such as wall insulation, is unlikely to deteriorate significantly with time, or be subject to change by future property owners. In this sense, it is possible to have confidence that the benefits these measures will continue at a similar level for the duration of their installation.

Table 10: Proposed fabric performance

Building element	Refurbishment Target Performance
Air permeability ($m^3/h.m^2$ at (50Pa))	3.0
External wall U-value/Staircore ($W/m^2.K$)	0.18/0.26
Windows ($W/m^2.K$)	1.5
Roof U-value (W/m^2K)	0.10
Spandrel Panel U-value (W/m^2K)	0.30
Exposed floor U-value (W/m^2K)	0.10
Glazing performance	
Vision Glazing g-value (Light Transmittance)	0.40 (≥0.7)

Table 11: Proposed system parameters

System parameters	
Heating, & Cooling	4-pipe ASHP and FCUs Heat recovery efficiency: 85% System specific fan power: 1.6 W/(l/s)
Ventilation	AHU
Lighting	All low energy LED lighting Office Installed Power Density: 1.5 W/m^2/100lux All other spaces lighting efficacy (including reception display lighting) 120 lm/W Lighting Controls: - Reception: no control - Basement Plant & Retail: man-on-off - All other areas: auto on-off with daylight dimming in perimeter areas.

Be lean summary.

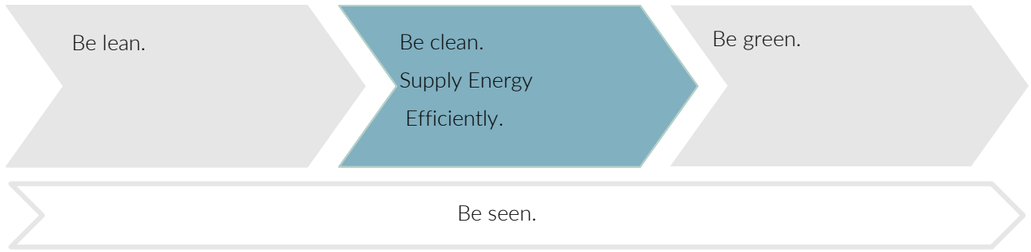
Sitewide
Target: Improvement against a GLA Refurbishment Baseline, based on Energy Assessment Guidance Appendix 3, at each stage of the energy hierarchy. No specific numerical target for Minor Developments

– 30.5% reduction over baseline
Appendix A details the target fabric and system performance parameters

–

8. Be clean.

This stage of the energy hierarchy includes consideration of connection to available district heat networks, or the use of on-site heat networks and decentralised energy production such as Combined Heat and Power (CHP) in order to provide energy and reducing consumption from the national grid and gas networks, through the generation of electricity, heating and cooling on-site.



8.1 Be clean: network and technologies.

The following sections detail considerations of the infrastructure and low-carbon energy supply measures that have been considered.

Combined heat and power (CHP)

Changes to the carbon factor of grid electricity have meant that previously favoured systems such as Combined Heat and Power (CHP) are becoming much less carbon efficient. In fact, CHP systems are now expected to lead to greater carbon emissions than conventional gas-fired boilers due to their lower efficiency.

Due to the decarbonisation of the electricity grid, alongside air quality concerns, CHP is not proposed.

Decentralised heat networks

Heat Network Priority Area (HNPA)

The majority of central London is identified as a Heat Network Priority Area, i.e., areas where heat density is sufficient for heat networks to provide a competitive solution for supplying heat to buildings and consumers.

The proposed development is located within an area of relatively low heat density[1]

Existing heat networks

The London Heat Map highlights the existing Rockefeller Energy Centre and Charterhouse Street Energy Centre, 1,932m and 1,448m, respectively from the site It is understood that these potential networks are not at close proximity to the site and do not therefore represent a viable connection opportunity at this stage for the project.

[1] London Heat Map (London Heat Map)

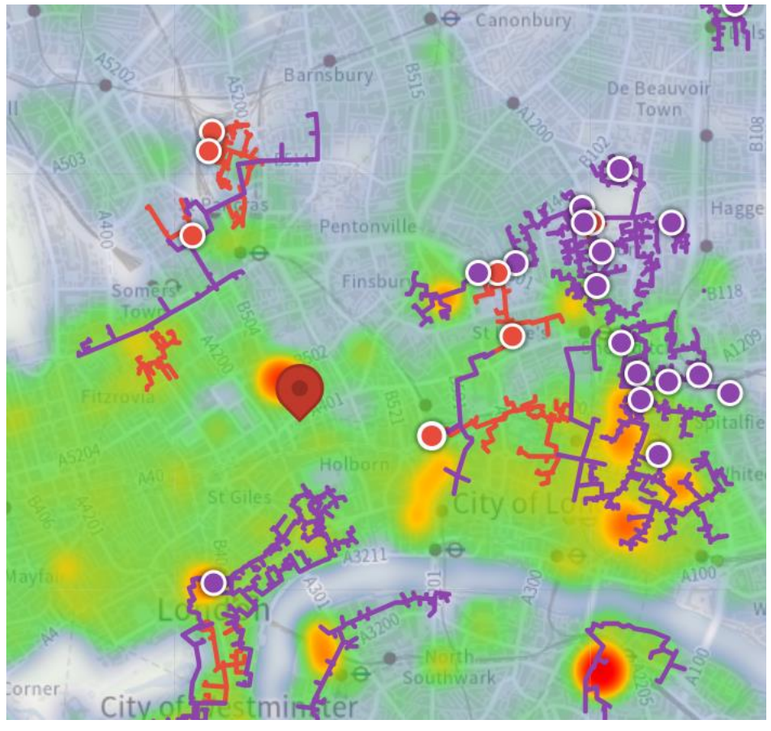


Figure 8: Extract from the London Heat Map showing the site with the existing networks

Decentralised heat networks summary

Table 12: Heat network summary

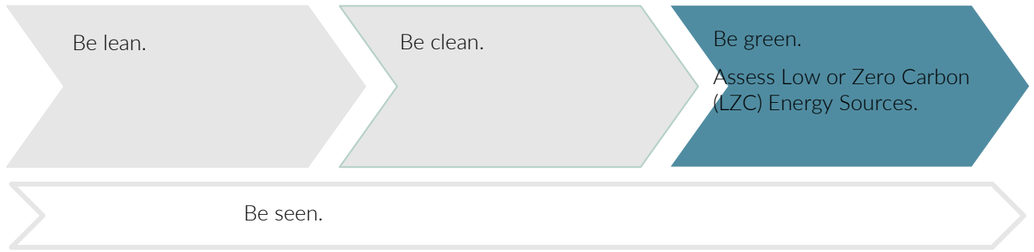
Development in a Heat Network Priority Area (HNPA)	Yes, low
District Heating Network connection	Not available
Development future proofed for DHN connection	Yes

Be clean summary.

Sitewide No requirement for Minor Developments	– No further reduction over baseline – There are no existing or planned district energy networks within feasible vicinity of the site that would enable a connection to the Proposed Development, nor are there currently any feasible future connections planned

9. Be green.

The final step of the energy hierarchy explores the feasibility of Low and Zero Carbon (LZC) technologies to allow for the production of renewable energy onsite in order to deliver further reduction in carbon emissions.



9.1 Low and zero carbon (LZC) technology assessment.

Renewable or zero carbon technologies harness energy from the environment and convert this to a useful form. Many renewable technologies are available, however, not all of these are commercially viable or suitable for city centre locations.

Discounted Technologies

Ground source heat pumps
Ground Source systems would require extensive below ground works to bury and install the system on site. Given the existing building present at the site, which will be retained, Ground Source Heat Pumps are not considered a feasible option, and are not proposed

Solar thermal
Available roof area is to prioritise solar PVs, since the electrical output from PV panels will be more suitable for implementation with the heat-pump led energy strategy and building energy usage.

Proposed Technologies

Photovoltaics
Solar irradiance analysis on the site has shown a good opportunity for the deployment of solar Photovoltaic technologies for onsite electricity generation.

Table 13: Solar PV specification

	Rooftop PV system
Panel Area	56 m^2 (circa 31 panels)
Orientation	140° (Southwest)
Inclination	30°
Module Efficiency	22.0%
Array size	12.3 kWp
Predicted Annual output	10.4 MWh
Layout drawing	See Appendix D

Air source heat pumps
ASHP plant can be located at roof level and integrated into space heating and hot water systems (albeit with some degree of ancillary top-up heating to raise water temperatures). Implementing heat-pump technology brings the additional benefit of a shift towards combustion-free development, with the associated benefit to local air quality.

Table 14: Target air source heat pump specification – Office

	Air source heat pump
Capacity	Heating: 2x 569 kW Cooling 2x 728 kW
Target SCOP	3.35*
SEER	4.61*
Heating Flow / Return Temperature °C	50/43 (LTHW)
Cooling Flow / Return Temperature °C	7/13
Manufacture's Specification & Efficiencies	See Appendix C

*Note that ASHP selection is not yet confirmed in the design. As such typical values have been selected based on the performance of four potential units from the same manufacturer. See Appendix C for more information.

Table 15: Variable Refrigerant Flow specification – Retail

	Variable Refrigerant Flow
SCOP	3.0
SEER	5.0

Table 16: Heat fraction

	% Heat fraction (space heating and DHW)
ASHP	100%
Direct electric / POU water heaters	0%
District heat network	0%
Gas boiler	0%
Other	0%

Full simulation inputs depicting the Proposed Development at the Be Green stage are provided in Appendix A.

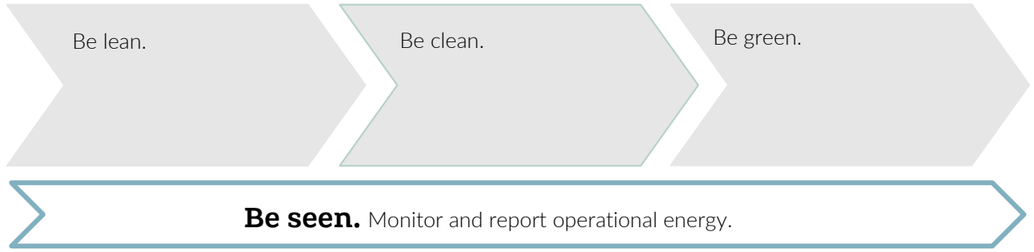
Be green summary.

Sitewide Improvement against the GLA
– 43% reduction over baseline
– Air source heat pumps will provide space heating, cooling, and hot water for

Refurbishment Baseline. No specific numerical target for minor developments

the office areas.
– 56m^2 solar photovoltaic array proposed at roof level.

10. Be seen.



10.1 Monitoring and Reporting.

Effective energy metering will be enabled by the provision of suitable infrastructure within the building's services systems.

Sustainability Monitoring and Reporting

The Applicant is committed to reporting sustainability performance, methodology and data every year in a transparent way, following the GRI guidelines. An annual Sustainability Report is published which contains agglomerated data concerning the Energy, Water, Waste and Greenhouse Gases reports of their portfolio.

Development Monitoring and Reporting Plan

The Proposed Development would therefore fall under the Applicant's corporate sustainability monitoring and reporting regime. The developed strategy will allow for an exhaustive metering of all the various energy usage in the facility. This will enable Energy Intensity and Carbon Emissions to be monitored, and the data included within the Annual Sustainability Reports.

Electrical meters will be provided on the main central Air Source Heat Pump(s), providing data on plant energy consumption throughout the year.

Each area of high energy load will be sub-metered in order to monitor energy consumption in greater granularity and facilitate reporting. All the main sub-systems (i.e. small power, lighting etc) will be separately monitored and their energy usage separately accounted. Energy intensity and carbon emissions will be monitored and reported annually.

The Applicant has also completed the planning stage of the GLA's Be Seen spreadsheet and at future stages will update the spreadsheet and follow the GLA's suggested Be Seen energy reporting protocols via the appropriate webs portals once these are available, at the appropriate stage.

10.2 Operational cost.

Operational costs for end users are an important consideration when appraising Energy Strategy options. Focussing solely on carbon emissions can lead to unintended consequences in the form of higher-than-expected occupant energy bills if capital and operational expenditure of the energy systems and networks are passed on to end users.

The Proposed Development is anticipated to achieve up to 30.5% across the Site beyond the baseline prior to the consideration of any Low or Zero Carbon (LZC) technologies, i.e. via passive design and energy efficiency measures. The savings achieved through the Be Lean stage demonstrate an energy demand reduction that will result in savings for future occupants.

The savings achieved through the be lean stage demonstrate an energy demand reduction that will result in savings for future occupants.

Additionally, the following measures have been implemented or followed to protect occupants from rising energy costs:

- Followed quality standards to ensure optimum design such as CIBSE Code of Practice
- Commercial areas of the scheme will target BREEAM Man 05 Aftercare credit to ensure all systems are correctly commissioned and training undertaken for occupant.
- Inclusion of solar PV to reduce dependence in grid electricity.

The be seen spreadsheet will be updated at each stage of the design, construction and operation in line with GLA guidance.

Unregulated Energy

Unregulated energy includes small power electricity use (computers, plug in devices, washing machines, refrigeration) and catering energy consumption.

It is anticipated that the proportion of unregulated energy would gain in significance when compared to regulated energy as each revision of Building Regulations Part L comes into force and regulated energy is reduced.

It is therefore foreseeable that energy efficiency and the rising cost of energy would play an increasing role when future building users are deciding which appliances to purchase and the frequency of their use. However, it is not possible at present to quantify the extent of this potential reduction.

Given the uncertainty, measures to educate the future building users on how they can reduce their equipment energy use would be encouraged. This can be provided in the form of building user guides fit-out guides. The guidance measures detailed within these types of documents would consider:

– Use of A / A+ rated white goods
– Energy star rated computers and flat screen monitors, and voltage optimization and power factor correction.
–
–

Figure 9 Regulated Energy and Unregulated Emissions Summary.

10.3 Operational Energy

To assess the operational energy of the proposed development a benchmarking exercise has been carried out based on the methodology suggested in CIBSE TM54.

TM54 modelling uses the same inputs as present in the Part L modelling but also includes more accurate operational room data and occupancy profiles which allows more accurate predictions of a building's operational energy.

For the purposes of this Energy Strategy, a benchmarking exercise has been carried out to estimate the operational energy performance range of the proposed development. As the design progresses and more information is available in later stages, a CIBSE TM54 assessment will be completed.

10.3.1 Baseline Operational Energy

Figure 10 and

Table 17 present the results of the initial benchmarking exercise. The development has been compared against schemes with similar fabric, services and space uses to determine likely operational energy performance. TM54 assessment and this benchmarking exercise account for energy consumption of the whole building, including both landlord and tenant usage.

The full TM54 to be carried out at later stages when more detailed information will be made available. This will be refined throughout subsequent design stages.

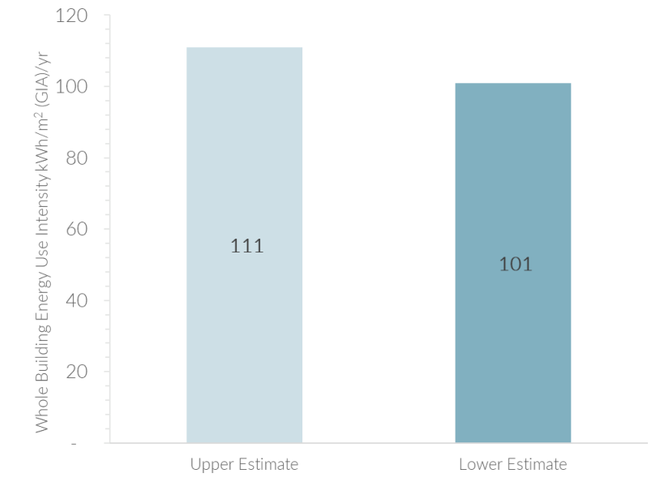


Figure 10 Benchmark TM54 Performance

Table 17: CIBSE TM54 performance

	Upper Benchmarking Estimate	Lower Benchmarking Estimate
	kWh/m^2(GIA)	kWh/m^2(GIA)
Total	111	101

10.4 Office Energy Use Intensity (EUI) and Heating Demand

Table 18 Office Energy Use Intensity and Heating Demand

Building type	Energy Use Intensity | EUI kWh/m^2$_{GIA}$/yr Excluding renewables	Space heating demand kWh/m^2$_{GIA}$/yr Excluding renewables	Methodology
Office	Landlord Upper Estimate: 41 Landlord Lower Estimate: 31 Tenant Allowance: 70 Whole Building Estimate: 101-111	Estimate: 11	TM 54 Benchmarking
Notes	Throughout Stages 3 and 4 the development will continue to look to implement energy saving measures to reduce the energy use intensity. In our experience the GLA targets of 55 kWh/m^2/year are extremely ambitious, and we are not aware of projects currently able to meet this target.		

10.5 Landlord Operational Energy Estimate

An example breakdown of Landlord Energy for the proposed space uses, orientation, fabric performance and services performance to the proposed development is shown in Figure 11. The largest contributors to the overall performance are the space heating and cooling. This demonstrates the importance of a high efficiency energy strategy.

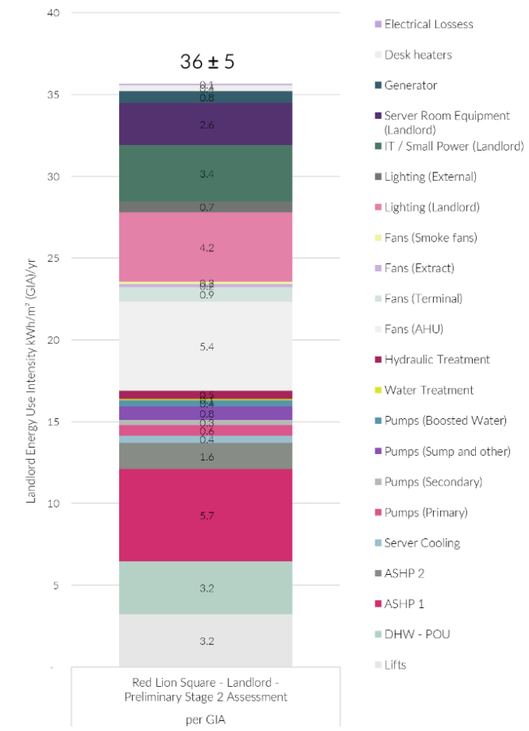


Figure 11 Estimated EUI Breakdown for Landlord Areas

Be seen summary.

Target: disclosure of the development's energy use	– GLA's be seen webform will be submitted as part of this planning application. – An updated "as built" be seen webform is to be submitted during RIBA Stage 6. – The development will include the necessary metering, energy monitoring and data processes to facilitate the annual reporting requirements. – – A benchmarking TM54 assessment has also been carried out to estimate the baseline operational energy of the proposed development. A more detailed TM54 assessment will be carried out as the design progresses in order to identify potential opportunities for improvement. –

11. Summary.

This strategy has shown that the Proposed Development will result in a highly efficient, low-carbon scheme.

New, high efficiency servicing equipment and efficient façades will minimise the energy usage of the building. Using the Mayor's energy hierarchy, the strategy has been developed to ensure that the Proposed development is efficient and economical.

This strategy has been prepared to demonstrate that at the planning stage, the Applicant and design team have given due consideration to the principles of energy and sustainability, and how these could be implemented for the Proposed Development.

The carbon emissions from regulated energy uses at the proposed development have been compared with the GLA London Plan emissions targets.

11.1 The energy strategy.

The strategy has been developed using the 'be lean, clean and green' energy hierarchy which utilises a fabric first approach to maximise reduction in energy through passive design measures.

Be lean.

Sitewide Improvement against the GLA Refurbishment Baseline, based on Energy Assessment Guidance Appendix 3, at each stage of the energy hierarchy. No specific numerical target for Minor Developments	– 30.5% reduction over baseline – Appendix A details the target fabric and system performance parameters

Be clean.

Sitewide No requirement for Minor Developments	– No further reduction over baseline – There are no existing or planned district energy networks within feasible vicinity of the site that would enable a connection to the Proposed Development, nor are there currently any feasible future connections planned –

Be green.

Sitewide Improvement against the GLA Refurbishment Baseline. No specific numerical target for minor developments	– 43% reduction over baseline – Air source heat pumps will provide space heating, cooling, and hot water for the office areas. – 56m^2 solar photovoltaic array proposed at roof level.

Be seen.

Target: disclosure of the development's energy use	– GLA's be seen webform submitted as part of this planning application. – An updated "as built" be seen webform is to be submitted during RIBA Stage 6. – The development will include the necessary metering, energy monitoring and data processes to facilitate the annual reporting requirements

11.2 Overall carbon dioxide emissions reduction

Sitewide

Table 19 Energy Strategy Summary Table

	Site-Wide Regulated Carbon Dioxide Emission Savings (tonnes CO_2/yr.)	
	Regulated	Unregulated
Baseline: GLA Baseline for Refurbishments (Appendix 3 of Energy Assessment Guidance)	82	75.3
After energy demand reduction (Be Lean)	57	75.3
After heat network / CHP (Be Clean)	57	75.3
After renewable energy (Be Green)	47	75.3
	Site-Wide Regulated domestic carbon dioxide savings	
	(tonnes CO_2/yr.)	(%)
Savings from energy demand reduction	25	30.5%
Savings from heat network / CHP	0	0.0%
Savings from renewable energy	10	12.5%
Cumulative on-site savings	35	43%

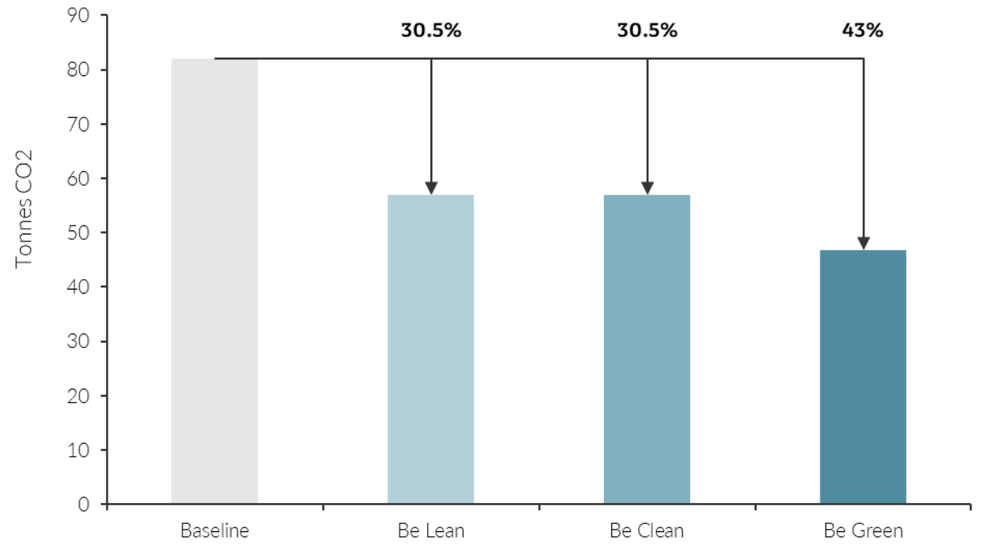


Figure 12: Sitewide carbon reduction summary

11.3 Flexibility and peak energy demand.

Flexibility	Included Y/N	Details
Renewable energy generation (load matching)	Y	As shown on architect's mark ups, PVs will be provided and integrated with the power provision for the building.
Gateway to enable automated demand response	Y	Gateway to the Building Management System (BMS) will be included within specification. relay the activation of certain equipment to assist grid demand when appropriate for building operation.
Smart systems integration (e.g. smart charge points for EV, gateway etc.)	Y	There is no car park on the site, however, any other battery charging functions will be designed and selected with smart charge principles in mind.
Other initiative	-	-

Appendix A: Proposed Building Modelling inputs.

Fabric

Building element	Refurbishment Target Performance
Air permeability ($m^3/h.m^2$ at (50Pa))	3.0
External wall U-value/Staircore ($W/m^2.K$)	0.18/0.26
Windows ($W/m^2.K$)	1.5
Roof U-value (W/m^2K)	0.10
Spandrel Panel U-value (W/m^2K)	0.30
Exposed floor U-value (W/m^2K)	0.10
Glazing performance	
Vision Glazing g-value (Light Transmittance)	0.40 (≥0.7)

DHW

	Detail	Units	DHW System 1	DHW System 2
Domestic Hot Water	System Name/Description	-	Basement showers	WC cores
	Heat Source	-	Heat pump (electric): air source	Direct or electrical storage heater
	Fuel Type	-	Electricity	Electricity
	Generator Seasonal Efficiency (COP)	%	4.00	1.00
	DHW Delivery Efficiency	%	0.85	0.95
	OR			
	DHW Secondary Circulation Losses	W/m		
	DHW Secondary Circulation Pump Power	kW		
	DHW Secondary Circulation Loop Length	m		
	DHW Storage Volume	litres	5,000	
	DHW Storage Losses	kWh/		
	OR	(l.day)		
	Insulation Type	-		
	Thickness	mm		
	Is there a time switch?	Y/N		

Systems & Lighting

Room Type	Heating	Cooling	Ventilation	Domestic Hot Water	Lighting	Lighting Controls
Core/Circulation	ASHP via radiators	None	AHU	Centralised	120 lm/W	AUTO-ON-OFF
			1.1733 l/s/m^2			
			SFP=1.6			
	Efficiency=3.35		HR=0.75			
Comms Room	None	DX Cooling	DX Cooling & Extract	Centralised	120lm/W	None
			1.1 l/s/m^2			
			SFP=0.5			
		Efficiency=7				
Open Plan Offices	4-Pipe ASHPs & FCUs	4-Pipe ASHPs & FCUs	AHU	PoU	1.5 W/m^2/100lux	AUTO-ON-OFF
		SEER=4.61	1.11 l/s/m^2			
	SCOP=3.095		SFP=1.6			
	Efficiency=3.35		HR=0.85	Efficiency=1		
Bin & Cycle Stores	None	None	AHU	Centralised	120lm/W	None
			(Extract)			
			0.25l/s/m^2			
			SFP=0.5			
Plant Rooms	None	None	AHU	Centralised	120lm/W	None
			Extract as part of smoke ventilation			
			1.1l/s/m^2			
			SFP=0.5			
Reception	4-Pipe ASHPs & FCUs	4-Pipe ASHPs & FCUs	AHU	PoU	120lm/W	AUTO-ON-DIMMED
		SEER=4.61	1.01 l/s/m^2			
	SCOP=3.095		SFP=1.6			
	Efficiency=3.35		HR=0.85	Efficiency=1		
Retail	VRF	VRF	AHU	PoU	120lm/W	AUTO-ON-OFF
		SEER=5	1.169l/s/m^2			
	SCOP=3.027		SFP=1.2			
	Efficiency=3		HR=0.85	Efficiency=1		
Changing/Showers	Central Heating via	None	AHU	ASHP & WWHP	120lm/W	AUTO-ON-OFF

Room Type	Heating	Cooling	Ventilation	Domestic Hot Water	Lighting	Lighting Controls
	ASHPs					
	radiators		1.11 l/s/m^2	(50-50 split)		
	SCOP=3.095		SFP=1.6			
	Efficiency=3.35		HR=0.85	Efficiency=1.91		
WC	Central Heating via ASHPs	None	AHU	PoU	120lm/W	AUTO-ON-OFF
	radiators		1.349 l/s/m^2			
	SCOP=3.095		SFP=1.6			
	Efficiency=3.35		HR=0.85	Efficiency=1		
Lift Lobby	None	None	AHU	PoU	120lm/W	AUTO-ON-OFF
			1.173l/s/m^2			
			SFP=1.6			
			HR=0.75	Efficiency=1		
Meeting Rooms	4-Pipe ASHPs & FCUs	4-Pipe ASHPs & FCUs	AHU	PoU	120lm/W	AUTO-ON-OFF
		SEER=4.61	1.11 l/s/m^2			
	SCOP=3.095		SFP=1.6			
	Efficiency=3.35		HR=0.85	Efficiency=1		

Appendix B: Heat pump system datasheets and efficiency calculation.

AERMEC

NPG3000E4°J°DHSH

Configuration

Model: NPG3000E4°J°DHSH

Code	NPG
Size	3000
Version	E - High efficiency with low noise
System type	4 - 4-pipe systems
Coils	° - Copper pipes and aluminium fins
Fans	J - Inverter
Power supply	° - 400V/3/50Hz with circuit breakers
User side pump	DH - Pump H + standby pump
DHW side pump	SH - Pump H + standby pump

Images are for reference purposes only and may not represent exactly the configured model in this document.

Show prices

Description	Quantity [n.]
NPG3000E4°J°DHSH	1

Certifications

Aermec participates in the Eurovent Certification Programme. The certified data of certified models are listed in the Eurovent Directory.

Notes

Data in accordance to EN 14511:2022

This unit is certified in the LCPHP Programme of Eurovent Certita Certification, with its component options allowed by the TCR document in force at all the conditions with a fouling factor of 0 m2K/kW (except ISEER) and with no antifreeze solution (except MT and LT Process Chiller applications, when certified).

Data shown is calculated without soft-starter and/or power factor correction devices.

The unit is suitable for the following energy applications:

- Low temperature comfort (12 / 7 °C)
- High temperature comfort (23 / 18 °C)
- Low temperature heating (35 °C)
- Medium temperature heating (55 °C)

The certified standard performances, conditions and the certification of the software can be verified in https://www.eurovent-certification.com
As specified in the conditions of use, the technical data shown are not binding; Aermec reserves the right to make changes for improvements or corrections at any time.

AERMEC

NPG3000E4*J*DHSH

Selection data		
Cooling		
Capacity	kW	813.8
Input power	kW	278.9
Input current	A	473.0
EER	W/W	2.92
Height above sea level	m	0
Dry bulb air inlet temperature	°C	35.0
Inlet water temperature	°C	12.0
Outlet water temperature	°C	6.0
Ethylene glycol	%	18
Water flow rate	l/s	34.4089
Available pressure	kPa	172
Fouling factor	(m² K)/W	0
Heating		
Capacity	kW	591.5
Input power	kW	252.0
Input current	A	442.8
COP	W/W	2.35
Dry bulb ambient air temperature	°C	-4.0
Wet bulb ambient air temperature	°C	-5.0
Inlet water temperature	°C	40.0
Outlet water temperature	°C	45.0
Ethylene glycol	%	18
Water flow rate	l/s	29.9014
Available pressure	kPa	231
Fouling factor	(m² K)/W	0
Simultaneous operation		
Cooling capacity	kW	794.2
Heating capacity	kW	1,035.1
Input power	kW	252.2
Input current	A	454.3
TER	W/W	7.25
		Cooling / **Heating**
Inlet water temperature	°C	11.6 / 36.7
Outlet water temperature	°C	6.0 / 45.0
Ethylene glycol	%	18 / 18
Water flow rate	l/s	34.4089 / 29.9253
Pressure drops	kPa	- / -
Available pressure	kPa	172 / 230
Fouling factor	(m² K)/W	0 / 0
Seasonal energy performance		

The certified standard performances, conditions and the certification of this software can be verified in https://www.eurovent-certification.com
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