Appendix 5: Sustainability Statement / Max Fordham LLP

University of London Town House Redevelopment

Sustainability Statement

P02

11th July 2024

MAX FORDHA

MAX FORDHAM

Max Fordham LLP
42/43 Gloucester Crescent
London
NW1 7PE

T 020 7267 5161

maxfordham.com

ISSUE HISTORY

Issue	Date	Description
P01	02/07/2024	Draft for Review and Comment
P02	11/07/2024	Comments addressed

MAX FORDHAM

CONTENTS

MAX FORDHAM

1.0 Executive Summary

This Sustainability Statement supports the planning application for the proposed refurbishment of the historic Georgian townhouses on Guilford Street and Lansdown Terrace.

This report addresses the following:
- Review of relevant planning policy
- Summary of key sustainability strategies

This statement should be reviewed alongside the other planning documents that have been submitted for this application.

The project is aiming to be an environmentally excellent example of the renovation of listed buildings. The table on the right shows the key measures that have been integrated into the design of the townhouses, ensuring the development meets the sustainability-related planning requirements.

	Key measures	Relevant Policy
Energy	• Fabric first approach, incorporating Passivhaus retrofit principals where possible, whilst maintaining historic building features. • Electrification of space heating and hot water demand • Sensitive integration of mechanical ventilation with heat recovery (MVHR) • Efficient MEP plant arrangements to align with Passivhaus design principals.	CC1 Policy 8.15
Material efficiency, embodied carbon, and waste	• Use of low-carbon materials where possible in the construction. • Carry out a pre-demolition audit to identify how the residual value of the building can be reused in the most valuable way	CC1 Policy 8.18 Policy 8.19
Water	• Installation of low-flow fittings on wash hand basins and WCs • Installation of rainwater harvesting and storage for use in the garden	CC3
Climate Change Adaptation	• The protection of an existing green space and creation of new green infrastructure, including living roofs. • Reducing surface water runoff through increasing permeable surfaces. • Overheating assessment and EnerPHit certification to make the buildings more suitable for future climate scenarios	CC2
Air Quality	• No fossil fuel combustion on-site • Use of MVHR in residences	CC4
Biodiversity	• Retention of the biodiversity of the existing gardens, preserving the assets of greatest value and creating new habitat spaces where feasible that are ecologically rich and diverse. Mansards incorporating living green roofs for further biodiversity enrichment at upper levels.	A3
Transport	• Provision of cycling spaces on site	T1 and T2

Table 1 - Key response to planning policy

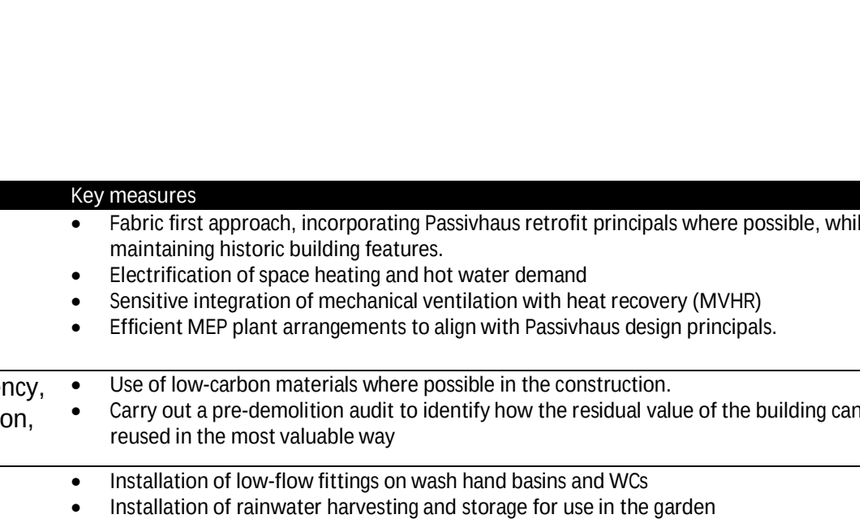


Figure 1 – Illustration of magnitude of impact a retrofit adopting Passivhaus principals can achieve in a domestic setting.

2.0 Project Introduction

General description
There are eight Grade II listed townhouses at nos. 89 - 92 Guilford Street and nos. 1 - 4 Lansdowne Terrace. They were originally constructed in 1799 but have all been adapted and some partially rebuilt since. They are owned by the University of London and have most recently been used as accommodation for students. They are all currently unoccupied as they are in poor condition.

Proposal
The project is;

- To refurbish and extend upwards a terrace of Grade II buildings from its current layout into student residences made up of 1-4 bed flats, with room proportions more similar to the original layout of the buildings. There will also be a larger multi bed student dwelling in the corner property as part of the development, retaining the larger single residence layout reminiscent of built intent originally.

The key aspects of this development are:

- Required structural improvements,
- Preservation of heritage assets,
- Installation of new internal and external insulation,
- A mansard extension across the site, and small extension at the back of the corner property.

Sustainability Aspirations
The overall sustainability aspirations for the project are:

- To greatly reduce the operational energy use of the residences,
- To deliver a low embodied carbon design, through efficient design and the use of low embodied carbon materials as well as retention of façade and structure where possible
- Biodiversity net gain through the enhancement of external space,
- Eliminating all fossil fuel combusting technology on-site
- Water (low flow fittings and harvesting water for garden irrigation purposes)
- Use of Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate
- Adaption to climate change,
- The provision of cycle storage to encourage active transportation.

Figure 2 - Existing buildings

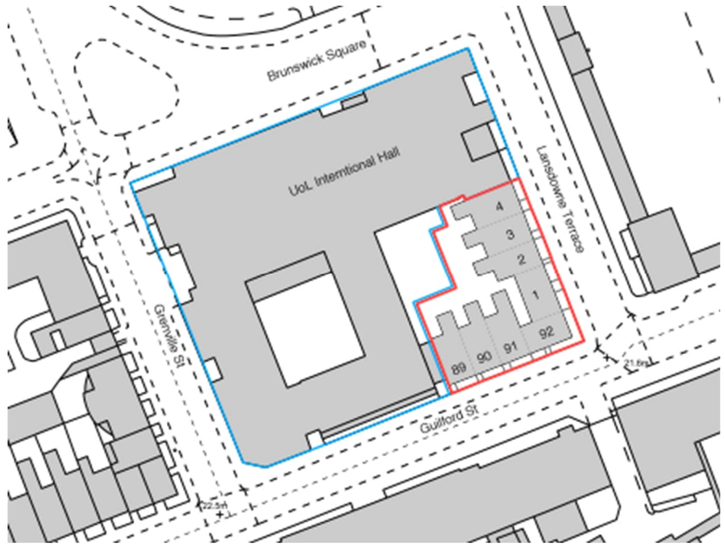


Figure 3 - Site location

MAX FORDHAM

MAX FORDHAM

3.0 Sustainability Statement

3.1 Energy Strategy

Overview of Proposed Strategy

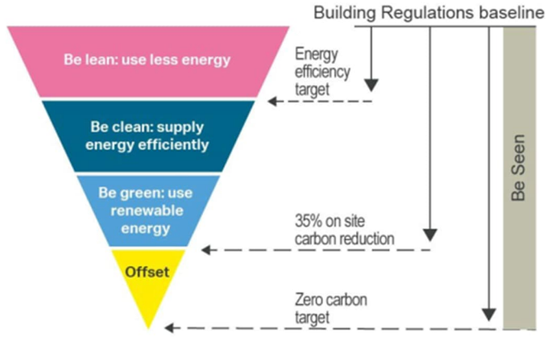
The energy strategy for the Guilford Street and Lansdown Terrace Georgian townhouses has been developed with careful coordination between the Heritage Consultant, Architect, and Structural Engineer to provide a well balanced response to the needs of these historic and un used buildings. The key features of the energy strategy are:

- A fabric first approach with Passivhaus Enerphit methodologies to be incorporated for the deep retrofit of the buildings.
- Sensitivity to traditional fabric materials has been well considered and breathability of building fabric is to be maintained, and in some areas improved on, through choice of materials and finishes in thermal upgrades.
- Locations of fabric works (e.g. front façade or back façade) and MEP installations (e.g. ventilation outlets to rear of properties) being balanced with heritage and architecture to provide cohesive and balanced whole building strategy.
- Efficient installations will include MVHR heat recovery, with product selection and installation location aligning with Passivhaus design guidance.
- Low temperature (around 50/30°C) communal heat distribution networks will be used to supply LTHW heat energy to flats to minimise losses. These will be fitted with high standards of insulation.
- It is planned that the development will use efficient electrical heat sources that will benefit from the progressive grid decarbonisation.
- Retention and reinstatement of Georgian features such as generous openable windows, high ceilings and wooden shutters where appropriate which will be utilised by the development to provide good daylighting, purge vent and further improve the building thermal performance.

The strategy also follows the GLA policy SI 2, minimising greenhouse gas emissions through the application of the energy hierarchy:

- Be lean: use less energy and manage demand during operation
- Be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
- Be green: maximise opportunities for renewable energy by producing, storing and using renewable energy onsite
- Be seen: monitor, verify and report on energy performance

Figure 9.2 - The energy hierarchy and associated targets



Source: Greater London Authority

Be Lean

In line with GLA policy the design emphasis is first and foremost on passive measures that can be used to reduce energy consumption. The development will include high performing insulation levels aligning with Passivhaus EnerPHit standards, which will be selected for the preservation of building fabric and heritage features. The front of the terraces will be insulated on the inside in order to retain their brick frontages and Georgian proportions. The rear of the building, which has already had numerous interventions and alterations, will be externally insulated with a breathable construction. It is proposed that the rear parts of the buildings work thermally harder than the front facades allowing retention of Georgian features and proportions street side without compromising overall building performance.

Glazing options have been appraised for the site in order to best achieve the target of a Passivhaus EnerPHit level of performance, whilst retaining the historic architecture and achieving required acoustic performance. The project is proposed to have new, high performing wood framed triple glazed units installed in a sensitive design, with particular traditional styling to the windows on the front façade.

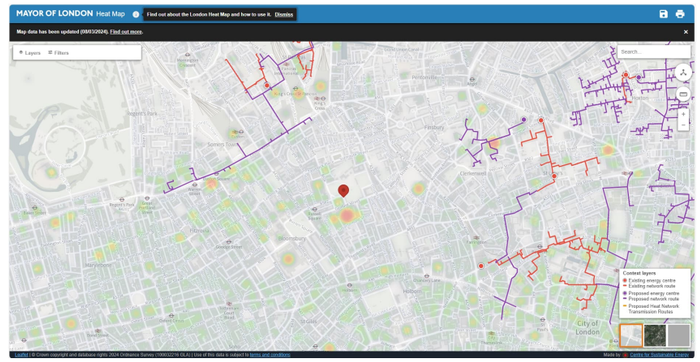
The fabric performance will be further enhanced by high airtightness and careful detailing around thermal bridges – with especial care being taken to maintain suitable breathability of the fabric and structure to preserve it.

The dwellings will be ventilated by high performing individual MVHR units with speed controls to minimise their energy consumption. Units will be located adjacent to external facades with insulated intake and exhaust ductwork. Internal ductwork will be routed to allow ceiling heights to be maximised in principal rooms to retain the heritage character.

Low temperature (around 50/30°C) communal heat distribution networks will be used to supply LTHW heat energy to flats to minimise losses. These will be fitted with high standards of insulation. As these are supplying LTHW only it is anticipated that they will be off over summertime therefore further saving energy in losses and pumping, and reducing over heating risks.

Be Clean

The London heat map has been reviewed for the latest district heat network information in the local area. As can be seen from the image the site (red pin) is not currently in proximity to any existing heat networks (red). Nor are any planned networks (purple) in a viable proximity to the site. Therefore, heat networks and sources out with the site have been discounted. It's proposed the site uses electrified heat sources, enabling the site for zero carbon heating and removing combustion load from this site. The heat sources (ASHP) are each typically serving 5 flats within a townhouse via a communal heat network of pipes distributing through a core within each building at low temperatures.



Be Green

Having maximised opportunities to passively reduce energy consumption and supply energy efficiently to reduce annual CO2 emissions, the refurbished townhouses will further reduce annual CO_2 emissions through the use of renewable ASHP technology installed on the rooftops of the townhouses. The ASHPs are to be located discretely positioned at chimney stacks in order to minimise visual impact. Due to the historic nature of the buildings, and the roof topography which is overlooked by neighbouring buildings, it is not proposed to incorporate solar roof technology (PV or solar thermal).

Be Seen

Post-construction the site will have extensive metering installed to allow on-going client monitoring and reporting of energy performance.

3.2 Material efficiency, embodied carbon and waste

Existing Houses

The project team's approach is centred on providing a range of measures to reduce carbon impact of new materials in the renovation of the existing houses including:

- Retention of the primary structure and foundations of the main house with minor alterations,
- New supporting structure required to be installed using traditional techniques
- Removed floorboards to be assessed and re-installed where they are of sound condition

- Retention and some replacement of original features such as shutters

Waste and circular economy
The development aims to lower the Whole Lifecycle Carbon impact of the development through a variety of strategies. The project team have evaluated the requirements for the depth of refurbishment, and items are only to be removed and replaced where it is deemed absolutely necessary for the performance of the building.

The reuse of existing services was considered, including a stepped refurbishment strategy where these would be replaced further down the line. It was decided that this would not allow the building to achieve as high thermal and energy performance if this route was followed and would tie the redevelopment to burning fossil fuels in the short term. The services design has considered the end of life strategy, so plant items are accessible and should be easy to replace if required.

The services and structure have been centralised in the design, so that the building is more readily adaptable in the future. New structural elements will be installed with bolted connections so can be easily taken apart at end-of-life.

Careful consideration will be given to how construction and demolition waste will be minimised and diverted from Landfill.

The project aims for 95% (either by volume or tonnage) of all demolition, construction, and excavation waste to be diverted from landfill to be reused and/or recycled.

Figure 4 - Waste hierarchy

Demolition:
- A pre-demolition audit has been carried out by a suitably qualified individual.
- The results of the audit will be used to inform the detailed plans for material reuse.
- It is unlikely that many materials will be able to be reused on site as many are not in good condition.
- Existing furniture and carpet will be removed by the University pre construction, and there is potential for these to be reused elsewhere on campus where they are in good condition

Construction:
- A site waste management plan will be implemented.
- The contractor will be required to carry out on-site waste segregation.

Responsible sourcing
The project aims to maximise the total material by value that is responsibly sourced against BES 6001 certification (or equivalent) and having all timber FSC certified and legally sourced. The development aims to use where practical predominantly traditional construction, such as timber frames, wood fibre and sheep wool insulation, and lime mortar.

The development will provide appropriately sized facilities for waste and recycling in operation.

Step	Description	Measures
1	Minimise internal heat generation through energy efficient design	Passivhaus EnerPHit design principals to be targeted.
2	Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls	Improved insulation across the building Low g-value glazing proposed Original shuttering retained/reintroduced in the scheme
3	Manage the heat within the building through exposed internal thermal mass and high ceilings	The buildings' heritage means that the existing walls have a high thermal mass. Ceiling height is to be maximised in habitable spaces.
4	Passive ventilation	Securable opening windows distributed through the habitable spaces of the architectural scheme. All units are dual aspect and so will benefit from cross ventilation. Priority has been given to bedrooms at rear elevations onto residential courtyard.
5	Mechanical ventilation	MVHR units provided
6	Active cooling systems	None currently

Table 2 - Measures taken within the cooling hierarchy to manage overheating risk

3.3 Climate Change Adaptation

The development is adopting appropriate climate change adaptation measures which include:

- the protection and improvement of an existing green space
- not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces

Avoiding Overheating
The cooling hierarchy has been followed to manage the risk of overheating within the building.

An approach considering Approved Documentation, CIBSE Technical Memorandum 59 for the assessment of overheating risk in homes (TM59) and the Good Homes Alliance Tools and Guidance have been used to establish what are likely to be the most effective measures for controlling overheating risk.

Sustainable Urban Drainage
A Flood Risk Assessment has been undertaken for the project. This concludes that the site is of low risk as it is located in Flood Zone 1. Suggestions have been made for the drainage strategies to be implemented.

A variety of sustainable drainage measures (SuDS) are to be implemented across the site. Gardens are to be retained and enhanced in the courtyard areas, and permeable paving is currently being considered. This would have to work around the servicing strategy, so the potential extent is yet to be confirmed.

3.4 Water Consumption

Water consumption will be reduced through the water saving hierarchy.

- Low flow fittings will be specified for the wash hand basin taps and WC flush
- The use of greywater recycling is not proposed due to the higher lifecycle carbon emissions associated with these systems in comparison to the local water network, and their unsuitability for maintenance in a domestic environment.

3.5 Air Quality

The development will not use any fossil fuel combusting technologies for heating, hot water, or cooking. This approach will have no adverse effect on local air quality (ref. Policy CC4).

The internal air quality will be managed through the requirements for fresh air in the EnerPHit design principals and avoiding use of products containing high VOC levels.

MAX FORDHAM

3.6 Biodiversity

Proposals aim to significantly enhance the biodiversity of the existing gardens, preserving the assets of greatest value (i.e., mature trees) and creating new habitat spaces that are ecologically rich and diverse including on the new mansard roofs. The existing biodiversity value is to be determined by an ecologist, and the proposals hope to achieve a 10% net gain on this value.

Among the proposed enhancements are:

- Living roofs
- Planters on the new terraces
- New planting beds and raingardens in the courtyard

The proposed landscape scheme creates a range of habitat spaces across the site, which will work together holistically to establish a rich garden ecology suitable for a broad range of fauna. Our proposals will aim to be low resource, using little irrigation, and require modest maintenance input.

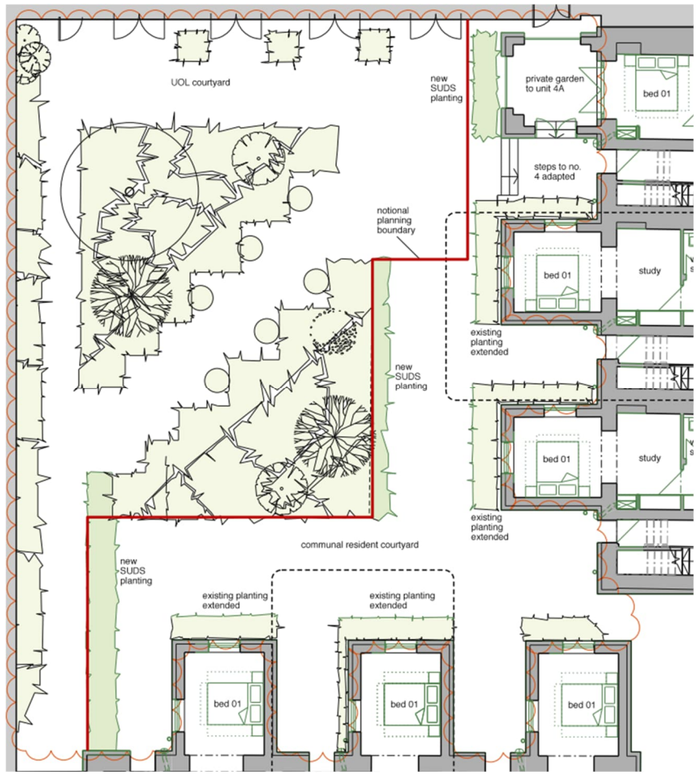


Figure 5 - Landscape proposal

3.7 Transport

The site is in an area with good public transport provision, being a 4 minute walk from Russell Square tube station and close to a number of bus stops. Cycle parking provision on site is constrained by the nature of the buildings and the listed status of some of them. Cycle parking is to be provided in the existing basement store areas and accessed through the lightwells. The current proposal is for 40 new cycle spaces within the stores, although the final number is subject to further structural investigation into the feasibility of widening the door openings.

With these spaces, on-site cycle parking is maximised as much as possible, and will be a significant improvement over the existing provision. This provision should meet the anticipated demand, and there is other existing cycle parking in the area which can be utilised if needed.

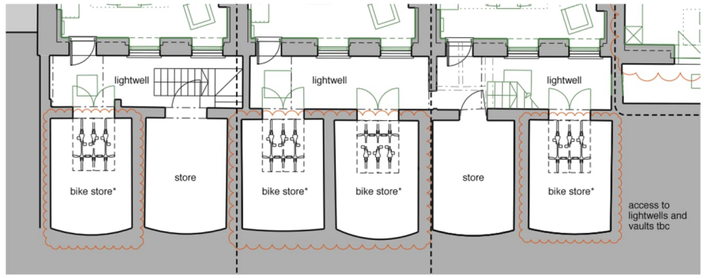


Figure 6 - Cycle parking

APPENDIX A - SUMMARY OF KEY SUSTAINABILITY POLICY

Introduction

The proposed development is submitted within the context of national, regional, and local planning policies that seek to address the challenges of climate change and sustainable development.

National Policy and Legislation

- Climate Change Act (2008): 80% reduction in greenhouse gas (GHG) emissions compared to 1990 levels by 2050.
- Current 2021 Part L of the Building Regulations for England & Wales: Sets out maximum levels of CO_2 emissions by comparing the actual buildings, to a notional building.
- Consideration of High-efficiency Alternative Systems: Building Standards requires the technical, environmental, and economic feasibility of high-efficiency alternative systems such as renewables, cogeneration, district heating and heat pumps to be considered.
- National Planning Policy Framework (2019): Mitigating and adapt to climate change, including taking account of flood risk, water supply and biodiversity.

Local Planning Policy

- London Plan (2021):
- London Borough of Camden:
    - Camden Local Plan (2017)
    - Camden Climate Action Plan 2020-25
    - Biodiversity CPG (2018)
    - Energy efficiency and adaptation CPG (2021)
- London Air Quality Management Areas

The London Plan 2021

The London Plan 'Spatial Development Strategy for Greater London', published in March 2021, forms the statutory development plan for Greater London.

Relevant policies in relation to sustainability are the following:

Policy GG6 'Increasing Efficiency and Resilience'
Help London become a more efficient and resilient city:

- Improve energy efficiency and support move toward a low carbon circular economy
- Building designed to adapt to a changing climate

Policy G1 'Green Infrastructure'
Development proposals should incorporate appropriate elements of green infrastructure.

Policy G4 'Open Space'
Development proposals should not result in a loss of protected open space.

Policy G5 'Urban Greening'
Proposals should contribute to the greening of London by including urban greening as a fundamental element of site and building design.

Boroughs should develop an Urban Greening Factor (UGF) to identify the appropriate amount of urban greening required in new developments.

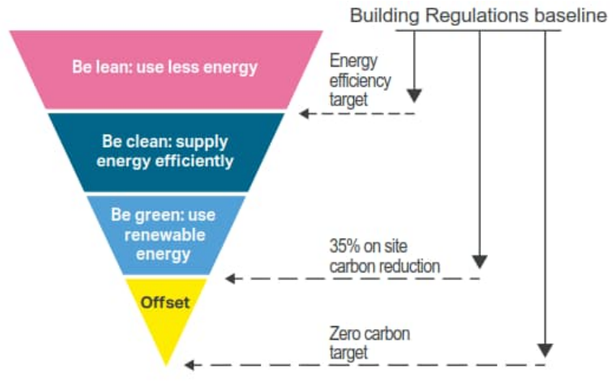
Policy G6 Biodiversity and access to nature
Development proposals should manage impacts on biodiversity and aim to secure net biodiversity gain.

Policy SI1 'Improving Air Quality'

- developments should be at least air quality neutral.
- All energy proposals should have emissions lower than those generated by ultra-low NOx emission gas boilers.
- For major developments preliminary Air Quality Assessments (AQAs) should be carried.

Policy SI2 'Minimising Greenhouse Gas Emissions'
The existing requirements have been strengthened, and some aspirations of the previous plan have been clarified:

The New Energy Hierarchy:



Be Lean: Use less energy and manage demand during operation

Be Clean: Exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly

Be Green: Maximise opportunities for renewable energy by producing, storing, and using renewable energy onsite

Be Seen: Monitor, verify and report on energy performance

Policy SI3 'Energy Infrastructure'
Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system.

The heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

a) connect to local existing or planned heat networks
b) use available 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).
d) Use ultra-low NOx gas boilers.

Policy SI4 'Managing Heat Risk'
Show steps to minimise overheating and avoid active cooling:

1) minimise internal heat generation
2) reduce the amount of heat entering a building
3) manage the heat within the building
4) provide passive ventilation
5) provide mechanical ventilation
6) Provide active cooling systems.

Policy SI5 'Water Infrastructure'
In order to minimise the use of mains water, water supplies and resources should be protected and conserved in a sustainable manner.

Encourage to incorporate measures such as smart metering, water saving and recycling measures, including retrofitting.

Policy SI7 'Reducing Waste and Supporting the Circular Economy'
Waste reduction, increases in material re-use and recycling and reductions in waste going for disposal will be achieved by:

1) Promoting a more circular economy that improves resources efficiency and innovation.
2) Encouraging waste minimisation and waste avoidance.
3) Ensuring that is zero biodegradable or recyclable waste to landfill by 2026.
4) Meeting or exceeding the recycling targets for each of the following waste streams and generating low-carbon energy in London from suitable remaining waste:
    a) Municipal waste – 65% by 2030.
    b) Construction, demolition, and excavation waste – 95% by 2020.
5) Designing developments with adequate and easily accessible storage space that supports the separate collection of dry recyclables and food.

Referable applications should promote circular economy outcomes and aim to be net zero-waste. A circular economy statement should be submitted.

Policy SI12 'Flood Risk Management'
Current and expected flood risk from all sources across London should be managed in a sustainable and cost-effective way.

Policy SI13 'Sustainable Drainage'
Development proposals should aim to achieve greenfield run-off rates and ensure that surface water run-off is managed as close to its source as possible in line with the drainage hierarchy:

Drainage should be designed and implemented in ways that address issues of water use efficiency, river water quality, biodiversity, amenity, and recreation.

Policy T2 'Healthy Streets'
Development proposal should:

1) Demonstrate how they will deliver improvements that support the ten healthy streets indicators in line with transport for London guidance.
2) Reduce dominance of vehicles on London's streets whether stationary or moving.
3) be permeable by foot and cycle and connect to local walking and cycling networks as well as public transport.

Policy T5 'Cycling'
(...) development proposals should help remove barriers to cycling and create a healthy environment in which people choose to cycle.

Camden Local Plan

Policy H3 Protecting existing homes
The Council will aim to ensure that existing housing continues to meet the needs of existing and future households by:

a. resisting development that would involve a net loss of residential floorspace.
b. protecting housing from permanent conversion to short-stay accommodation intended for occupation for periods of less than 90 days.

Policy H6 Housing choice and mix
Design of all housing to provide functional, adaptable, and accessible spaces;

Policy H7 Large and small homes
The Council will aim to secure a range of homes of different sizes that will contribute to creation of mixed, inclusive and sustainable communities and reduce mismatches between housing needs and existing supply.

C1 Health and Wellbeing
Development to positively contribute to creating high quality, active, safe, and accessible places. Proposals for major development schemes to include a Health Impact Assessment (HIA).

Policy C5 Safety and security
Require developments to demonstrate that they have incorporated design principles which contribute to community safety and security

Policy A3 Biodiversity
Realise benefits for biodiversity through the layout, design and materials used in the built structure and landscaping elements. Incorporate additional trees and vegetation wherever possible.

Policy A4 Noise and vibration
Where uses sensitive to noise and vibration are proposed close to an existing source of noise or when development is likely to generate noise is proposed, the Council will require an acoustic report.

Policy D2 Heritage
The Council will not permit the loss of or substantial harm to a designated heritage asset, including conservation areas and Listed Buildings.

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 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.

All developments involving five or more dwellings are encouraged to assess the embodied carbon emissions associated with the development.

Policy CC2 Adapting to climate change
All developments should adopt appropriate climate change adaptation measures, such as:

a. the protection of existing green spaces and promoting new appropriate green infrastructure;
b. not increasing, and wherever possible reducing, surface water runoff through increasing permeable surfaces and use of Sustainable Drainage Systems;
c. incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
d. measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy.

All new developments will be expected to submit a statement demonstrating how the London Plan's 'cooling hierarchy' has informed the building design.

Policy CC3 Water and flooding
We will require development to:
a. incorporate water efficiency measures.
b. avoid harm to the water environment and improve water quality.
c. consider the impact of development in areas at risk of flooding (including drainage);
d. incorporate flood resilient measures in areas prone to flooding.
e. utilise Sustainable Drainage Systems (SuDS) in line with the drainage hierarchy to achieve a greenfield run-off rate where feasible; and
f. 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.

Policy CC4 Air quality
Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan.

Policy CC5 Waste
Developments should include facilities for the storage and collection of waste and recycling.

The Council will encourage the submission of a site waste management plan prior to construction.

Policy T1 Prioritising walking, cycling and public transport
Provide for accessible, secure cycle parking facilities with provision for high quality facilities that promoting cycle usage.

Policy T2 Parking and car-free development
Limit on-site parking to spaces designated for disabled people where necessary and/or essential operational or servicing needs.

Energy efficiency and adaptation CPG (2021)

- Developments are to target a 20% reduction in carbon dioxide emissions from on-site renewable energy technologies
- Energy statements should demonstrate how a development has been designed following the steps in the energy hierarchy
- Deep refurbishments (i.e. refurbishments assessed under Building Regulations Part L1A/L2A) should also meet the London Plan carbon reduction targets for new buildings.
    - Zero carbon, minimum 35% reduction below Part L Building Regulations onsite, with 15% reduction through on-site energy efficiency measures) (London Plan Local Plan CC1)
- Condition and feasibility study, and options appraisal. (applies to major redevelopment applications, any development proposing substantial demolition)
- Resource efficiency plan. (All major applications, and new buildings)