

Frederick Morfill House Sustainability Statement

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Prepared by: Alice Thwaites-Rice
Reviewed by: Jess James

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1 Introduction

This sustainability statement has been prepared for the proposed development of Frederick Morfill House in order to meet the sustainability requirements of the London Plan and Part L. The proposed development consists of the erection of two three-bedroom homes. The site is shown in Figure 1-01.



Figure 1-01 – Frederick Morfill House

2 Policy

2.1 London Borough of Haringey's Local Plan

Policy SP4 Working towards a low carbon Haringey

Over the life time of the Local Plan, reducing energy use in buildings and working towards a low carbon borough will be one of the key challenges facing Haringey. The Council will promote the measures outlined below to reduce carbon emissions from new and existing buildings.

1. In line with London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction and occupation, by incorporating the following measures:
 - a. From 2011 onwards, all new residential development will achieve a minimum 25% reduction in total (regulated) CO₂ emissions in line with Code for Sustainable Homes Level 4 energy standards, and should aim to achieve Level 6. All new residential development shall be zero carbon from 2016 onwards; and

- b. From 2011 onwards all new non-residential development shall be built to at least BREEAM "very good" standard and should aim to achieve BREEAM "excellent" or the current nationally agreed standard. All new non-residential development shall be zero carbon from 2019.

2. The Council will promote low- and zero-carbon energy generation through the following measures:

- a. Requiring all developments to assess, identify and implement, where viable, site-wide and area-wide decentralised energy facilities including the potential to link into a wider network;
- b. Establishing local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible;
- c. Working with neighbouring boroughs and other partners to explore ways of implementing sub-regional decentralised energy networks including the potential in the Upper Lee Valley Opportunity Area; and

- d. All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from onsite renewable energy regeneration, which can include connections to local sources of decentralised renewable energy.

2.2 London Borough of Haringey's Energy and Carbon ER's

Part A

Net Zero Carbon Homes in Operation

Net Zero carbon buildings are supported by four core principles: energy efficiency, low carbon heat. Renewable energy, and low embodied carbon.

Energy Efficiency

Buildings use energy for heating, hot water, ventilation, lighting, cooking and appliances. The efficient use of energy reduces running costs and carbon emissions. It also reduces a building's impact on the wider energy supply network, which is an important consideration.

Low Carbon Heating

Low carbon sources of heat are an essential feature of Net Zero carbon buildings. All new buildings should be built with a low carbon heating system and must not connect to the gas network.

Renewable Energy Generation

In new buildings, renewable energy generation should ideally be at least equal the energy use of the building on an annual basis for it to qualify as Net Zero carbon in operation on-site. This should be achieved through the use of solar photovoltaic (PV) panels. If it is not technically feasible (e.g. high density development), the shortfall in renewable energy generation should be identified and addressed by Homes for Haringey, ideally on another site with more roof space available (e.g. lower density development).

Low Embodied Carbon

Net Zero carbon buildings should minimise embodied carbon in materials and product selection. This should be as well as reducing operational carbon. Comparisons between the two are rarely valid or fair comparisons on a building by building basis.

7 – The role of Passivhaus

Passivhaus is the world's leading comfort and energy standard for buildings. It sets targets for space heating demand and total energy that a building can use and provides a process to ensure that target is achieved.

Passivhaus is simple. It focuses on these core principles:

- Reducing heating energy.
- Best practice construction fabric performance.
- Robust energy calculations using PHPP (Passivhaus Planning Package).
- Quality assurance during design and construction.

The London Borough of Haringey require all buildings to be designed to the Passivhaus 'Classic' standard. The London Borough of Haringey will decide at the end of RIBA Stage 4 whether to proceed to formal certification on a project-by-project basis.

Should technical feasibility or financial viability prevent Passivhaus 'Classic' being achieved, design teams will need to demonstrate why and, subject to the London Borough of Haringey's approval, seek agreement on a relaxed set of KPIs, using the same methodology. The quality assurance process in this situation will be the self-certified AECB Standard which uses a similar methodology to Passivhaus.

8 – The AECB Standard

The AECB Standard is a process for self-certification of PHPP calculations and construction quality. The energy consultant would prepare a PHPP calculation and supporting design and construction evidence, then upload to the AECB Low Energy Building database. They take responsibility for certification and for underwriting the standard claim. The AECB self-certification process is designed to make explicit the project's claim to be a low energy design and to provide the consumer with a degree of protection under trading standards. <https://aecb.net/aecb-building-certification/>

2.3 The London Plan

Policy SI 1: Improving Air Quality

- A. Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.
- B. To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:
 1. Development proposals should not:
 - a) lead to further deterioration of existing poor air quality
 - b) create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits
 - c) create unacceptable risk of high levels of exposure to poor air quality.
 2. In order to meet the requirements in Part 1, as a minimum:
 - a) Development proposals must be at least Air Quality Neutral
 - b) Development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures
 - c) Major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1
 - d) Development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure.
- C. Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:
 - a) how proposals have considered ways to maximise benefits to local air quality, and
 - b) what measures or design features will be put in place to reduce exposure to pollution and how they will achieve this.
- D. In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road

Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance.

- E. Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.

Policy SI 2 Minimising greenhouse gas emissions

- A. Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:
 1. be lean: use less energy and manage demand during operation
 2. be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
 3. be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
 4. be seen: monitor, verify and report on energy performance.
- B. Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.
- C. A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:
 - a. through a cash in lieu contribution to the borough's carbon offset fund, or
 - b. off-site provided that an alternative proposal is identified, and delivery is certain.
- D. Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.
- E. Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.
- F. 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 Energy infrastructure

- A. Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.
- B. Energy masterplans should be developed for large-scale development locations (such as those outlined in Part A and other opportunities) which establish the most effective energy supply options. Energy masterplans should identify:
 1. major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
 2. heat loads from existing buildings that can be connected to future phases of a heat network
 3. major heat supply plant including opportunities to utilise heat from energy from waste plants
 4. secondary heat sources, including both environmental and waste heat
 5. opportunities for low and ambient temperature heat networks
 6. possible land for energy centres and/or energy storage
 7. possible heating and cooling network routes
 8. opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
 9. infrastructure and land requirements for electricity and gas supplies
 10. implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector
 11. opportunities to maximise renewable electricity generation and incorporate demand-side response measures.
- C. Development Plans should:
 1. identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure
 2. 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.
- D. 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:
 2. connect to local existing or planned heat networks
 3. use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)

4. 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)
 5. use ultra-low NOx gas boilers
 6. 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
 7. 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.
- E. Heat networks should achieve good practice design and specification standards for primary, secondary and tertiary systems comparable to those set out in the CIBSE/ADE Code of Practice CP1 or equivalent.

Policy SI 4 Managing heat risk

- A. 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.

Policy SI 5: Water infrastructure

- A. In order to minimise the use of mains water, water supplies and resources should be protected and conserved in a sustainable manner.
- B. Development Plans should promote improvements to water supply infrastructure to contribute to security of supply. This should be done in a timely, efficient and sustainable manner taking energy consumption into account.
- C. Development proposals should:
- 1) through the use of Planning Conditions minimise the use of mains water in line with the Optional Requirement of the Building Regulations (residential development), achieving

mains water consumption of 105 litres or less per head per day (excluding allowance of up to five litres for external water consumption)

- 2) achieve at least the BREEAM excellent standard for the 'Wat 01' water category¹⁶⁴ or equivalent (commercial development)
 - 3) incorporate measures such as smart metering, water saving and recycling measures, including retrofitting, to help to achieve lower water consumption rates and to maximise future-proofing.
- D. In terms of water quality, Development Plans should:
- 1) promote the protection and improvement of the water environment in line with the Thames River Basin Management Plan, and should take account of Catchment Plans
 - 2) support wastewater treatment infrastructure investment to accommodate London's growth and climate change impacts. Such infrastructure should be constructed in a timely and sustainable manner taking account of new, smart technologies, intensification opportunities on existing sites, and energy implications. Boroughs should work with Thames Water in relation to local wastewater infrastructure requirements.
- E. Development proposals should:
- 1) seek to improve the water environment and ensure that adequate wastewater infrastructure capacity is provided
 - 2) take action to minimise the potential for misconnections between foul and surface water networks.
- F. Development Plans and proposals for strategically or locally defined growth locations with particular flood risk constraints or where there is insufficient water infrastructure capacity should be informed by Integrated Water Management Strategies at an early stage.

3 Sustainability Strategy

3.1 Energy Performance

An energy strategy has been developed following the energy hierarchy ‘Be Lean, Be Clean, Be Green’, ‘Be Seen’. Energy calculations using Building Regulations approved and accredited software have been undertaken at each stage to calculate the savings associated with the measures incorporated. The energy strategy is detailed within the “230906 Frederick Morfill House Energy Strategy”.

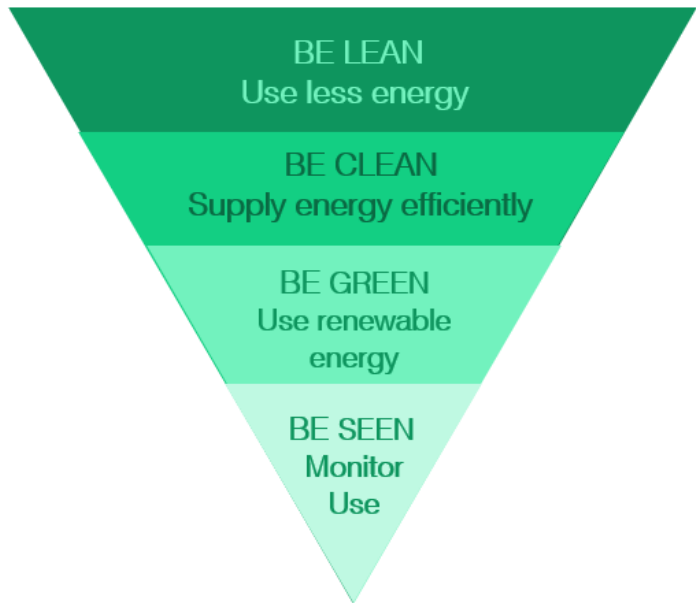


Figure 3-01 The Energy Hierarchy

The energy consumption and carbon emission figures have been calculated using the Standard Assessment Procedure for the Energy Rating of Dwellings (SAP) calculations have been carried out for the residential units. These are used to assess the impact on energy demand and CO₂ emissions of improvements through the hierarchy and demonstrate the most appropriate solution for the development to meet the relevant planning requirements.

As required by the London Plan, the development follows the energy hierarchy, incorporating passive design measures, energy efficient equipment and renewable energy.

The development employs an efficient building fabric, including well insulated walls and highly efficient glazing, efficient systems and Waste Water heat recovery systems. The development achieves a 65% reduction in CO₂ emissions over the baseline. The fabric performance is exceptionally high and glazing specifications balance the energy, daylight and overheating requirements.

Solar Gain Control and Daylight

Solar gains are a passive form of heating from the sun’s radiation and are beneficial to a building during winter months as they provide an effective source of heat and reduce internal heating requirements. However, summer months they must be controlled in order to mitigate the risk of overheating. They can be controlled through glazing and shading design in order to allow low level winter sun to enter the building and to limit access to high level summer sun.

The glazing strategy design has carefully considered orientation and window size in order to maximise daylight while controlling excessive solar gains. Glazing will incorporate low emissivity coatings to limit overheating without compromising light transmittance

Overheating

The building follows the steps in the cooling hierarchy to minimise overheating. A separate dynamic overheating assessment has been conducted, please refer to the overheating report for further details. The overheating assessment is detailed within ‘230906 Frederick Morfill House Overheating Assessment’.

3.2 Water efficiency

Water fittings will be specified with the following or similar flow rates to meet the target water consumption of 105 l/p/day for the residential aspect of the development:

- Wash basin taps – 6.5 l/min
- Showers – 7.5 l/min
- Bath – 120l to overflow
- Dishwasher - 1.2 l/place setting
- Washing machine - 9 l/kg load
- WC – 6/4 litre dual flush
- Kitchen taps – 6.5 l/min

Water meters will be installed to encourage residents to limit their consumption.

Water reduction targets will be in line with building control. The development will incorporate waste water heat recovery, flow restrictors to showers and taps and will be designed to minimise water usage per person per day.

3.3 Materials

Materials will be specified to reduce the embodied carbon of the development, wherever possible. This will be achieved through both effective material selection and design optimisation to minimise required material masses.

Insulating materials will be specified to maximise thermal performance whilst still paying attention to the environmental impact of the materials used, by specifying mineral wool. If possible, materials with a high recycled content will be specified.

Responsible sourcing will also be pursued. All timber used on site during the construction phase and within the building will be from legal sources. Where possible, FSC or equivalent timber will be used. Sourcing of other materials will include products where the manufacturer employs an environmental management system such as ISO 14001 or BES 6001. Where possible, materials will be sourced locally.

Non-toxic materials will be used wherever possible, including the specification of products with low VOC content in line with European testing standards.

All the building elements will achieve high ratings on the BRE Green Guide to Specification. Materials will be specified to have a low embodied energy, taking into account whole life cycle analysis.

3.4 Waste Management and Construction

Construction site waste will be managed in such a way to reduce the amount of waste produced as much as possible, and the waste hierarchy will be followed. In addition, at least 85% of waste that does arise will be recycled using an external waste contractor.

Regular waste and recycling bins will be provided for separation of waste to facilitate recycling.

Please refer to the “230906 Frederick Morfill House Operational Waste Strategy” for more details.

3.5 Nature Conservation and Biodiversity

The site is considered to be of negligible ecological value. Measures will be taken during construction to minimise impact on ecology by timing works appropriately and following best practice guidance. The green spaces will incorporate native planting. Please refer to any separate ecological reports.

3.6 Climate Change Adaptation

Tackling Increased Temperature and Drought

A separate overheating assessment was conducted, demonstrating the resilience of the development to overheating. Windows will incorporate low emissivity coatings to reduce solar gain, and overhangs are built to some of the windows. Mechanical cooling is also provided.

As described above in water consumption, measures have been put in place to reduce potable water use internally. There is limited planting associated with the development and this will all be specified to be drought resistant rely mainly on rainwater.

Flooding

The development is in flood Zone 1 and therefore has a low probability of flooding from rivers and the sea.



Figure 3-1 Frederick Morfill House N22 8DG Flood Risk Zone Map

Surface water runoff will be reduced by ensuring surface water is separate to mains foul drainage.

3.7 Pollution Management

Air Quality

The construction site will be managed in such a way that the environmental impact is minimised. This includes following best practice policies for dust pollution by using dust sheets, covering skips and damping down where appropriate.

Plant and machinery

All plant and equipment installed in the development will be appropriately sized and selected for efficiency in order to reduce greenhouse gas emissions.

All equipment will be frequently maintained to ensure it continues to run efficiently and cleanly.

Insulating materials and heating systems will be specified to keep pollutants to a minimum. Insulation will have a low Global Warming Potential (GWP).

Noise

The development will comply with Building Regulations Part E, providing a good level of sound insulation. All windows are to be specified as high efficiency double glazing to minimise the transmission of noise between the property and surrounding area.

Light Pollution

All external lighting will be adequately controlled to ensure that spaces are only lit out of daylight hours and when the area is occupied. As the proposed building use is residential; there will be no illuminated signage or uplighting incorporated. The proposed dwellings are in a highly urbanised location, and therefore will not significantly contribute to increasing the effects of light pollution.

3.8 Transport and Accessibility

Sustainable methods of transport have been prioritised, with bike storage being provided.

4 Conclusion

The development follows the energy hierarchy, incorporating passive design measures and energy efficient equipment. The development employs an efficient building fabric, including efficient insulation and highly efficient glazing, efficient heating strategy and renewable systems. Measures are also incorporated to minimise pollution, reduce the embodied carbon footprint of the development and reduce water use. A separate energy strategy and overheating assessment have been conducted. Please refer to these documents for more detail.

The development complies with sustainability policy of the London Borough of Haringey and the London Plan, for major developments.