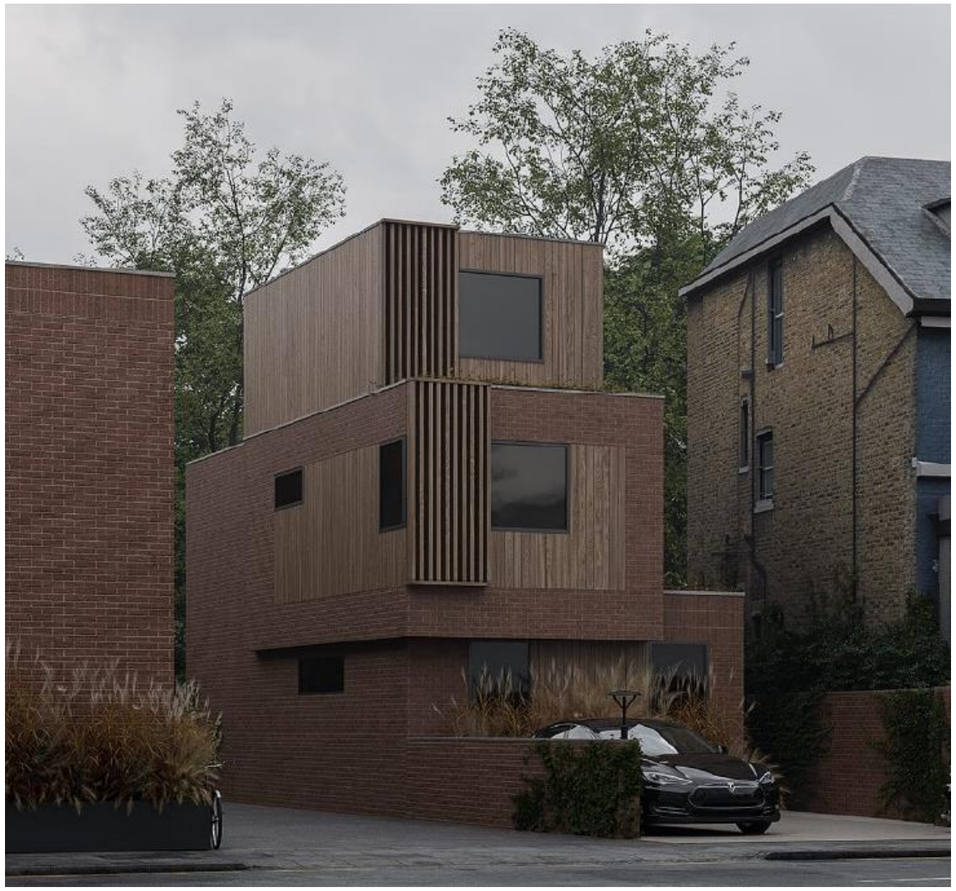

Energy & Sustainability Statement

Land to the rear of 19-23 Friar's Stile Road

Date Published: 10th July 2023
Author: Alice Thwaites-Rice
Reviewer: Jess James
Version: 1

Contents

Executive Summary

This energy statement has been prepared in order to assess the improvement in energy performance as a result of the proposed development at the land to the rear of 19-23 Friar's Stile Road. The site of the development is located within the London Borough of Richmond upon Thames.

The development comprises the demolition of single storey garages and the construction of a 3 storey dwelling and basement.

An energy assessment has been carried out based on design information to identify the most appropriate way to reduce CO_2 emissions and energy demand.

Following the thermal and M&E equipment upgrades described, the energy strategy for the proposed building has been demonstrated to be capable of achieving an improvement of 60.96% CO_2 emissions.

1 Introduction

This energy & sustainability statement has been prepared for the development at the land to the rear of 19-23 Friar's Stile Road. The development comprises a 3 storey dwelling and basement.

This statement summarises the sustainable design and construction measures that have been incorporated into the project in order to meet the sustainability requirements of the London Borough of Richmond upon Thames and the London Plan.

1.1 Assessment approach

This report summarises the work undertaken to support the development of an energy strategy for the new development, following the energy hierarchy 'Be Lean, Be Clean, Be Green, Be Seen'.

Standard Assessment Procedure for the Energy Rating of Dwellings (SAP) calculations have been carried out for the residential unit. These are used to assess the impact on energy demand and CO_2 emissions of improvements through the hierarchy and demonstrate the most appropriate solution for the development to meet the relevant planning requirements.

2 Policy

This development consists of one dwelling unit and does not surpass the requirement for a major development, therefore the London plan and London Borough of Richmond upon Thames referring to major developments are not relevant.

2.1 London Borough of Richmond upon Thames – Local Plan

Policy LP 22: Sustainable Design and Construction

A. Developments will be required to achieve the highest standards of sustainable design and construction to mitigate the likely effects of climate change. Applicants will be required to complete the following:
1. Development of 1 dwelling unit or more, or 100sqm or more of non-residential floor space (including extensions) will be required to complete the Sustainable Construction Checklist SPD. A completed Checklist has to be submitted as part of the planning application.
2. Development that results in a new residential dwelling, including conversions, change of use, and extensions that result in a new dwelling unit, will be required to incorporate water conservation measures to achieve maximum water consumption of 110 litres per person per day for homes (including an allowance of 5 litres or less per person per day for external water consumption).
3. New non-residential buildings over 100sqm will be required to meet BREEAM 'Excellent' standard.
4. Proposals for change of use to residential will be required to meet BREEAM Domestic Refurbishment 'Excellent' standard (where feasible).

Reducing Carbon Dioxide Emissions
B. Developers are required to incorporate measures to improve energy conservation and efficiency as well as contributions to renewable and low carbon energy generation. Proposed developments are required to meet the following minimum reductions in carbon dioxide emissions:
1. All new major residential developments (10 units or more) should achieve zero carbon standards in line with London Plan policy.
2. All other new residential buildings should achieve a 35% reduction.
3. All non-residential buildings over 100sqm should achieve a 35% reduction. From 2019 all major non-residential buildings should achieve zero carbon standards in line with London Plan policy.

Targets are expressed as a percentage improvement over the target emission rate (TER) based on Part L of the 2013 Building Regulations.
C. This should be achieved by following the Energy Hierarchy:
1. Be lean: use less energy
2. Be clean: supply energy efficiently
3. Be green: use renewable energy

2.2 The London Plan Policies on Energy

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.

This is not a major development, but will follow the energy hierarchy in line with Wandsworth's requirements. The other London Plan policies do not apply.

3 Energy Strategy

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.

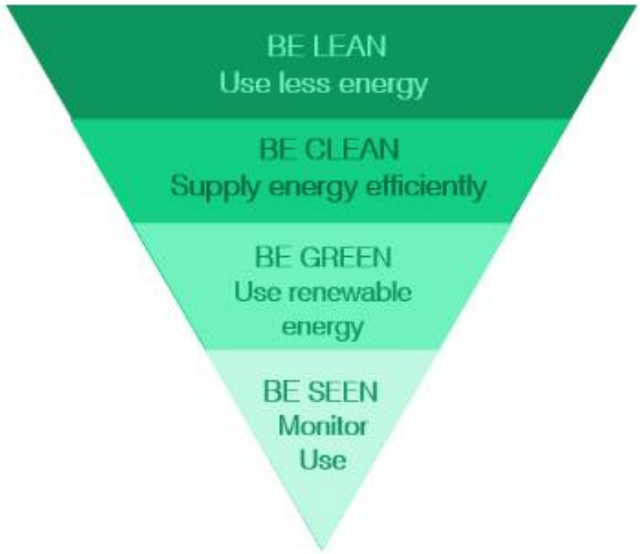

Figure 3.1 The Energy Hierarchy

The energy consumption and carbon emission figures within this report have been calculated using the approved Standard Assessment Procedure for the Energy Rating of Dwellings (SAP).

3.1 Energy Targets

Table 3.1 below details the energy and carbon breakdown of the Part L target emission rate. These have been calculated using the SAP10 carbon factors.

Energy (kWh/yr)					Electricity CO_2 (kg/yr)	Total Energy (kWh/yr)	Total CO_2 (kg/yr)
Heating	Hot Water	Pumps & Fans	Lighting	PV			
7,651	3,157	86	278	-2,254	-239	**8,918**	**2,030**

Table 3.1 Target regulated energy demand and carbon emissions per energy source

3.2 Be Lean

As part of the Be Lean approach, passive design measures have been considered throughout the pre-planning stage to reduce initial energy demand.

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, during 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.

Building Fabric

Designing an efficient thermal envelope will greatly reduce the need for space heating and cooling as heat transmittance through the thermal elements is reduced. Low air permeability rates will also reduce heating and cooling energy demand by reducing the volume of air that can penetrate the building. As part of a 'fabric first' approach, the building fabric has been carefully considered and specified to meet or exceed current Building Regulations minimum requirements, as detailed in table 3.2.

Fabric Component	Residential Specification
External Walls	0.13 W/m^2K
Basement Walls	0.13 W/m^2K
Roof	0.12 W/m^2K
Basement Floor	0.12 W/m^2K
Exposed Floor	0.12 W/m^2K
Windows	Triple Glazing 0.8 W/m^2K, G=0.4
Rooflights	1.2 W/m^2K, G=0.4
External Doors	1.2 W/m^2K
Air Tightness	$4m^3/m^2/h$
Thermal Bridging	Maximum Psi values are outlined in table 3.3 Requires further calculation at detailed design

Table 3.2 Proposed Be Lean passive design measures

Thermal Bridge	Psi Value
Other lintels (including other steel lintels)	0.30
Sill	0.04
Jamb	0.04
Basement Floor	0.07
Intermediate floor within a dwelling	0.07
Flat roof with parapet	0.56
Corner (normal)	0.09
Corner (inverted)	-0.09
Party wall – Roof	0.24

Table 3.3 Initial thermal bridge Psi values used in the model

Building Services

Services have been specified to maximise efficiency therefore reducing energy used. Table 3.4 shows the proposed services strategy and energy efficiency measures for the development.

Services Component	Residential Specification
Heating distribution & water storage	Underfloor Heating 300L hot water cylinder Measured Loss: 1.9kwh\day
Cooling	-
Heating Controls	Time and temperature zone control
Ventilation	Natural Ventilation
Lighting & Controls	100% Low Energy Lighting

Table 3.4 Proposed energy efficient design measure

3.3 Be Green

Renewable systems

An Air Source Heat Pump (ASHP) has been identified as the most appropriate technology for the development.

System	Residential Specification
ASHP	Induvial Air Source Heat Pump (ASHP) system providing 100% of heat and hot water 8.5kW SCOP 3.27

Table 3.5 Proposed LZC specifications

ASHP System

The specified heat pump will need to be taken from the SAP appendix Q database to allow the correct efficiencies to be applied. For the purposes of this preliminary assessment, we have used the Mitsubishi Ecodan 8.5kW heat pump.

3.4 Energy and Carbon Savings

Energy Use

The breakdown of carbon and energy use has been identified for the site. Table 3.6 shows the breakdown of carbon and energy use for regulated energy uses once the strategies proposed in this report are incorporated.

Space Heat	Hot Water	Pumps & Fans	Lighting	Total	Electricity CO_2 (kg/yr)
2,495	2,462	0	395	5,352	793

Table 3.6 Estimated regulated energy demand and carbon emissions per energy source

Carbon Savings

Table 3.7 demonstrates the percentage improvement in emission reduction over the notional baseline levels for the development considering only regulated energy use and associated emissions.

	CO_2 Emissions (T/yr)	CO_2 Savings (T/yr)	% Saving
Building Regulations 2021 Baseline	2.03		
Proposed Building	0.79	1.24	60.96%

Table 3.7 Regulated emissions improvements over Part L

The SAP calculations also confirm that the proposed development performs above the Fabric Energy Efficiency (TFEE), Primary Energy Rate (TPER) and Emission Rate (TER) targets. This is outlined in Table 3.8.

Dwelling Fabric Energy Efficiency Improvement Over the TFEE	Dwelling Primary Energy Rate over the TPER	Dwelling Emission Rate over the TER
5.83%	22.70%	60.96%

Table 3.8 performance of the proposed development over the TFEE, TPER and TER

3.5 Water efficiency

Water fittings will be specified with the following or similar flow rates to meet the target water consumption of 105L/Person/Day in line with London plan and London Borough of Richmond upon Thames water efficiency requirements:

- 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.

3.6 Materials

All timber used on site during the construction phase and within the building will be from legal sources, 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.

Taking into account embodied carbon, where possible, low life cycle cost items will be selected. However, other factors, such as site restriction, cost and aesthetic preferences are considered when making design choices.

3.7 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 and the Civil Engineer's Demolition Protocol. This will encourage materials to be re-used on site or where this is not possible, salvage appropriate materials to enable use off-site.

Household waste will be recycled through the local authority collection scheme. Internal recycling bins in a kitchen cupboard will be provided to facilitate this.

3.8 Nature Conservation and Biodiversity

The site is occupied by existing buildings and minimal vegetation and is therefore considered to be of low ecological value. Care will be taken during construction to avoid damage to any existing trees. Measures will be taken during construction to minimise impact on ecology by timing works appropriately and following best practice guidance. Landscaping and native planting will be incorporated into the scheme. Urban greening opportunities will be maximised where possible to the rear and front of the proposed development.

3.9 Climate Change Adaptation

Tackling Increased Temperature and Drought

Windows will incorporate low emissivity coatings to reduce solar gain. Other than mandatory ventilation to meet AD Part F, the development utilises a natural ventilation strategy.

Flooding

The site is in a low flood risk zone as shown and will not increase the impermeable area.

Figure 3.1 Land to the rear of 19-23 Friar's Stile Road Flood Risk Map

3.10 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.

Noise

The dwellings will comply with Building Regulations Part E providing a good level of sound insulation. All windows are to be specified as high efficiency triple 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 up lighting incorporated. The proposed dwelling is in a highly urbanised location, and therefore will not significantly contribute to increasing the effects of light pollution.

4 Conclusion

This sustainability statement has been prepared for the development at the land to the rear of 19-23 Friar's Stile Road. The development comprises a single new dwelling.

The development follows the energy hierarchy, incorporating passive design measures and energy efficient equipment. The development employs an efficient building fabric, including highly efficient insulation and highly efficient glazing, and an ASHP to maximise carbon savings for the site, resulting in 60.96% savings over the Target Emissions Rate. Measures are also incorporated to minimise pollution and reduce water use. The development complies with sustainability policy of the London Borough of Richmond upon Thames and the London Plan, for minor developments.

The figures within this report are based on preliminary analysis only and further detailed studies will be required at the detailed design stage before specifying any of the proposed systems.