Raglan House Limited

Raglan House, Raglan Street, London, NW5 3DB

Energy and Sustainability Strategy

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Version 03

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JAWSustainability

Contents

1 Introduction

This report summarises the proposed energy and sustainability strategy for the refurbishment and extension of Raglan House on Raglan Street, in order to meet the sustainability requirements of the London Borough of Camden and the London Plan.

The development consists of the extension and change of use of existing day centre (Use Class D1) to create 6 (3 x 2 bed and 3 x 3-bed) residential dwellings (Use Class C3) comprising the demolition of the existing first floor conservatory and new first floor extension; two storey extension onto Anglers Lane; conversion and extension of the roof space including introduction of new dormer windows in the front and rear elevations; insertion of new doorways at ground floor level and associated minor alterations to the railings. The proposed ground floor layout is shown in Figure 1-1.

Figure 1-1 – Ground floor layout

2 Policy

The following policies from the London Plan and Camden local plan have been identified as having requirements most relevant to the sustainability strategy of the development.

2.1 The London Plan

Policy 5.2: Minimising Carbon Dioxide Emissions

Development proposals should make the fullest contribution to minimising carbon dioxide emissions in accordance with the following energy hierarchy:

- Be lean: use less energy
- Be clean: supply energy efficiently
- Be green: use renewable energy

Policy 5.3 Sustainable Design and Construction Strategic

Development proposals should demonstrate that sustainable design standards are integral to the proposal, including its construction and operation, and ensure that they are considered at the beginning of the design process.

2.2 Camden Local Plan

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. We will:

a. Promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy;
b. Require all major development to demonstrate how London Plan targets for carbon dioxide emissions have been met;
c. 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;
d. support and encourage sensitive energy efficiency improvements to existing buildings;
e. Require all proposals that involve substantial demolition to demonstrate that it is not possible to retain and improve the existing building; and
f. Expect all developments to optimise resource efficiency. For decentralised energy networks, we will promote decentralised energy by:
g. working with local organisations and developers to implement decentralised energy networks in the parts of Camden most likely to support them;
h. Protecting existing decentralised energy networks (e.g. at Gower Street, Bloomsbury, King's Cross, Gospel Oak and Somers Town) and safeguarding potential network routes; and
i. Requiring all major developments to assess the feasibility of connecting to an existing decentralised energy network, or where this is not possible establishing a new network.

To ensure that the Council can monitor the effectiveness of renewable and low carbon technologies, major developments will be required to install appropriate monitoring equipment.

Policy CC2 Adapting to climate change

The Council will require development to be resilient to climate change.

All development 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.

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.

Sustainable design and construction measures

The Council will promote and measure sustainable design and construction by:

e. Ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
f. Encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;
g. Encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve “excellent” in BREEAM domestic refurbishment; and
h. Expecting non-domestic developments of 500 sqm of floorspace or above to achieve “excellent” in BREEAM assessments and encouraging zero carbon in new development from 2019.

2.3 Building Regulations Part L1B

Material Change of Use

The refurbishment section of the project, converting an existing non-residential building to residential units, falls within the *Material change of use* of Part L1B. The paragraph 4.11 describes that *Material change of use* could include one of the following:

- Buildings that are used as a dwelling, where previously they were not;
- Buildings that contain a flat, where previously they did not; or
- Buildings, which contain at least one dwelling, contain a greater or lesser number of dwellings that they did not previously

In normal circumstances, reasonable provision where there is a material change of use or a change to the building’s energy status:

- Where controlled services or fittings are being provided or extended, to meet the standards set out in Part L1B / Part L2B. If the area of openings is more than 25% of the total floor area, either openings should be reduced, or the area be compensated
- Where the work involves the provision of a thermal element, to meet the standards set out in Part L1B / Part L2B
- Where the thermal element is being retained, to upgrade it if applicable to meet the standards set out in Part L1B / Part L2B
- Where an existing window or door which separates a conditioned space from an unconditioned space has a U-value worse than 3.3 W/m^{2}K, to provide a replacement to meet the standards set out in Part L1B / Part L2B

3 Energy Strategy

An energy strategy has been developed following the energy hierarchy 'Be Lean, Be Clean, Be Green'. Energy calculations using Building Regulations approved and accredited software have been undertaken at each stage to calculate the savings associated with the measures incorporated.

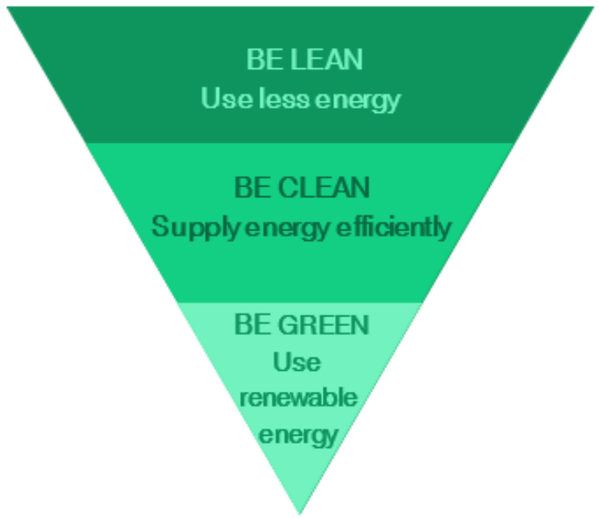

Figure 3-1 The Energy Hierarchy

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) for the residential properties.

3.1 Energy Targets

Material Change of Use

As per the Part L1B material change of use criteria, all the minimum fabric standards for the existing units have been met. However, the criteria also require that where the glazing to floor area ratio is more than 25% that this is compensated for.

Table 3-3 demonstrates the ratio of the total openings' area to the total floor area of the proposed units.

Unit Number	Area (m^2)	Glazed area	Glazed area to floor ratio
1	75.1	30.1	40.1%
2	95.8	22.72	23.7%
3	90.3	25.32	28.0%
4	90.2	24.02	26.6%
5	70.5	21.9	31.1%
6	84.3	27.79	32.9%

Table 3-3 Glazing to floor area ratio

Units 1,3,4,5 and 6 have a glazing ration of over 25%. For these units it is necessary to show that the presence of additional glazed area is compensated for by comparing the actual DER of the units to the DER of a 'Notional' case where the minimum standards are met.

3.2 Building Fabric & Services Performance

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.

Overheating

The impact of solar gains has been analysed as part of the SAP calculations, taking into account the ventilation strategies and the risk of solar overheating has been concluded to be not significant, when measured against the Part L1A criteria.

Windows are specified to incorporate low emissivity coatings to limit overheating while ensuring adequate daylight.

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.

The building currently consists of solid brick walls. The windows are single glazed. As part of the works, the existing walls will be insulated to Part L1B standards. The ground floor and new walls will exceed minimum standards for Part L. The existing windows will be replaced with new double glazed windows. Table 3-1 provides details of the strategy.

Fabric Component	Existing fabric	Efficient Specification Proposed	Minumum requirement for Part L 1B / L1A
Existing External Walls	2.1W/m^{2}K	0.30 W/m^{2}K	0.30 W/m^{2}K
New walls	2.1W/m^{2}K	0.30 W/m^{2}K	0.30 W/m^{2}K
Party Walls	-	Filled cavity with edge sealing	-
Ground floor	0.5 W/m^{2}K	0.25 W/m^{2}K	0.25 W/m^{2}K
Roof	2.3 W/m^{2}K	0.18 W/m^{2}K	0.18 W/m^{2}K
New Windows	6 W/m^{2}K	1.4 W/m^{2}K	1.6 W/m^{2}K
External Doors	1.8 W/m^{2}K	1.8 W/m^{2}K	1.8 W/m^{2}K
Thermal Bridging	Default	Default	Default

Table 3-4 Proposed Be Lean passive design measures for the residential sections

Building Services

Individual systems have been identified as being the most appropriate for the site. These have been specified to maximise efficiency therefore reducing energy used to deliver services.

Services Component	Efficient Specification
Space Heating & hot water	Standard Gas Boiler - 90% Efficiency Space heating delivered by: Radiators
Heating Controls	Time and temperature zone control
Ventilation	Natural ventilation
Lighting & Controls	100% low energy lighting

Table 3-6 shows the proposed services strategy assumptions used in the energy modelling for the development.

Services Component	Efficient Specification
Space Heating & hot water	Standard Gas Boiler - 90% Efficiency Space heating delivered by: Radiators
Heating Controls	Time and temperature zone control
Ventilation	Natural ventilation
Lighting & Controls	100% low energy lighting

Table 3-6 Proposed services assumptions for residential spaces

Renewable and Low Carbon Technology

The feasibility of various renewable and low carbon technologies has been investigated for the development. The proposals consist of a refurbishment of a heritage building so are constrained by the existing fabric, location and size of the development. Only solar technologies are feasible at this scale of development, an these could only go on the front roof as they are the most southerly facing. Due to the heritage nature of the building this would not be considered acceptable therefore no renewable technologies are proposed for the building.

Energy Use

The breakdown of carbon and energy use has been identified for the development. Table 3-7 shows the breakdown of carbon and energy use once the strategies proposed in this report are incorporated.

Gas (kWh/yr)			Gas CO2 (kg/yr)	Electricity (kWh/yr)			Electricity CO2 (kg/yr)	Total Energy	Total CO2
Space Heating	Hot Water	Total		Pumps & Fans	Lighting	Total			
36,401	14,318	50,718	10,955	450	2,147	2,597	1,348	53,316	12,303

Table 3-7 Estimated regulated energy demand and carbon emissions per energy source

Carbon Saving

Table 3-5 and Figure 3-3 demonstrate the percentage improvement over the existing building.

Energy Hierarchy stage	CO_2 Emissions (T/yr)	CO_2 Savings (T/yr)	% Saving
Existing building carbon emissions	27.84		
Proposed building carbon emissions	12.30	15.53	56%

Table 3-9 New Build improvements over Part L

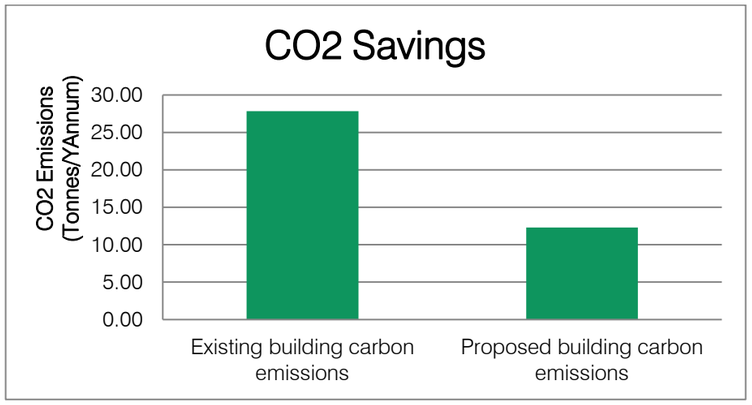

Figure 3-3 New Build Site Wide Improvement over Building Regulations Part L 2013

Material Change of Use

As per the requirements of Part L1B for material change of use, the performance of the houses has been compared to a notional version of each property, as the glazed area is over the minimum 25%.

The results of this comparison are shown in table 3-10 below.

Unit Number	Notional Building DER (kgCO2/yr/m2)	Proposed Building DER (kgCO2/yr/m2)
1	27.75	27.64
3	23.18	22.90
4	23.39	23.18
5	24.96	24.76
6	25.95	25.61

Table 3-10 Notional and actual DER

4 Sustainability

4.1 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:

- 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.

4.2 Materials

Insulating materials will be specified to maximise thermal performance whilst still paying attention to the environmental impact of the materials used. The use low embodied energy products will be further investigated.

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, considering whole life cycle analysis.

4.3 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.

Household waste will be recycled through the local authority collection scheme. Each unit will be provided with its own separate waste and recycling bins. The development will have refuse stores integrated on the ground floor, which will provide separate bins for waste and recycling.

4.4 Nature Conservation and Biodiversity

The site is occupied by existing buildings so is not expected to have significant ecological value. The development will attempt to increase biodiversity through the provision of gardens at roof level, which should incorporate native planting where possible.

Measures will be taken during construction to minimise impact on ecology by timing works appropriately and following best practice guidance.

4.5 Climate Change Adaptation

Tackling Increased Temperature and Drought

The impact of solar gain has been incorporated into the SAP analysis for compliance with Part L and the risk of solar overheating has been concluded to be low for the development.

Windows will incorporate low emissivity coatings to reduce solar gain. The residential units will be provided with openable windows to provide natural ventilation.

Flooding

The peak and volume of surface water run-off rates will not be increased due to the development, as the site is existing hard standing and buildings so the impermeable area will not increase. The development is located in a low flood risk zone.

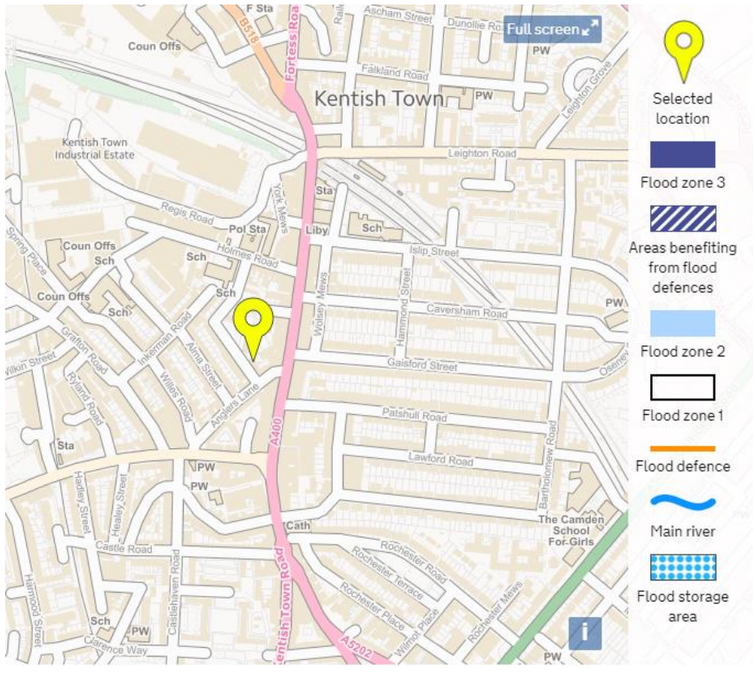

Figure 4-1 Flood Risk Map

4.6 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 and have a low NO_x emission value. 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.

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

External lighting will be adequately controlled to ensure that it does not run unnecessarily. The proposed development is in a highly urbanised location, and therefore will not significantly contribute to increasing the effects of light pollution.

5 Conclusion

This report summarised the proposed energy and sustainability strategy for development of Raglan House in order to meet the sustainability requirements of the London Borough of Camden and the London Plan. The building is an existing day care centre that is now vacant. The development consists of the extension and change of use of an existing day centre (Use Class D1) to create 6 (3 x 2 bed and 3 x 3-bed) residential dwellings (Use Class C3) comprising the demolition of the existing first floor conservatory and new first floor extension; two storey extension onto Anglers Lane; conversion and extension of the roof space including introduction of new dormer windows in the front and rear elevations; insertion of new doorways at ground floor level and associated minor alterations to the railings.

Relevant policies have been identified and the development will follow the energy hierarchy and incorporate passive design measures and energy efficient equipment. The measures identified will be used to achieve a 56% improvement over the existing development. Compliance has also been demonstrated for the refurbishment and change of use sections of the development. Measures will also be incorporated to minimise pollution, reduce water use and protect biodiversity.