

# AVAL



## **Energy and Sustainability Assessment**

**Site: 1,3,5 Agar Grove, London, NW1 9SL**

Client

**Neil Hawes & Associates Limited**

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## 1. Introduction

### 1.1 Overview

Neil Hawes & Associates Limited (NHAL) is seeking consent regarding the single-storey rear extension to the above properties and conversion of the existing lower and raised ground floor maisonette into 3 self-contained flats at 1,3,5 Agar Grove, NW1 9SL (hereafter referred to as the 'proposed development').

AVAL Consulting Limited (ACL) was instructed by NHAL Architects to produce an Energy and Sustainability Statement to accompany the planning application to the London Borough of Camden (LBC) for consent to undertake the proposed work.

The existing buildings are split into 3 self-contained flats (1 x 4 beds maisonette over lower and upper ground floors and 2 x 1 bed flat) for each semi-detached house, all accessed from the single main front entrance.

The proposal is to build a single -storey rear extension and conversion of the existing lower and raised ground floor maisonette into 2 self-contained flats (1 x 3 beds at lower ground floor level and 1 x 1 bed flat at raised ground floor level) for each semi-detached house.

Figure 1.1 and 1.2 below shows the building footprint for the extension and rearrangement of the floors.

Based on the requirement for appropriate climate change adaptation measures such as bio-diverse roofs (Policy CC2 and Policy A3) the development include a green roof as shown in figure 1.2

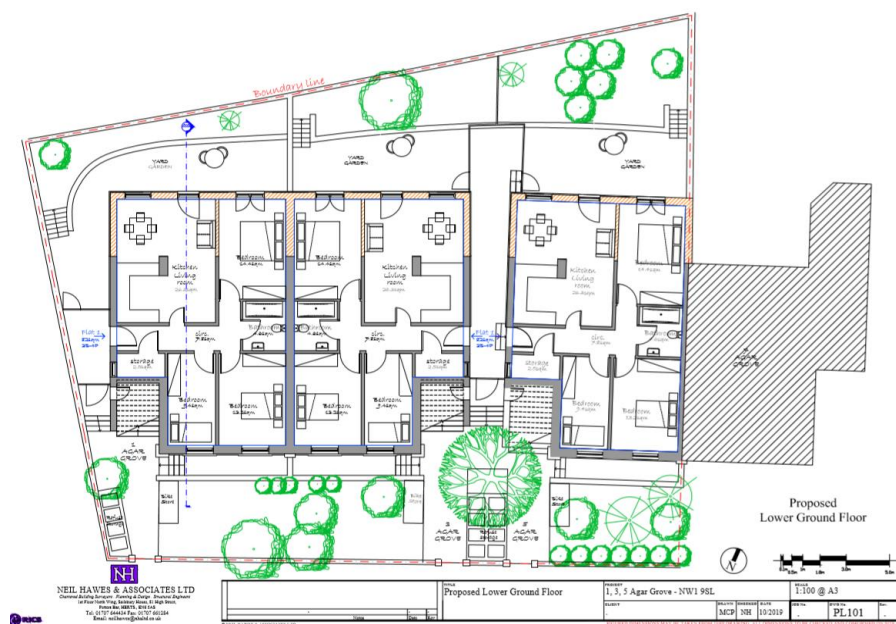
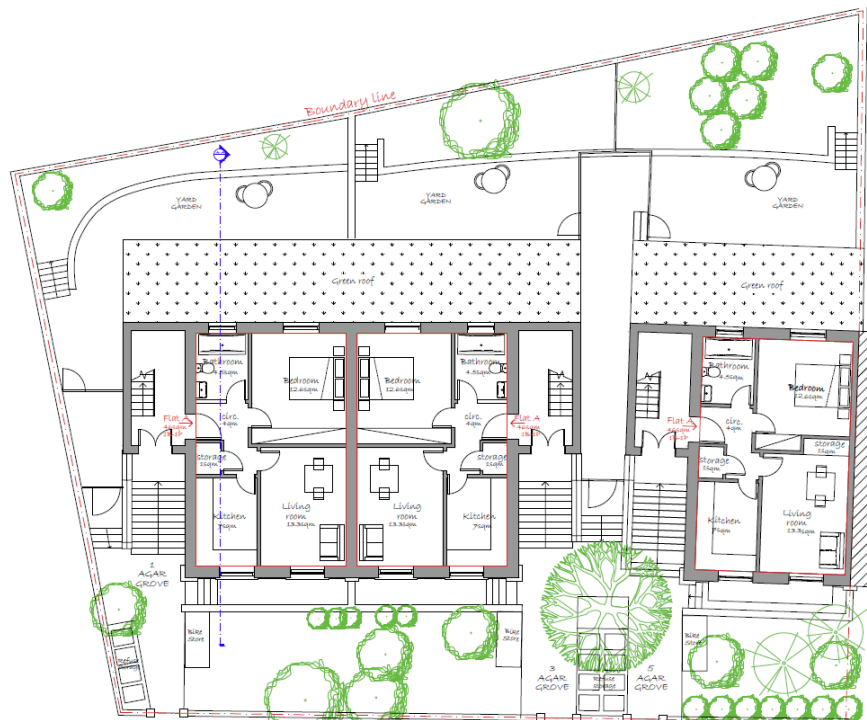


Figure 1.1: Proposed Lower Ground floor Layout



**Figure 1.2: Proposed upper Ground floor Layout**

The Energy strategy proposed adheres to the principles of the energy hierarchy by proposing "Lean and Green" measures in order to reduce the overall energy consumption and use onsite renewable technology to reduce carbon emissions from the development.

The methodology and measures used are outlined below:

**Be "Lean" - Use less energy:** This first step deals with the reduction in energy use, through the adoption of sustainable design and construction measures. The development intends to achieve a carbon emission reduction through energy efficiency measures alone, by adopting standard levels of insulation, which exceed current Building Regulations (2013) requirements. Energy demand reduction measures incorporated include:

- High levels of insulation, which exceed current Building Regulations (2013) requirements;
- High performance glazing;
- 100% Low energy lighting;
- Low Air Permeability; and
- Natural Lighting;

**Be "Clean" - Supply energy efficiently:** There is no installed district heating scheme in the immediate vicinity of the site and the proposed development is considered to be too small to successfully incorporate a community heating system.

Combined heat and power (CHP) has been assessed in terms of feasibility. CHP systems are usually needed where there is a large heat demand therefore, it has not been considered as appropriate for the proposed scheme.

**Be "Green" - Use renewable energy:** As per paragraph 8.11 of the Camden Local Plan, developments (including refurbishments) of 5 or more dwellings and/or 500 sqm or more of any gross internal floorspace must demonstrate a 20% 'Be Green'.

The extension will create less than 100 sqm of additional floor space, therefore, the development is considered too small to require additional renewable energy source.

## 1.2 Sustainable Design and Construction Measures

Sustainable Design and Construction measures incorporated in the development are in accordance with Royal Borough of Camden Core Strategy 2017 and London Plan 2011 (with alterations).

- **Design:** Design measures capable of mitigating and adapting to climate change and proposed energy strategy will follow the energy hierarchy in order to reduce CO<sub>2</sub> emissions.
- **High Efficacy Lighting:** Use of 100% energy efficient lighting.
- **Overheating:** The glazing design has taken into consideration the issue of overheating in hot weather.
- **Solar Gain for Heating:** Design will ensure that annual heat gains exceed heat losses.
- **Water Efficiency:** Water consumption will be reduced by incorporating water efficiency measures.
- **Noise Pollution:** Noise levels will be properly controlled during construction.
- **Waste Management:** A site waste management plan could be used to reduce and recycle waste during demolition and construction.
- **Green Building Materials:** Materials used in construction will be A or B rated in the BRE Green Guide Specification.
- **Health and Wellbeing:** Each dwelling has been designed to provide good levels of daylight for its occupants.
- **Travel:** Cycle storage will be incorporated in the design in order to encourage a sustainable method of travel.
- **Air Quality:** An Air Quality Neutral Assessment has been also considered to support the planning application. This has been undertaken in line with the methodology outlined in the Sustainable Design and Construction SPG<sup>1</sup>

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<sup>1</sup> Mayor of London (2014): 'Sustainable Design and Construction Supplementary Planning Guidance'

## 2. Legislation and 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
- e. Expect all developments to optimise resource efficiency. For decentralised energy networks, we will promote decentralised energy by:
  - f. 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

### Extension of a Dwelling

Based on the guidance, extending a residential building should meet the following reference methods:

### Fabric Standards

Reasonable provision would be for the proposed extension to incorporate the following:

- a. Newly constructed thermal elements that meet the minimum standards sets out in the guidance;
- b. Doors, windows, roof windows and rooflights to meet the minimum standards of the guidance; and
- c. Improvements to fabric elements to meet the standards within the guidance.

## Area of windows, roof windows and doors

A reasonable provision would be to limit the total area of windows, roof windows and doors in extensions so that it does not exceed the sum of:

- a. 25 percent of the floor area of the extension; and
- b. The total area of any windows or doors which, as a result of the extension works, no longer exist or are no longer exposed.

## 2.4 European Union

The EU sets legally binding limit values for outdoor air pollutants to be met by EU countries by a given date. These limit values are based on the World Health Organisation (WHO) guidelines on outdoor air pollutants. These are legally binding and set out to protect human health and the environment by avoiding, preventing or reducing harmful air pollution effects.

Revised National Planning Policy Framework 2019 – emphasise the concept of sustainable development by encouraging local authorities to adopt proactive strategies to mitigate and adapt to climate change. It recommends the move to a low carbon future by:

- Planning new development in locations and ways, which reduce greenhouse gas emissions.
- Actively supporting energy efficiency improvements to existing buildings; and
- When setting any local requirement for a building's sustainability do so in a way consistent with the Government's zero carbon buildings policy and adopts nationally described standards.

The government's Energy Policy, including its policy on renewable energy, is set out in the Energy White Paper. This aims to put the UK on a path to cut its carbon dioxide emissions by 60% by 2050. As part of the strategy for achieving these reductions the White Paper sets out, the Government's target to generate 20% of UK Electricity from renewables by 2020.

## 3. Energy Strategy

An energy strategy has been developed following the energy hierarchy 'Be Lean, Be Clean, Be Green'. Due to the small total area of extension (less than 100 sqm) detailed energy calculations using Building Regulations has been not carried out. However, energy efficient measures are proposed as detailed below.

### 3.1 Solar Gain and 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.

### 3.2 Overheating

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

### 3.3 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 include installation of a secondary glazing the enhance energy efficiency.

### 3.4 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. The proposed building services are shown in Table 3.1 for the converted new 3 X 1 bed upper ground floor flat. The existing lower ground floor standard gas boiler is to be retained to supply only within the lower ground floor.

**Table 3.1: Proposed services strategy**

Services Component	Efficient Specification
Space Heating & hot water	Standard Gas Boiler - 90% Efficiency    Space heating delivered by: Radiators

Services Component	Efficient Specification
Heating Controls	Time and temperature zone control
Ventilation	Natural ventilation
Lighting & Controls	100% low energy lighting

### 3.5 Renewable and Low Carbon Technology

As per paragraph 8.11 of the Camden Local Plan, developments (including refurbishments) of 5 or more dwellings and/or 500 sqm or more of any gross internal floorspace must demonstrate a 20% 'Be Green'.

The extension will create less than 100 sqm of additional floor space, therefore, the development is considered too small to require additional renewable energy source.

## 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 within the converted flats:

- 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 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

### 4.5.1 Tackling Increased Temperature and Drought

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

### 4.5.2 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 in a low flood risk zone.

## 4.6 Pollution Management

### 4.6.1 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 an appropriate dust management plan during construction phase of the development.

### 4.6.2 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<sub>x</sub> 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.

### 4.6.3 Noise

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

### 4.6.4 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 1,3,5 Agar Grove in order to meet the sustainability requirements of the London Borough of Camden and the London Plan.

The existing buildings are split into 3 self-contained flats (1 x 4 beds maisonette over lower and upper ground floors and 2 x 1 bed flat) for each semi-detached house, all accessed from the single main front entrance.

The proposal is to build a single -storey rear extension and conversion of the existing lower and raised ground floor maisonette into 2 self-contained flats (1 x 3 beds at lower ground floor level and 1 x 1 bed flat at raised ground floor level) for each semi-detached house.

Relevant policies have been identified and the development will follow the energy hierarchy and incorporate passive design measures and energy efficient equipment. Measures will also be incorporated to minimise pollution, reduce water use and protect biodiversity.

It can therefore be concluded that the proposed development is not considered to conflict with any national, regional, or local planning policy in relation to construction and operation phase dust and air quality nuisance.