9_367_FREDERICK STREET_SUSTAINABILITY STATEMENT_190710

3–7 Frederick Street

Produced by XCO2 for Project 5 Architecture LLP

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EXECUTIVE SUMMARY

The sustainability strategy for the proposed development at 3–7 Frederick Street has been developed with the design team to address the relevant environmental policies from the London Borough of Camden and the London Plan. Relevant energy policies have been addressed in the accompanying Energy Statement. The proposed Grade II Listed Building refurbishment is expected to achieve a maximum BREEAM rating of 'Good' and reduce on-site regulated carbon emissions by 25.7% over the existing building baseline with SAP 2012 emission factors.

This report outlines the sustainability strategy for the proposed development at 3–7 Frederick Street in line with the requirements set out by the London Plan and the London Borough of Camden.

This sustainability statement is divided into three parts:

- Planning Policies;
- Sustainability Measures;
- Sustainability Standards.

The first part provides an overview of the site and planning policies applicable to this development in accordance with the London Plan and relevant Camden Core Strategy policies.

The second part then outlines the sustainability strategy that has been employed to address the relevant planning policies.

The third part of this report outlines the sustainability measures that have been adopted to achieve a BREEAM Refurbishment 'Good' rating. As the policy target for Camden is to achieve BREEAM 'Excellent', the scheme has gone through a comprehensive assessment of issues deemed feasible for this Grade II Listed building within the Bloomsbury Conservation Area. However, due to heritage and conservation considerations, the development is not deemed to be able to achieve the target policy rating. A summary of both feasible and unfeasible credits is detailed in the third part of this report, to demonstrate to the Local Authority that a BREEAM 'Good' is the maximum achievable rating in this case.

A summary of the pre-assessment credits for the BREEAM assessment are provided at the end of the BREEAM section.

The key sustainable design and construction measures incorporated in the proposals are summarised below, following the London Plan Sustainable Design and Construction SPG structure:

Effective Resource Management

- The re-use of previously under used land from a disused hostel into 7 dwellings;
- The refurbishment of Grade II Listed Buildings;
- The specification of water efficient fittings to limit water consumption to less than 105 litres per person per day;
- An ecological survey has been undertaken for the site, in order to identify any assets of ecological value that are to be retained.

Adaptation to Climate Change

- The inclusion of cycle storage for dwellings to encourage the use of sustainable, low carbon travel;
- The inclusion of passive design measures to mitigate the risk of overheating;
- The space heating and hot water will be provided through high efficiency gas boilers. All heat sources and pipe work will be sufficiently insulated to avoid excess heat loss into internal space.

Pollution Management

- Effective pollution management and control: the development is not expected to have any significant adverse effects to air, noise, land or watercourses.

In summary, the proposed development at 3–7 Frederick Street satisfactorily addresses the targets set out by Camden's Core Strategy and The London Plan. The pre-assessment carried out for the scheme demonstrates that a maximum BREEAM score of 52.59% and BREEAM 'Good' rating could be achieved.

The number of credits obtained in the BREEAM pre-assessment and sustainability measures incorporated reflect the client and design team's aspirations in integrating sustainability measures and demonstrates that the project is designed to address the planning policy sustainability requirements.

SITE

The proposed residential development is located the London Borough Camden. This section presents the description of the site and of the development proposal.

The proposed development includes the restoration of 3 Grade II listed townhouses. The proposal includes a change of use from a hostel into 7 dwellings. The new scheme includes three 2-storey, one 3-storey apartments and three 1-storey dwellings. The site's main access is from Frederick Street and it is located approximately 1.5 miles from Kings Cross Station.

The approximate location and boundary of the application site is shown in the figure below.

Figure 1: Proposed site location

PLANNING POLICY

The 3–7 Frederick Street development has been designed in line with the requirements set out by Camden's Core Strategy as well as the London Plan[1].

The relevant planning policy documents for sustainability are:

- The London Plan (2016);
- Emerging London Plan 2018;
- Camden's Council Core Strategy;
- Sustainable Design and Construction SPG (2014);
- Housing Supplementary Planning Guidance (2016).

THE LONDON PLAN

The London Plan is the overall strategic plan for London, setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20–25 years.

The overarching policy setting out the principles of sustainable design and construction to be incorporated in major proposals is Policy 5.3:

POLICY 5.3 SUSTAINABLE DESIGN AND CONSTRUCTION

"Planning decisions:
B. 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.
C. Major development proposals should meet the minimum standards outlined in the Mayor's supplementary planning guidance and this should be clearly demonstrated within a design and access statement. The standards include measures to achieve other policies in this Plan and the following sustainable design principles:

a. minimising carbon dioxide emissions across the site, including the building and services (such as heating and cooling systems)
b. avoiding internal overheating and contributing to the urban heat island effect
c. efficient use of natural resources (including water), including making the most of natural systems both within and around buildings
d. minimising pollution (including noise, air and urban runoff)
e. minimising the generation of waste and maximising reuse or recycling
f. avoiding impacts from natural hazards (including flooding)
g. ensuring developments are comfortable and secure for users, including avoiding the creation of adverse local climatic conditions
h. securing sustainable procurement of materials, using local supplies where feasible, and
i. promoting and protecting biodiversity and green infrastructure."

Complementary to, and expanding upon Policy 5.3 are the following London Plan policies:

- Policy 5.2 Minimising Carbon Dioxide Emissions
- Policy 5.5 Decentralised Energy Networks
- Policy 5.6 Decentralised Energy in Development proposals
- Policy 5.7 Renewable Energy
- Policy 5.9 Overheating and Cooling
- Policy 5.11 Green Roofs and Development Site Environs
- Policy 5.12 Flood Risk Management
- Policy 5.13 Sustainable Drainage
- Policy 5.15 Water use and Supplies

[1] The London Plan, Further Alterations to the London Plan (March 2015) and Housing Standards Minor Alterations to the London Plan (March 2016), herein referred to as The London Plan

- Policy 5.18 Construction, Excavation and Demolition Waste.

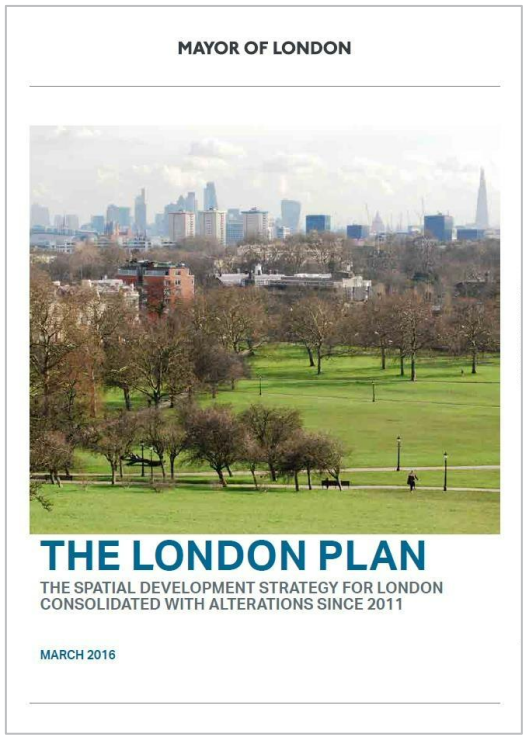
Specific requirements on the use of energy and water resources, applicable to all major proposals, are as follows.

POLICY 5.2 MINIMISING CARBON DIOXIDE EMISSIONS

"...Major developments [must] meet the following targets for carbon dioxide emissions reduction in buildings. These targets are expressed as minimum improvements over the Target Emission Rate (TER) outlined in the national Building Regulations leading to zero carbon residential buildings from 2016 and zero carbon non-domestic buildings from 2019."

POLICY 5.15 WATER USE AND SUPPLIES

"...setting an upper limit of daily domestic water consumption to 105 litres/head for residential developments (excluding a maximum allowance of 5 litres/head/day for external water consumption)."



EMERGING LONDON PLAN 2018

The current 2016 consolidation Plan is still the adopted Development Plan. However, the Draft London Plan is a material consideration in planning decisions. The New London Plan is scheduled to be published in autumn 2019.

The following paragraphs highlight the key changes and additional requirements stemming from emerging policies.

GREENHOUSE GAS EMISSIONS

Policy GG6 (Increasing efficiency and resilience) sets a positive direction for the new draft Plan in terms of ambitious new greenhouse gas emission targets. This policy references London's target to become zero carbon by 2050 and the need to design buildings and infrastructure for a changing climate. To drive this change both residential and non-residential schemes will need to be net zero-carbon (via offset payments). At least 35% of this reduction must be made on site, with residential developments expected to achieve at least a 10% (and non-residential at least a 15%) reduction in emissions through energy efficiency measures alone.

In a major departure from the previous London Plan, calculations will be required to include both regulated and unregulated emissions at each stage of the energy hierarchy. Furthermore, major developments will have to submit details of the method with energy performance and carbon dioxide emissions monitored post-construction for at least the first five years of building operation.

ENERGY INFRASTRUCTURE

In addition to upgrades to the lean and green stages of the energy hierarchy the clean stage has also been enhanced. Most notably, all major developments within Heat Network Priority Areas will need to utilise a communal heating system.

For the first time in UK policy this policy (SE3: Energy infrastructure) recommends fuel cell technology, as step on the heating hierarchy, for selecting communal heating systems. Where developments are utilising CHP this policy also requires them to demonstrate that 'the emissions relating to energy generation will be equivalent or lower than those of an ultra-low NOx gas boiler'.

MATERIALS, WASTE & EMBODIED CARBON

A requirement for Energy Strategies to include proposals to minimise the embodied carbon in construction will be made. This may result in more sustainable material choices at design stage and could lead to straw, bamboo, clay and recycled materials alongside the more widely recognised cross-laminated timber becoming more commonplace in the capital. This section also links with Policy SI7: Reducing waste and supporting the circular economy, whereby materials are retained in use at their highest value for as long as possible. All referable applications will be required to submit a Circular Economy Statement.

AIR QUALITY

The new draft Plan addresses this crucial area by requiring all proposals to utilise 'design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems with air quality.'

In practice this will mean that a preliminary Air Quality Assessment (AQA) will need to be carried out for all major developments prior to any design work taking place, with a full AQA submitted in support of the planning application; these pieces of green infrastructure will also contribute towards the new draft Plan's target to make at least 50% green by 2050.

It should be noted that, as the policies in the draft London Plan are not yet adopted, the following sections demonstrate compliance with the current plan.

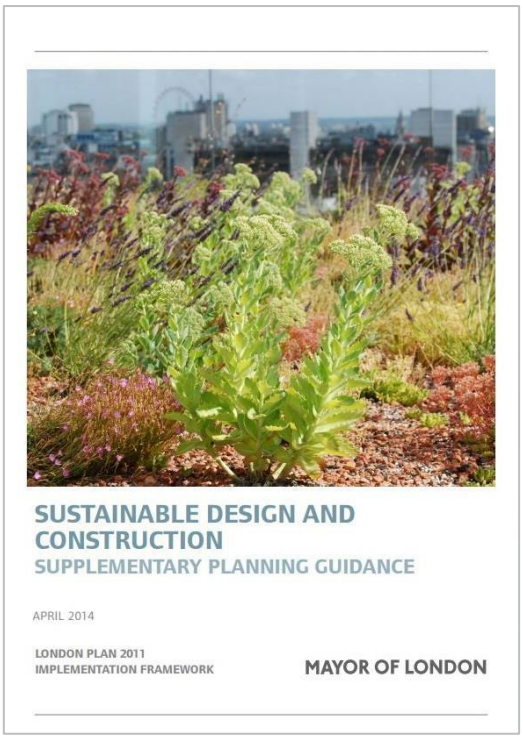
SUSTAINABLE DESIGN AND CONSTRUCTION SPG

The Sustainable Design and Construction SPG, adopted in April 2014, provides additional information and guidance to support the implementation of the Mayor's London Plan. The SPG does not set new policy, but explains how policies in the London Plan should be carried through into action.

It is applicable to all major developments and building uses so it is not technically applicable to this development, however in line with the developer's intention to implement the requirements of the London Plan it has been used to guide the design. It covers the following areas:

- Resource Management
- Adapting to Climate Change and Greening the City
- Pollution Management

This SPG provides a basis for sustainable design in London and is used as the overarching structure of this report. Where additional local policies are addressed by these areas this has also been indicated.

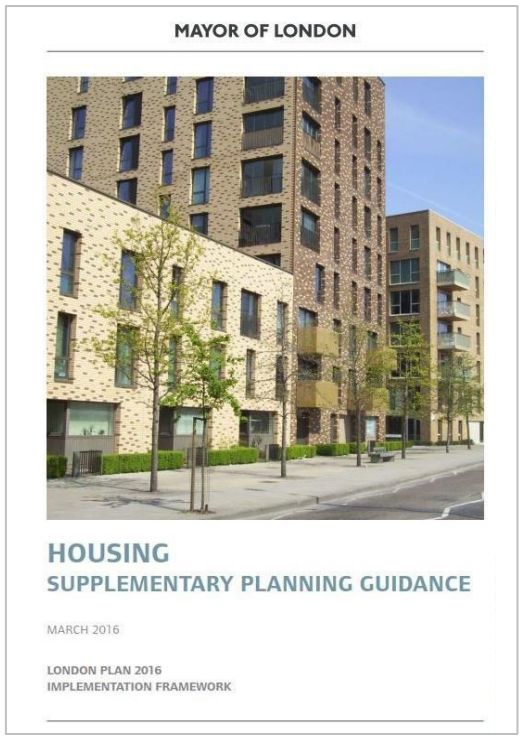


HOUSING SPG

This document provides guidance on the implementation of housing policies in the London Plan and it replaces the 2012 Housing SPG.

Part 2 covers housing quality and updates London housing standards to reflect the implementation of the government's new national technical standards through the Minor Alterations to the London Plan (2015-2016).

As design affects the quality of life, health & wellbeing, safety and security of users and neighbours, this guidance is integral to sustainable development and will be cross-referenced as relevant in the subsequent sections.



CAMDEN LOCAL PLAN

Camden aims to tackle the causes of climate change in the borough by ensuring developments use less energy and assess the feasibility of decentralised energy and renewable energy technologies.

POLICY CC1: CLIMATE CHANGE MITIGATION

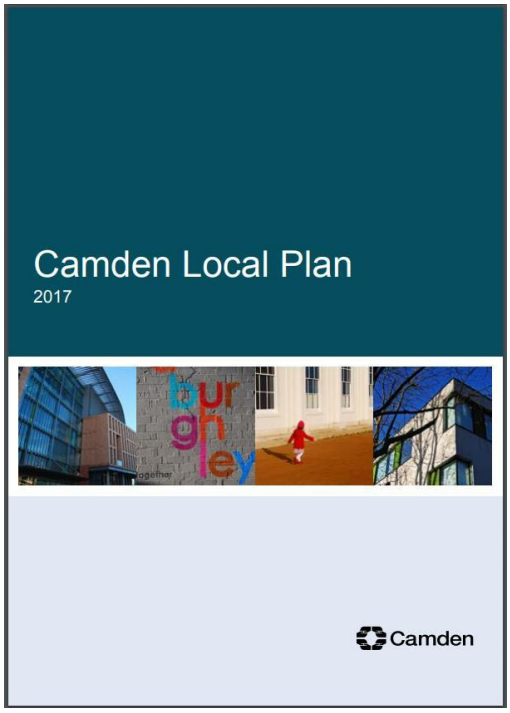
The council will require all development to minimise the effects of climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation.

- Promote zero carbon development and require all development to reduce carbon dioxide emissions through following the steps in the energy hierarchy
- Ensure that the location of the development and mix of land uses minimise the need to travel by car and help to support decentralised energy networks
- Support and encourage sensitive energy efficiency improvements to existing buildings
- Protecting existing decentralised energy networks and safeguarding potential network routes

POLICY CC2: ADAPTING TO CLIMATE CHANGE

All developments should adopt appropriate climate change adaption measures such as;

- The protection of existing green spaces and promoting new appropriate green infrastructure
- Not increasing, and wherever possible reducing, surface water run off through increasing permeable surfaces and the us Sustainable Drainage Systems
- Measures to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy



POLICY CC3: WATER AND FLOODING

The development cannot increase flood risk and must reduce the risk of flooding where possible.

The development must;

- Incorporate water efficiency measures;
- Avoid harm to the water environment and improve water quality
- Consider the impact of development in areas at risk of flooding
- Incorporate flood resilient measures in areas prone to flooding

POLICY CC4: AIR QUALITY

The council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality.

POLICY CC5: WASTE

Developments must include facilities for the storage and collection of waste and recycling.

RESPONSE TO PLANNING POLICIES

This part of the report presents how the development complies with sustainable development policies and incorporates guidance on sustainable design and construction. The following sections are structured around the London Plan's Sustainable Design and Construction SPG and present the key elements of the proposal that underpin environmental sustainability

RESOURCE MANAGEMENT

1. LAND

Land Use

The land for this proposal is used efficiently as the scheme includes the restoration of a Grade II Listed Building. The 3 townhouses were previously used as a hostel.

Impacts on Neighbours from Demolition and Construction

The Considerate Constructors Scheme will be used to ensure that contractors carry out their operations in a safe and considerate manner.

Construction impacts (e.g. dust generation) shall be minimised through adoption of best practice construction measures, formalised through the production of a Construction and Environmental Management Plan.

Surface Water Flooding

The development is designed with a view to minimising adverse impacts on surrounding water courses and to reduce the risks associated with surface water flooding. The proposal does not incorporate a decrease in permeable ground, therefore the risk of flooding will not be increased as a result of the refurbishment proposals.

Biodiversity

An ecological survey has been undertaken for the site, in order to identify any assets of ecological value that are to be retained. The site is deemed of low ecological value due to its lack of ecological features and previous use as a hostel. No further damage will be caused to the site as a result of the restoration.

2. SITE LAYOUT & BUILDING DESIGN

Reuse of Existing Buildings

The proposal utilises and enhances the existing building whilst not detracting from the Grade II Listed heritage.

Site Layout

Consideration has been given to the layout and scale of the surrounding buildings and within the Bloomsbury Conservation Area. The massing and façade of the building will remain the same, following a principle of densification whilst not changing the overall scale and historical scene of the area. Additionally, the updated layout has been arranged to ensure primary habitable rooms have a pleasant outlook and where possible, receive direct sunlight.

Daylight & Sunlight

Amenity areas for the residents of the flats will be provided in back gardens which are south facing so light and sunlight will be available.

The scheme will have no adverse effects on access to daylight and sunlight of neighbouring properties as the massing has not been extended from the current scale.

Micro-climate

A microclimate is the distinctive climate of a small-scale area and the variables within it, such as temperature, rainfall, wind or humidity may be subtly different to the conditions prevailing over the area as a while. The main characteristics of microclimates within London are temperatures and wind.

The proposed scheme does not change the overall massing and is not of a scale that could potentially have any significant impact on wind conditions around the site or any adverse effects on pedestrian and residents' comfort.

3. ENERGY & CARBON DIOXIDE EMISSIONS

The Energy Strategy for the development has been designed in line with the London Plan's Policy 5.2, which states that every effort should be made to minimise carbon dioxide emissions in accordance with the following energy hierarchy:

1. Be lean: use less energy
2. Be clean: supply energy efficiently
3. Be green: use renewable energy

Be Lean

The buildings have been thoughtfully designed to reduce energy demand through enhancing the building fabric, reducing reliance on artificial lighting, utilising low energy lighting and ensuring adequate levels of ventilation are maintained.

Be Clean

As discussed in detail in the Energy Statement, the size and location of this development does not lend itself to incorporation into an existing heat network. Refer to the supplementary Energy Statement for further details on these sections.

4. RENEWABLE ENERGY (BE GREEN)

A range of renewable technologies were considered for generating on-site renewable energy. No renewable technologies were deemed suitable for this development due to the harm they would pose to the historic façade of the building and the area as a whole.

5. WATER EFFICIENCY

The development at 3–7 Frederick Street aims to reduce water consumption to less than 105 litres per person per day, in line with the recommended target set out in the Housing SPG, through the use of water efficient fittings, and these are listed below.

Table 1: Recommended specification for sanitary fittings

Fitting	Fitting specification
WC	6/3 litres dual flush
Kitchen sink tap	6 litres per min
Wash basin tap	4 litres per min
Shower	8 litres per min
Bath	180 litres
Washing machine	8.17 litres/kg
Dishwasher	1.25 litres/place setting

6. MATERIALS AND WASTE

More than three of the key elements of the buildings' envelope will achieve a rating of A+ to C in the BRE's The Green Guide.

In addition, 100% of the timber used will be sourced from accredited Forest Stewardship Council (FSC) or Programme for the Endorsement of forestry Certification (PEFC) source.

Products holding responsible sourcing certification (EMS/ISO14001 for the key process as per minimum) will be specified for the main building elements (walls, floors, roof).

7. NATURE CONSERVATION & BIODIVERSITY

The land on site is deemed to have low ecological value and therefore species will not be adversely affected by the refurbishment.

The ecology on site will be improved via the maintenance of landscaped areas within the proposed private gardens to the south of the site. The intended planting strategy for these areas is simple low-level flora, with hedge planting and small ornamental trees.

ADAPTING TO CLIMATE CHANGE AND GREENING THE CITY

1. TACKLING INCREASED TEMPERATURE AND DROUGHT

The potential risk of overheating will be mitigated by incorporating passive and active design measures.

Minimising internal heat generation through energy efficient design

The space heating and hot water will be provided through high efficiency gas boilers. All heat sources and pipe work will be sufficiently insulated to avoid excess heat loss into internal space.

Efficient lighting will be used to further minimise internal heat gains and reduce energy expenditure.

Reducing the amount of heat entering the buildings in summer

All ample existing windows will be retained, helping maintain comfortable indoor temperatures and offering natural ventilation. Glazing with low transmittance will be used in the new windows to reduce solar gains.

Passive ventilation

The dwellings have allowed for passive ventilation as the primary strategy for providing fresh air and dissipating heat.

3. FLOODING

The site is located in an area of low risk to flooding. Additionally, the area of permeable ground will remain consistent with the existing site.

POLLUTION MANAGEMENT – LAND, AIR, NOISE, LIGHT AND WATER

1. LAND CONTAMINATION

Although there is no excavation or major demolition, in the event of any discovery of potentially contaminated soils or materials, this discovery will be quarantined

and reported to the most senior member of site staff or the designated responsible person at the site for action. The location, type and quantity will be recorded and the Local Authority, a competent and appropriate third-party Engineer/Environmental consultant notified immediately. An approval from the Local authority will be sought prior to implementing any proposed mitigation action.

2. AIR POLLUTION

Air pollution risks from construction and demolition activities on site will be minimal and in line with the SPG 'The control of dust and emissions from construction and demolition' under the following categories:

- demolition;
- earthworks;
- construction;
- trackout; and,
- non-road mobile machinery (NRMM).

During the operational phase of the development, combustion of fossil fuels and associated combustion emissions for heating will be reduced via improvements to levels of insulation of the buildings' external fabric, and the specification of highly efficient gas boilers (for further details please refer to the accompanying Energy Statement).

Ultra-low NOx boilers (maximum NO_x emissions of under 40mg/kWh dry NO_x at 0% excess O_2) will be specified to further reduce impacts on air quality from the combustion of fuels on site.

To protect internal air quality, 'healthy' materials will be specified for the buildings' fabric and internal finishes, where feasible; these will be non-toxic, and low emitters of VOCs and formaldehyde.

In order to underpin the reduction of emissions from transport, the development has been designed to encourage cycling; cycle parking will be provided to all flats, apartments and maisonettes.

Overall, the development will not have a negative effect on existing local air quality levels.

3. NOISE

The development will incorporate design and building fabric measures to mitigate potential noise levels from the proposed development, and ensure the impact of any external sources on internal ambient noise levels are within acceptable limits.

4. LIGHT POLLUTION

The lighting design of the proposed development will follow the recommendations of the Institution of Lighting Engineers' Guidance Notes for the Reduction of Obtrusive Light (2005), to minimise light pollution. Further mitigation measures will be implemented to ensure disturbance to wildlife is minimal.

5. WATER POLLUTION

Water pollution to surrounding watercourses will not be increased as there will not be an increase in impermeable areas as a result of the development.

In addition, contractors will adopt best practice policies to mitigate water pollution from construction activities on site.

The development will discharge domestic sewage via a connection to the public foul sewer or combined sewer network where it is reasonable to do so.

SUSTAINABILITY STANDARDS

Within the Camden Core Strategy, the BREEAM standard of 'Excellent' is required for all non-residential developments. The following Pre-Assessment demonstrates that although the number of credits required for this rating can be met, the BREEAM score is capped at 'Good' due to mandatory minimum requirements.

BREEAM REFURBISHMENT AND FIT-OUT 2014

BREEAM Non-Domestic Refurbishment and Fit-Out (2014) is a performance based environmental assessment method and certification scheme for refurbished buildings or those undergoing fit-out.

The primary aim of BREEAM is to mitigate the impacts of developments on the environment over the entire life-cycle of the building in a comprehensive and cost-effective manner. This is achieved through the integration of the BREEAM scheme at key stages of the design and procurement process.

A BREEAM Non-Domestic Refurbishment and Fit-Out Pre-Assessment was carried out for the Commercial element of the development. The pre-assessment tool uses established benchmarks to evaluate a building's specification, design, construction and operation, over a broad range of categories and criteria:

- Management processes
- Health and wellbeing
- Energy use
- Transport
- Water use
- Materials
- Waste
- Land use and ecology
- Pollution

The outcome of the pre-assessment is expressed as a single certified BREEAM rating, ranging from Pass (30%) to Outstanding (85%).

Table 2: BREEAM Certification Thresholds

BREEAM 2014 Rating	Percentage of Credits Required
Outstanding	85%
Excellent	70%
Very Good	55%
Good	45%
Pass	30%

The following section discusses how the development addresses the BREEAM sustainability criteria. Each of the categories as set out in BREEAM are addressed; and each sub-section highlights the sustainability measures that have been adopted to meet BREEAM 'Good' and any issues that are considered to be infeasible to be adopted due to design, location or heritage concerns.

MANAGEMENT

MAN01 Home User Guide

A 'Home User Guide' will be made available to all dwellings, providing occupants with an understanding of the energy associated with the operation of their home. This non-technical guide will include operational instructions, recommendations on improving energy use and information on the surrounding area (local amenities) to obtain full credits in this section.

MAN03 Construction Site Impacts

To minimise the construction impacts of the site, contractors will be required to monitor, report and set targets for the reduction of CO_2 arising from site activities in respect to energy, water and materials.

MAN04 Security

All new and replacement external doors and windows will meet minimum security standards and be appropriately certified.

MAN05 Protection and Enhancement of Ecological Features

An ecological survey will be carried out to confirm the presence of ecological features. As the site only includes the existing building itself, the site is likely to be considered to have limited features of ecological value. However, all of the recommendations and observations made by the ecological survey will be implemented and followed.

MAN06 Project Management

All of the project team has been involved in the project decision-making and individual and shared roles and responsibilities have been assigned by the project manager across the following key design and refurbishment stages:

- Planning and Building control notification
- Design
- Refurbishment
- Commissioning and handover
- Occupation

Key design team meetings will be held to define and make key decisions that influence or affect the dwellings' proposed designs, and their refurbishment in accordance with the design (and therefore the dwellings' sustainability impacts and BREEAM performance).

HEALTH AND WELLBEING

HEA01 Daylighting

The refurbishment is not expected to have a negative impact on daylighting. Glazing currently makes up a large area of the existing building consistent with the typical style from this era with grand proportions and heightened sense of space and light. The later addition of modern rooflights provides light to the top floors of the dwellings where room layouts have changed and glazing areas are typically smaller.

HEA02 Sound Insulation

The airborne sound insulation and impact sound insulation values will be no worse than those determined pre refurbishment.

HEA03 Volatile Organic Compounds

All decorative paints and varnishes used in the refurbishment will meet the relevant credit requirements, to ensure the occupants will enjoy healthy indoor spaces.

HEA05 Ventilation

The minimum ventilation levels set out in Sections 7 of Building Regulations Approved Document Part F will be provided for all habitable rooms, kitchens, utility rooms and bathrooms.

HEA06 Safety

Fire and carbon monoxide detection systems will be installed as part of the refurbishment and extension. A compliant fire detection and alarm system will also be provided.

ENERGY

ENE01 Improvement in Energy Efficiency Rating (EER)

The Energy Efficiency Rating (EER) is a measure of the overall efficiency of a dwelling. It accounts for regulated energy use in terms of heating, hot water, equipment, lighting and auxiliary energy use.

The methodology set out by the Department of Energy and Climate Change (DECC) for assessing the energy use of dwellings is the Standard Assessment Procedure (SAP). The current version of software is FSAP 2012.

Preliminary SAP calculations were carried out to assess the potential CO_2 savings achieved through energy efficiency measures.

The preliminary SAP calculation for the proposed development at 3–7 Frederick showed considerable reductions in energy demand in comparison to the existing building. The SAP calculation results indicate that the EER will increase by an average of 13 or 24% for the refurbished dwellings.

ENE02 Energy Efficiency Rating (EER) Post Refurbishment

Reduction in energy demand of the proposed dwellings will be achieved through the addition of internal insulation in the roof and ground floor of the dwellings. Any improvements to the building fabric that can be contained internally have been considered and implemented in order to improve the building's performance. As well as internal improvements, heritage sash windows have been secondary glazed and casement windows double glazed.

The use of energy efficient lighting has been specified throughout the dwellings as well as the installation of energy efficient space heating and hot water systems.

ENE03 Primary Energy Demand

An average primary energy demand of less than 300 kWh/m^2/year will be achieved after refurbishment works are carried out for the development at 3–7 Frederick Street.

ENE05 Energy Labelled White Goods

White goods are not provided with the scheme however the EU Energy Efficient Labelling scheme information will be provided in a leaflet to each dwelling.

ENE06 Drying Space

The proposed refurbishment will include provisions for clothes drying, thereby reducing the amount of electricity consumed through the use of tumble dryers. The development will include at least 4m of drying lines in 1-2 bedroom dwellings and at least 6m in 3+ bedroom dwellings.

ENE07 Lighting

Energy efficient light fittings will be installed in all external spaces. Existing external lighting will also meet the compliance requirements.

In addition, external lights will be fitted with controls to reduce the energy consumption of the building during periods of infrequent use:

- external space lighting will include energy;
- efficient fittings;
- security lighting will include daylight cut-off devices, with a maximum wattage of 150W; and
- PIR.

Internal lighting will have a maximum average wattage across the total floor area of 9 watts/m^2.

ENE08 Energy Display Devices

Energy display devices will be installed in all dwellings to enable occupants to gain an understanding of their energy consumption and to enable them to reduce their energy use in the future.

The display devices will provide information on current electricity and primary heating consumption data and will be capable of recording consumption data.

ENE10 Home Office

Each proposed dwelling will allow for a home office space in an appropriate room comprising:

- sufficient space for a chair, desk and bookshelf
- adequate ventilation
- 2 No. double power sockets and
- 2 No. telephone sockets (or one telephone
- socket where broadband is provided)

WATER

WAT01 Internal Water Use

The water category aims to reduce the consumption of potable water in the home from all sources. These are mandatory credits within BREEAM Domestic Refurbishment, with BREEAM 'Excellent' setting an upper limit of 107 litres per person per day.

The proposed development aims to reduce water consumption through the use of water efficient fittings, including dual flush toilet, water efficient shower heads and taps.

It is estimated that the proposed refurbishment and extension will achieve a water consumption rate of less than 105 litres/person/day, exceeding the minimum requirement for BREEAM Domestic Refurbishment 'Excellent' and meeting the London Plan's requirements.

WAT01 External Water Use

A water butt connected to the rainwater downpipes with an automatic overflow will be provided with a tap.

WAT03 Water meter

A water meter providing visual display of mains potable water consumption will be installed at a secure and visible location within the dwellings.

The water meters will be capable of recording and displaying historical water consumption, and allowing occupants to monitor their water consumption over time. The meter will also be able to display current consumption either instantaneously or at half hourly intervals.

MATERIALS

MAT01 Environmental Impact of Materials

Embodied energy is the energy that is used in the manufacture, processing and the transportation of the materials to site.

The construction build-ups for each of the main building elements are rated from A+ to E. Each element to be used in the building has been rated according to the BRE Green Guide to Specification whereby:

- A+ rated elements are least likely to affect the environment
- E rated elements are most likely to affect the environment

New materials added to existing main building elements within this development will achieve between an A+ to C rating as far as practically possible.

MAT02 & MAT03 Responsible Sourcing of Materials and Insulation

The principal contractor will source materials in accordance with a documented sustainable procurement plan and at least 30% of the materials specified will be obtained from responsible sources.

This includes all basic building elements, comprising the building frame, floors, roof, external walls, foundations and internal walls and all finishing elements.

In addition, 100% of all timber used on site will be legally sourced, thereby satisfying the mandatory requirements set out in this category. Any timber used in the structural and finishing elements will be specified from certified sustainable sources such as FSC or PEFC.

Where possible, on-site materials will be reused and recycled to lower transport CO_2 emissions associated with off-site recycling. Where practicable, materials with a high recycled or waste content will be specified.

The insulation index for all new insulation used in external walls, floors, roof and building services will be more than 2 when calculated using the BREEAM Mat3 Insulation Calculator.

WASTE

WAS01 Household Waste

A Local Authority Collection Scheme will be in operation for the collection of mixed recyclable household waste, at least 30 litres of storage space for recycling will be provided internally at a dedicated position in the kitchen.

WAS02 Construction Site Waste Management

The development will minimise the impact of construction waste on the environment through a Level 1 Site Waste Management Plan (SWMP). This plan will include:

- benchmarks for resource efficiency
- procedures and commitments to reduce
- hazardous and non-hazardous waste
- monitoring hazardous and non-hazardous
- waste

The amount of waste generated will be recorded in the SWMP, and the volume of non-hazardous construction waste generated from the development will meet or exceed the target resource efficiency benchmark. If demolition is included as part of the refurbishment programme, then the audit should also cover demolition materials. In addition, pre-refurbishment audit of the existing building will be completed prior to works commencing on site.

POLLUTION

POL01 NOx Emissions

This section aims to reduce the release of nitrogen oxide (NOx) into the atmosphere. Space heating and hot water requirements of the dwellings will be met by a centralised CHP system with high efficiency gas boiler backup and low inherent NOx emissions. Gas boilers and CHP with NOx emissions of less than 40 mg/kWh will be specified.

POL02 Surface Water Runoff

The site's impermeable areas will remain unchanged following the refurbishment, therefore there will be a neutral impact on surface water.

POL03 Flooding

The Environment Agency flood map shows the site to be at low risk of flooding.

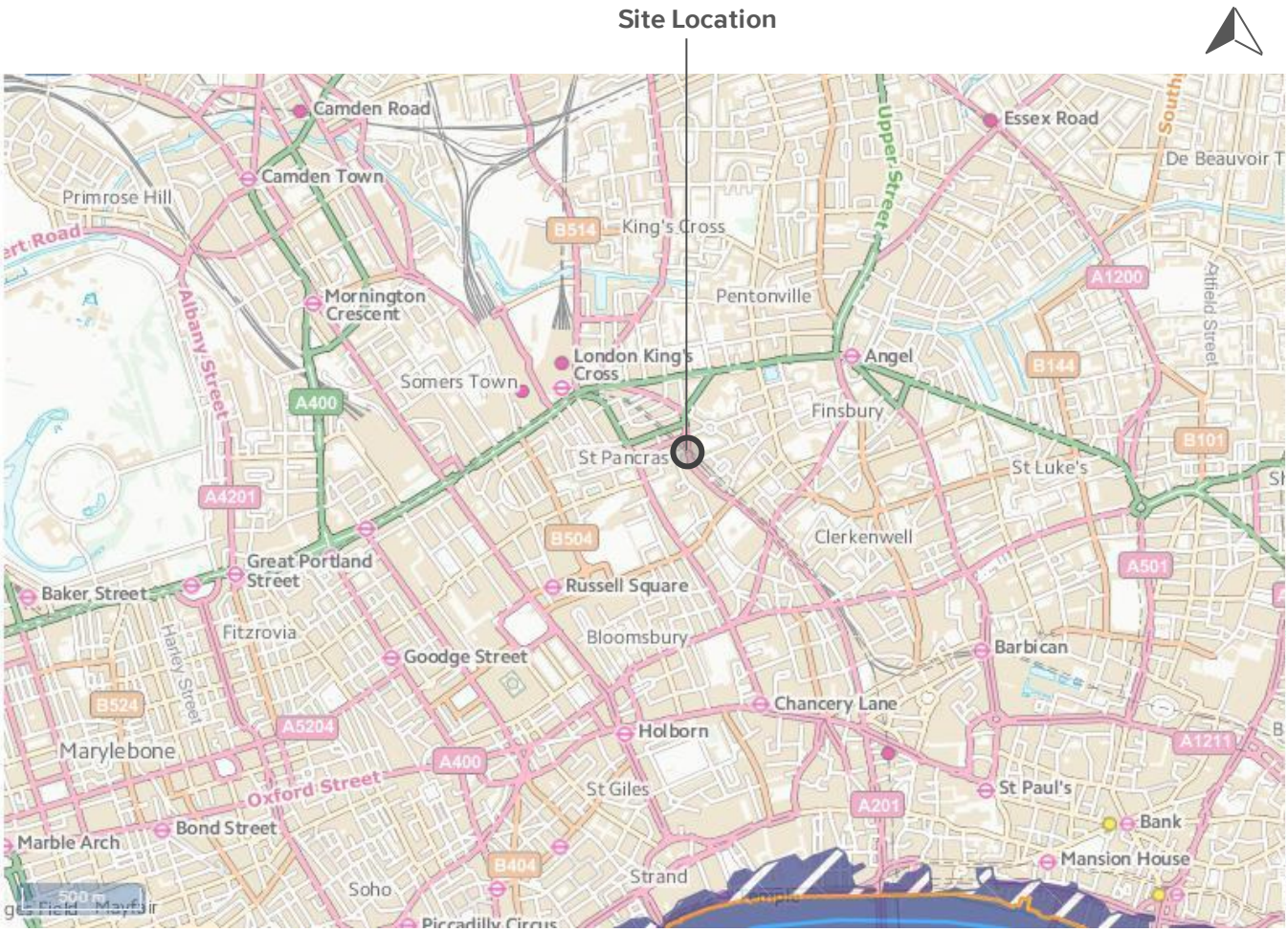


Figure 2 Environment Agency Flood Risk Map

ANALYSIS OF CREDITS LOST

The proposed development at 3-7 Frederick Street incorporates a number of appropriate sustainability measures, as detailed in the previous section. Despite these efforts, there still are a number of issues, including minimum rating requirements, that would prevent the development from achieving a rating higher than 'Good'. This is due to the existing buildings Grade II Listed Building status and location within the Bloomsbury Conservation Area. The following section details all critical credits deemed unattainable due to unacceptable impacts to the existing building characteristics, as evidenced by correspondence with Camden's Conservation Officer which can be found in Appendix A.

MAN02 Responsible Construction Practices

There is insufficient space on site the provide site health and welfare facilities that would satisfy the Considerate Contractors Scheme. The front road of the property is a designed cycle route and it is unlikely that the Council would permit extensive site accommodation to be located in the street.

MAN06 Project Management

A thermographic survey and air permeability test both pre and post refurbishment would not bring value to the development as both air tightness and thermal bridges cannot be significantly improved as most of the building fabric is protected by the Grade II Listing.

HEA05 Inclusive Design

Minimum accessibility credits cannot be awarded in this scheme as the entrance from the street to the dwellings does not meet advanced accessibility criteria. Any changes to improve and enhance accessibility will negatively impact the aesthetic of the building.

ENE02 Energy Efficiency Rating (EER) Post Refurbishment

Reduction in energy demand of the proposed dwellings has been driven as far as practically possible in view of the constraints posed by the listed status of the building, and will be achieved through the following measures:

- Additional basement floor insulation to achieve 0.25W/m^{2}K;
- Cold roofs to be insulated between and over ceiling joists to achieve 0.16W/m^{2}K;
- Pitched roofs insulated between rafters to achieve 0.18W/m^{2}K;
- Dormers to be insulated to achieve 0.21W/m^{2}K;
- New conservation rooflights to achieve 1.4W/m^{2}K;
- Existing and new dormer windows to receive secondary glazing to achieve 2.6-2.9W/m^{2}K;
- New and replacement external doors to be double glazed and draught stripped to achieve 1.8W/m^{2}K;
- Replacement casement windows to achieve 1.8W/m^{2}K; and
- Specification of energy efficient lighting and new energy efficient space heating and hot water systems.

SAP calculations show that an average EER of 64 will be achieved for the dwellings at 3–7 Frederick Street. Considering the internal building fabric improvements and internal energy efficient fittings and services, the building's energy performance cannot be feasibly pushed further without negatively affecting its listed characteristics, which would bring unacceptable impacts and contract Local Polices. Due to this, we consider that the current energy performance of the flats is the maximum attainable when considering the constraints of the development.

A minimum EER rating of 65 is required for all developments to achieve a 'Very Good' rating. As the average EER rating of the development is below the minimum requirement, although the development exceeds the number of credits for this rating the maximum rating achievable will be 'Good'.

ENE04 Renewable Technologies

Whilst internal elements of the scheme can be improved to enhance the building's energy performance, external additions would compromise the historic aesthetic and have been not supported by the Conservation Officer.

ENE09 Cycle Storage

At least 1 cycle storage space will be provided per dwelling for the refurbished building. This is to reduce the frequency of short car journeys. However, this

credit is not achievable due to not meeting the stringent BREEAM spacing requirements.

BREEAM PRE-ASSESSMENT RESULTS

A BREEAM pre-assessment has been undertaken at pre-application stage which has shown that a score of 52.59% is feasible.

The results for the pre-assessment are summarised in the table below, and include a breakdown of the currently targeted score for each issue and category.

Table 3: BREEAM Pre-Assessment Breakdown

BREEAM Category	Total Credits Available	Score Assessment		
		Sub-total	Weighting	Score (%)
Management	11	7	12%	7.64%
Health & Wellbeing	12	6	17%	7.08%
Energy	29	13	43%	19.28%
Water	5	3.5	11%	7.70%
Materials	48	24	8%	4.0%
Waste	5	4	3%	2.40%
Pollution	8	6	6%	4.50%
BREEAM Good		**Total Points Scored: 52.59%**		

CONCLUSION

The sustainability strategy for 3 –7 Frederick Street has been developed with the design team to comply with the relevant environmental policies from the London Borough of Camden and the London Plan. Relevant energy policies have been addressed in the accompanying Energy Statement. The proposed refurbishment is targeting the achievement of BREEAM 'Good' and expected to reduce on-site regulated carbon emissions by 25.7% over the existing Grade II Listed Building with SAP 2012 emission factors.

Sustainability measures have been adopted to meet the standards set out by The London Plan, The Greater London Authority and Camden's Local Plan. The refurbishment is set to achieve a BREEAM Refurbishment 'Good' rating. Although the target for Camden is BREEAM 'Excellent,' the scheme is restricted by the existing historic building fabric and heritage windows.

The key sustainable design and construction measures incorporated in the proposals are summarised below, following the London Plan Sustainable Design and Construction SPG structure:

Effective Resource Management

- The re-use of previously under used land from a hostel into 7 dwellings;
- The refurbishment of a Grade II listed buildings
- The specification of water efficient fittings to limit water consumption to less than 110 litres per person per day;
- An ecological survey has been undertaken for the site, in order to identify any assets of ecological value that are to be retained.

Adaptation to Climate Change

- The inclusion of cycle storage for dwellings to encourage the use of sustainable, low carbon travel;
- The inclusion of passive design measures to mitigate the risk of overheating
- The space heating and hot water will be provided through high efficiency gas boilers. All heat sources and pipe work will be sufficiently insulated to avoid excess heat loss into internal space.

Pollution Management

- Effective pollution management and control: the development is not expected to have any significant adverse effects to air, noise, land or watercourses.

The number of credits obtained in the BREEAM pre-assessment/sustainability measures incorporated reflect the client and design team's aspirations in integrating sustainability measures and demonstrates that the project is designed to exceed the planning policy sustainability requirements.

APPENDIX A

CORRESPONDENCE WITH CAMDEN'S CONSERVATION OFFICER

Harriet Hix

From: Laurel Nyberg <LaurelNyberg@boyerplanning.co.uk>
Sent: 28 June 2019 11:36
To: Harriet Hix
Cc: Billy Pattison; colinsears; Steve Gair
Subject: Fw: 3-7 Frederick Street 2019/1432/P

Hi Harriet,

Please see below from the conservation officer. I hope the below will be sufficient but please do let me know if you need more information.

Please could you also let me know how you are getting on in terms of timescales? We are hoping to have all application docs ready for One Housing to sign off next week. It would therefore be helpful to have your reports by Wednesday latest, so we can review and incorporate into out planning statement. Please let me know how this sounds?

Thank you,

kind regards,

Laurel

Laurel Nyberg BA (Hons) MSc
Planner

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Boyer

Southwark foodbank

Boyer's London office is proud to support Southwark Foodbank

From: Martin, Elizabeth <Elizabeth.Martin@camden.gov.uk>
Sent: 28 June 2019 11:30
To: Laurel Nyberg
Cc: Billy Pattison
Subject: RE: 3-7 Frederick Street 2019/1432/P

Dear Laurel,

Thank you for your email.

Having read through the possible interventions to improve energy performance, I can advise that, in my informal view, making those changes would likely result in unacceptable harm to the Grade II listed buildings and in the case of the windows and PV Panels, the wider conservation area as a whole. This harm would be contrary to Policies D1 and D2 in Camden's Local Plan and is unlikely to be supported.

I hope this feedback is useful. You will appreciate that this is an informal view based upon the information available to me and does not constitute a formal decision by the Council in the matter.

Kind Regards,

Elizabeth Martin
Senior Planner (Conservation)

Telephone: 0207 974 1204

From: Laurel Nyberg <LaurelNyberg@boyerplanning.co.uk>
Sent: 27 June 2019 17:34
To: Martin, Elizabeth <Elizabeth.Martin@camden.gov.uk>
Cc: Billy Pattison <BillyPattison@boyerplanning.co.uk>
Subject: 3-7 Frederick Street 2019/1432/P

Dear Elizabeth,

I hope you are well.

Many thanks for your pre-application comments, we have progressed the scheme and are looking to submit in the next couple of weeks.

Our energy consultant has been liaising with the sustainability officer in terms of discussing energy modelling and BREEAM for the scheme. At the moment, the score will be capped as 'good' due to not being implement the technologies and improvements to meet energy standards as to not cause undue impact on the listed properties. The sustainability officer is acceptable to this but wished for written confirmation from the conservation team that the current proposed improvements to the building fabric are as far as we can go in terms of ensuring no harm?

Specifically our consultant wanted to check the following could not be acceptable in terms of conservation:

- Further insulation in internal walls, roof and ground floor
- Updated windows
- Renewable technologies such as PV would not be feasible

I know this has been discussed during pre-app, but would be helpful if we could have an email from yourself confirming that such improvements are not acceptable, so this can be incorporated into the BREEAM pre-assessment to show that we have considered the energy strategy and can only achieve 'Good'.

Any queries at all, please do let me know.

Kind regards,

Laurel

Laurel Nyberg BA (Hons) MSc
Planner

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