



Sustainability Statement

44 Gloucester Avenue

For Victoria Square Property Company Limited

September 2015

XCO2 energy

w: www.xco2energy.com :: e: mail@xco2energy.com
t: +44 (0) 20 7700 1000 :: f: +44 (0) 20 7183 6620
17-18 Hayward's Place :: Clerkenwell :: London :: EC1R 0EQ

Contents

Executive Summary	3
Site	4
Planning Policies	5
Housing Standards Review	5
Camden Development Policies 2010	7
Camden Planning Guidance - Sustainability CPG3	8
- 2013	8
The London Plan 2015	9
Sustainability Standards	10
BREEAM Domestic Refurbishment Pre-Assessment	11
BREEAM Domestic Refurbishment Pre-Assessment Results	17
BREEAM Refurbishment and Fit-Out 2014	18
Proposed Sustainability Measures for New Build Dwellings	27

About us:

XCO2 Energy are a low-carbon consultancy working in the built environment. We are a multi-disciplinary company consisting of engineers, environmental experts and architects, with specialists including CIBSE low carbon consultants, Code for Sustainable Homes, EcoHomes and BREEAM assessors and LEED accredited professionals.

	Issue 01	Issue 02	Issue 03	Issue 04
Remarks	Draft			
Prepared by	MS	MS	SP	
Checked by	TS/SP	VG	KM	
Authorised by	RM	RM	RM	
Date	5/1/2015	30/1/2015	22/9/2015	
Project reference	8488	8_488	8_488	



Sustainability Statement

Executive Summary

This report outlines the sustainability strategy for the development at 44 Gloucester Avenue in line with the requirements set out by the London Plan and the London Borough of Camden.

This sustainability statement is divided into four parts:

- Sustainability Policies and Standards
- BREEAM Domestic Refurbishment
- BREEAM Refurbishment and Fit-Out
- Proposed Sustainability Measures for New Build Dwellings

The first part provides an overview of the site and planning policies applicable to this development as set out in the Camden Core Strategy and the London Plan 2015 (further alterations to the London Plan). The report then demonstrates how the policies have been met.

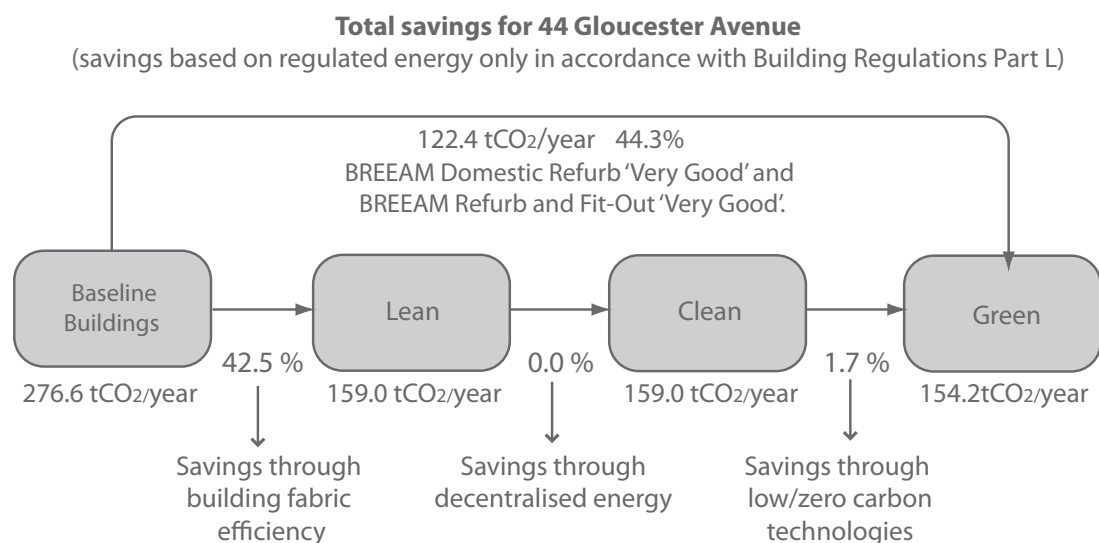
The body of this report outlines the sustainability measures that have been adopted, including BREEAM Domestic Refurbishment 'Very Good' and BREEAM Refurbishment and Fit-Out 'Very Good'.

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

The BREEAM Domestic Refurbishment dwellings, and the BREEAM Refurbishment and Fit-Out pre-assessment for the non-domestic spaces achieved 65.46 credits and 58.07 credits respectively, which both exceed the 55 credits required for BREEAM 'Very Good', but falls short of the BREEAM Excellent requirements set out in Camden Council's Development Policy and Sustainability Planning Guidance. Justifications for these are provided within the respective assessment sections for BREEAM Domestic Refurbishment and BREEAM Refurbishment and Fit-Out.

The diagram below provides a summary of the average CO₂ savings achieved by the proposed development in comparison to the baseline buildings. The savings over the baseline buildings amounts to 44.3% and reflects regulated energy use only, in accordance with Part L Building Regulations.

Further details can be found in the accompanying Energy Statement for the proposed scheme at 44 Gloucester Avenue.




Sustainability Statement

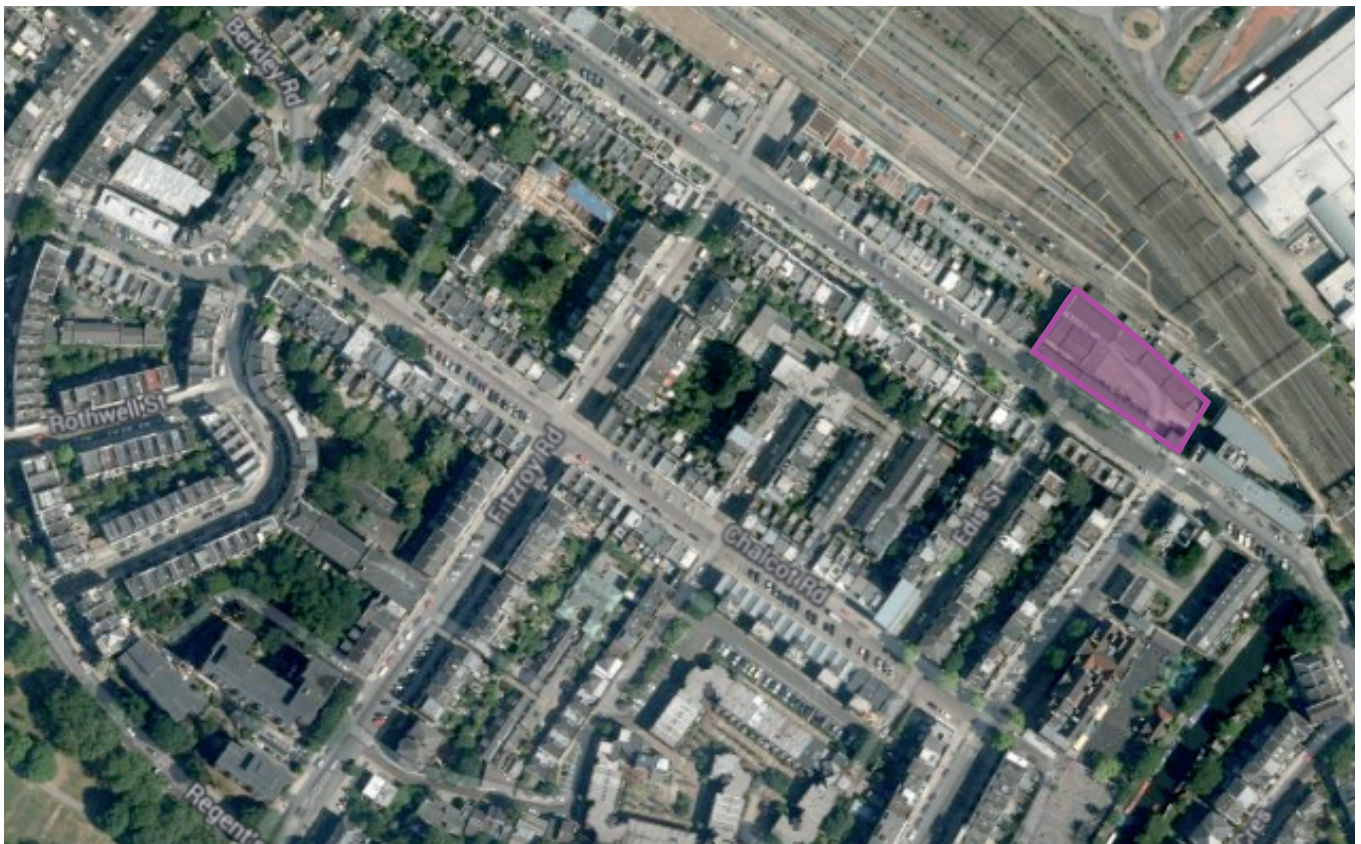
Site

The proposed development is located at 44 Gloucester Avenue. The junction with Princess Street is towards the South East end of the site and Edis Street lies opposite the main site access towards the south. The overground railway line lies to the north-east of the site. The development is located within the London Borough of Camden.

The proposed mixed-use development includes new and refurbished portions and will contain approximately 698 m² of commercial spaces and 40 no. 1,2 and 3 bedroom dwellings. The residential units consist of 22 new-build and 18 refurbished units.

The approximate location of the 44 Gloucester Avenue development is shown in the figure below.

 Approximate site location



Sustainability Statement

Planning Policies

The development has been designed in line with the requirements set out by the London Borough of Camden as well as the London Plan 2015 (further alterations to the London Plan).

The relevant planning policies for sustainability detailed in the current section are:

- Camden Core Strategy (2010)
- Camden Development Policies (DPD) (2010)
- Camden Planning Guidance (CPG3) (2013)
- London plan (2011)

Housing Standards Review

The government announced the conclusion to the Housing Standards Review on 27 March 2015. The review aimed to simplify government regulations and standards into one key set, driven by Building Regulations.

As an outcome from the Deregulation Bill (2015) the written ministerial statement withdrew the Code for Sustainable Homes (in England) so Local Authorities will no longer require it as a planning condition for new approvals, nor will local authorities be able to enforce it. Where there are existing contractual arrangements, for example with Registered Social Landlords under the Affordable Funding Programme 2015-2018, it is possible to continue to register and certify against the Code.

One outcome from the review is dual level Building Regulations (Access and Water), which will give local authorities some choice to require developers to build to different standards than the minimum requirements. Furthermore, with appropriate evidence, local authorities can also use the new space standards which make up the new national technical standards. There will also be a new mandatory Building Regulation for security. The Building Regulations will be come into play as of October 2015.

The new dual level Building Regulations have come about because of clauses within the Deregulation Act. The Act also brings in a Clause which amends the Planning and Energy Act 2008 to prevent local authorities from requiring higher levels of energy efficiency than building regulations. This second clause has yet to be commenced, and the written ministerial statement sets out how this will be implemented in 2016.

As a result in the changes in Government Policy, the new build residential portion of the proposed development at 44 Gloucester Avenue will not be assessed under the Code for Sustainable Homes. However, the dwellings have been designed in line with Code for Sustainable Homes principles to ensure wellbeing of occupants, and that impacts to the environment are minimised where possible. The change-of-use residential portion of the scheme will be assessed under BREEAM Domestic Refurbishment, and the non-domestic portion of the scheme will be assessed under BREEAM Refurbishment and Fit-out 2014.

Camden Core Strategy 2010

The Camden Core Strategy sets out the Council's key planning policies and is a central part of their Local Development Framework (LDF). The recommendations for the sustainability policy is inserted below:

CS13 – Tackling climate change through promoting higher environmental standards Reducing the effects of and adapting to climate change

The Council will require all developments to take measures to minimise the effects of, and adapt to, climate change and encourage all developments to meet the highest feasible environmental standards that are financially viable during construction and occupation by:

a) Ensuring patterns of land use that minimise the need to travel by car and help support local energy networks;

b) Promoting the efficient use of land and buildings;

c) Minimising carbon emissions from the redevelopment, construction and occupation of buildings by implementing, in order, all of the elements of the following energy hierarchy:

- 1. Ensuring developments use less energy;*
- 2. Making use of energy from efficient sources, such as the King's Cross, Gower Street, Bloomsbury and proposed Euston Road decentralised energy networks;*
- 3. Generating renewable energy on-site; and*

d) Ensuring buildings and spaces are designed to cope with, and minimise the effects of, climate change.

The Council will have regard to the cost of installing measures to tackle climate change as well as the cumulative future costs of delaying reductions in carbon dioxide emissions.

Local energy generation

The Council will promote local energy generation and networks by:

e) Working with our partners and developers to implement local energy networks in the parts of Camden most likely to support them, i.e. in the vicinity of:

- housing estates with community heating or the potential for community heating and other uses with large heating loads;*
- the growth areas of King's Cross; Euston; Tottenham Court Road; West Hampstead Interchange and Holborn;*
- schools to be redeveloped as part of Building Schools for the Future programme;*
- existing or approved combined heat and power/ local energy networks;*

and other locations where land ownership would facilitate their implementation.

[Camden Core Strategy 2010-2025](#)
[Local Development Framework](#)



Sustainability Statement

f) protecting existing local energy networks where possible (e.g. at Gower Street and Bloomsbury) and safeguarding potential network routes (e.g. Euston Road);

Water and surface water flooding

We will make Camden a water efficient borough and minimise the potential for surface water flooding by:

g) protecting our existing drinking water and foul water infrastructure, including Barrow Hill Reservoir, Hampstead Heath Reservoir, Highgate Reservoir and Kidderpore Reservoir;

h) making sure development incorporates efficient water and foul water infrastructure;

i) requiring development to avoid harm to the water environment, water quality or drainage systems and prevents or mitigates local surface water and downstream flooding, especially in areas up-hill from, and in, areas known to be at risk from surface water flooding such as South and West Hampstead, Gospel Oak and King's Cross.

Camden Development Policies 2010

In addition to the Core Strategy Document the Camden Development Policies also forms part of the LDF. The policy relating to sustainability is listed below:

DP22 – Promoting sustainable design and construction

The Council will require development to incorporate sustainable design and construction measures. Schemes must:

a) demonstrate how sustainable development principles have been incorporated into the design and proposed implementation; and

b) incorporate green or brown roofs and green walls wherever suitable.

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

c) expecting new build housing to meet Code for Sustainable Homes Level 3 by 2010 and Code Level 4 by 2013 and encouraging Code Level 6 (zero carbon) by 2016.;

d) expecting developments (except new build) of 500 sq m of residential floorspace or above or 5 or more dwellings to achieve “very good” in EcoHomes assessments prior to 2013 and encouraging “excellent” from 2013;

e) expecting non-domestic developments of 500sqm of floorspace or above to achieve “very good” in BREEAM assessments and “excellent” from 2016 and encouraging zero carbon from 2019.

The Council will require development to be resilient to climate change by ensuring schemes include appropriate climate change adaptation measures, such as:

f) summer shading and planting;

g) limiting run-off;

h) reducing water consumption;

i) reducing air pollution; and

j) not locating vulnerable uses in basements in flood prone areas.

DP6 – Lifetime homes

Lifetime homes standards will be applied to all developments of self-contained housing, including conversions, re-configurations and changes of use.

Camden Development Policies
2010-2025
Local Development Framework

 Camden



Sustainability Statement

Camden Planning Guidance - Sustainability CPG3 - 2013

The Camden Planning Guidance support the policies set out in the Local Development Framework (LDF). While the Camden LDF contains policies relating to sustainability in their Core Strategy and Development Policies documents, the Council also has a separate planning guidance specific to sustainability.

The sections that will be covered by a combination of the Sustainability Statement and accompanying Energy Statement are listed below:

- The energy hierarchy
- Energy efficiency: new buildings
- Decentralised energy networks and combined heat and power
- Renewable Energy
- Water Efficiency
- Sustainable use of materials
- Sustainability assessment tools
- Brown roofs, green roofs and green walls
- Flooding
- Adapting to climate change
- Biodiversity

Guidance also recommends that developments should achieve at least 50% of the unweighed Energy, Water and Materials credits, under the Code for Sustainable Homes (CPG3 - paragraph 9.8).



Sustainability Statement

The London Plan 2015

The London Plan March 2015 (further alterations to the London Plan) requires compliance with the following policies relating to climate change:

- Policy 5.2 Minimising Carbon Dioxide Emissions (refer to the supplementary Energy Report)
 - *Development proposals should make the fullest contribution to minimising 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
 - *The Mayor will work with boroughs and developers to ensure that major developments meet a 40% 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.*

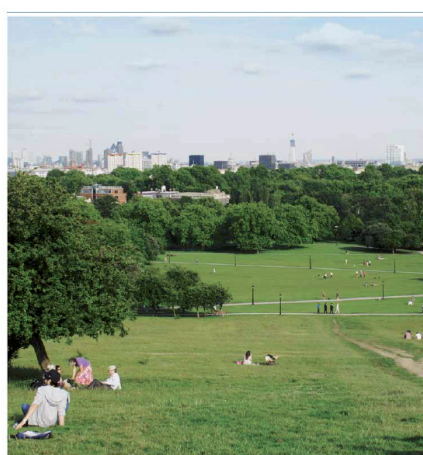
The GLA update of the London Plan (April 2014) states that a 35 per cent carbon reduction target beyond Part L 2013 of the Building Regulations will be required for major developments - this is deemed to be broadly equivalent to the 40 per cent target beyond Part L 2010 of the Building Regulations, as set out in London Plan Policy 5.2 above. Compliance with the following relevant London Plan policies are addressed within sections found later in this report.

- Policy 5.2 Minimising Carbon Dioxide Emissions
- Policy 5.3 Sustainable Design and Construction
- Policy 5.5 Decentralised Energy Networks
- Policy 5.6 Decentralised Energy in Development proposals
- Policy 5.7 Renewable Energy where feasible.
- 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
- Policy 5.18 Construction, Excavation and Demolition Waste

The following sections set out how Camden Council's Policies and the London Plan will be met by the proposed development at 44 Gloucester Avenue, through the implementation of energy efficiency measures and the adoption of strategies to achieve BREEAM domestic refurbishment 'Very Good' for refurbished domestic portions, and BREEAM Refurbishment and Fit-Out 'Very Good' for the non-domestic refurbishment portions of the scheme. The new-build dwellings are not required to be assessed under Code for Sustainable Homes as a result of the Housing Standards Review outcome issued in March 2015. Nevertheless, the dwellings have been designed in line with Code principles to ensure wellbeing of occupants, and that impacts to the environment are minimised where possible.

Compliance with policies 5.2, 5.5, 5.6 and 5.7 are addressed in the supplementary Energy Report for this development.



THE LONDON PLAN

SPATIAL DEVELOPMENT STRATEGY FOR GREATER LONDON
JULY 2011

MAYOR OF LONDON



Sustainability Statement

Sustainability Standards

The residential refurbishment component will be assessed using BREEAM Domestic Refurbishment. The non-domestic refurbishment component will be assessed using BREEAM Refurbishment and Fit-out 2014. The following sections provide an overview of these sustainability assessment methods.

Following the abolishment of Code for Sustainable Homes on 27 March 2015, there will be no requirement to assess the 22 no. new-build dwellings within this development under the Code for Sustainable Homes.

Site wide sustainability measures incorporated for the refurbishment portion of the scheme to achieve BREEAM 'Very Good' will also benefit the new build dwellings. These include:

- Improved building fabric
- Surface water drainage;
- Flood risk;
- Amenity space;
- Waste and recycling; and
- Improvement in biodiversity.

In addition, the dwellings have been designed with Code Principles in mind. These measures are detailed within the section Proposed Sustainability Measures for Dwellings.



BREEAM Domestic Refurbishment Pre-Assessment

BREEAM Domestic Refurbishment is a performance based assessment method and certification scheme for domestic buildings undergoing refurbishment, providing an authoritative rating for refurbished homes, covering houses, flats and apartments. It also recognises limitations of existing buildings including their inherent built form and location. Since June 2012, BREEAM Domestic Refurbishment has superseded the EcoHomes assessment method.

BREEAM Domestic Refurbishment measures the sustainability of a development against design categories, rating the entire development as a complete package. Each standard requires developments to gain credits by meeting sustainable design principles over seven key areas:

1. Management
2. Health and Wellbeing
3. Energy
4. Water
5. Materials
6. Waste
7. Pollution

The following section outlines the measures adopted for the refurbishment dwellings at 44 Gloucester Avenue to achieve BREEAM Domestic Refurbishment 'Very Good', reflecting the client and design team's aspirations in incorporating appropriate sustainability measures.

Management

MAN 1 Home User Guide

A 'Home User Guide' will be made available to the main 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.

MAN 2 Responsible Construction Practices

The tender specification will require contractors to be compliant with the Considerate Constructors Scheme (CCS). Additional credits have been awarded as it is expected that formal certification will be achieved and that contractors will operate beyond best practice.

MAN 3 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 CO₂ arising from site activities in respect to energy, water and materials.

MAN 4 Security

Where retained, external doors and windows will comply with minimum security requirements. Newly added external door sets will comply with PAS 24:2007 or LPS 1175 Issue 7 Security Rating 1 (or equivalent) and new windows will be certified to BS7950:1997 (36) or LPS 175 Issue 7 Security Rating 1 (or equivalent).

MAN 5 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 no features of ecological value.



Health and Wellbeing

HEA 1 Daylighting

Due to the retention of opening sizes in the existing parts of the Locally Listed building, there is limited potential to increase daylight levels beyond current levels. Hence, no credits can be assumed for this category.

HEA 4 Inclusive Design

The dwellings will comply with the minimum accessibility standards set out in checklist A-8 of the technical manual. The dwellings will also be in compliance with Lifetime Homes requirements.

HEA 5 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. In addition, the minimum levels of extract ventilation will be met in all wet rooms and minimum levels of purge ventilation will be provided to all habitable and wet rooms.

HEA 6 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

ENE 1 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 CO₂ savings achieved through energy efficiency measures, including insulation of external walls, ground floor and roofs, replacement of single glazed windows with double glazed units, and well as installation of energy efficient lighting and heating systems.

The preliminary SAP calculation for the proposed development at 44 Gloucester Avenue showed considerable reductions in energy demand in comparison to an existing baseline building of the same volume. The SAP calculation results indicate that the EER will increase by a minimum of 21 for the dwellings. This meets the minimum number of credits required for BREEAM 'Very Good', but falls short of meeting the mandatory credit requirement for BREEAM 'Excellent' in this credit issue.

It should be noted that external insulation of facades is not deemed to be suitable for the Locally Listed Building, and that internal insulation levels have been maximised with consideration for maintaining sufficient internal floor area for the dwellings. Energy efficiency of the fabric and building systems have been maximised based on the nature and characteristic of the existing building.



Sustainability Statement

ENE 2 Energy Efficiency Rating (EER) Post Refurbishment

Reduction in energy demand of the proposed main dwellings will be achieved through the use of well insulated external building elements, high performance glazing, use of efficient lighting throughout the dwellings, and the installation of energy efficient space heating and hot water systems.

SAP calculations results indicate that the minimum EER of 65 will be achieved for 44 Gloucester Avenue. This meets the EER required to meet BREEAM Domestic Refurbishment 'Very Good'.

ENE 3 Primary Energy Demand

An average primary energy demand of less than 160 kWh/m²/year will be achieved after refurbishment works are carried out for the development at 44 Gloucester Avenue

ENE 4 Renewable Technologies

The dwellings will benefit from the PV panels provided on the roof of the development. However, there it is likely that the amount of PV installed will be insufficient to score credits and hence no credits have been assumed for this category.

ENE 5 Energy Labelled White Goods

The dwellings will be supplied with energy efficient fridges and freezers or fridge freezers, washing machines and dishwashers that are recognised as Energy Saving Trust recommended appliances.

ENE 6 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 studios, one bed and two bed dwellings will include at least 4m of retractable drying lines either internally or externally, and the 3 bed dwellings will include at least 6m of retractable drying lines either internally or externally.

ENE 7 Lighting

External - Energy efficient light fittings will be installed in the 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

ENE 8 Energy Display Devices

Energy display devices will be installed in the main dwellings to enable the occupants to gain an understanding of their energy consumption and to enable them to reduce their energy use in the future. The display device will provide information on current electricity and primary heating consumption data.

ENE 9 Cycle Storage

Cycle storage spaces are provided for the users of the development. The cycle storage space will be adequately sized, secure and accessible to all residents, and one credit can be achieved in this category.

ENE 10 Home Office

A home office space will be allowed in an appropriate room within each dwelling, 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)



Sustainability Statement

Water

WAT 1 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.

The development at 44 Gloucester Avenue 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, below the minimum requirement for BREEAM Domestic Refurbishment 'Very Good'.

WAT 2 External Water Use

The development has no individual or communal garden space, therefore this credit can be awarded by default.

WAT 3 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.



Sustainability Statement

Materials

MAT 1 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

It is assumed that most of the main building elements within this development will achieve between an A+ to C rating.

MAT 2 & MAT 3 Responsible Sourcing of Materials and Insulation

At least 80% 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 CO₂ 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

WAS 1 Household Waste

Dedicated external waste storage for the dwellings will be provided to meet the BREEAM and Local Authority requirements. Space for a 1500mm diameter turning circle or 1700x1400mm turning ellipse should be provided.

Adequate internal storage for recyclable waste will be provided to all dwellings in a dedicated position. The Local Authority provides recyclable household waste collection and sorting.

WAS 2 Refurbishment Site Waste Management

The development will minimise the impact of construction waste on the environment through a 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.



Sustainability Statement

Pollution

POL 1 NOx Emissions

The 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 individual high efficiency gas boilers with low inherent NOx emissions. Gas boilers with NOx emissions of less than 40 mg/kWh will be specified.

POL2 Surface Water Runoff

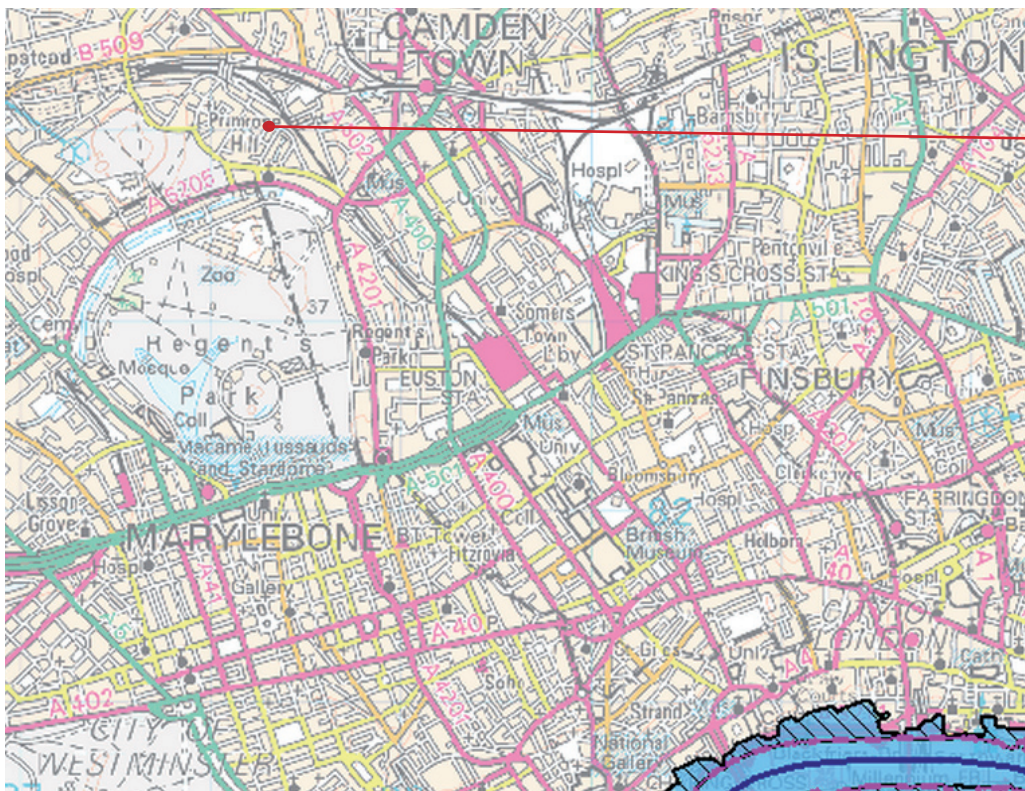
As there will be no increase of the building footprint as a result of the refurbishment, there will be a neutral impact on surface water and the credit can be awarded by default.

POL3 Flooding

The Environment Agency flood map (as below) shows the site to be at low risk of flooding. Hence, full credits will be awarded in this category. A Flood Risk Assessment will be carried out post planning to confirm this.

Key

- Flooding from rivers or sea without defences ■
- Extent of Extreme flood ■
- Areas benefiting from flood defences
- Approximate site location ●



EA Flood Map - showing site located within area of low flood risk from seas and rivers



Sustainability Statement

BREEAM Domestic Refurbishment Pre-Assessment Results

A BREEAM Domestic Refurbishment pre-assessment was carried out for the dwellings at 44 Gloucester Avenue using the targets set by the client and project team. The table below summarises the number of credits achieved for the dwellings in each of the BREEAM categories, using the BRE Pre-Assessment Estimator.

The dwellings at 44 Gloucester Avenue achieve a total of 65.46 credits, which exceeds BREEAM 'Very Good'. This reflects the client's and project team's commitment in adopting a range of sustainability measures over the life-cycle of the development.

		Credit Score	Credits Available	Score Assessment		
				Sub Total	Weighting Factor	Points Score
Management	MAN 1 Home User Guide	3	3	8	12%	8.73%
	MAN 2 Responsible Construction Practices	2	2			
	MAN 3 Construction Site Impacts	1	1			
	MAN 4 Security	1	2			
	MAN 5 Protection & Enhancement of Ecological Features	1	1			
	MAN 6 Project Management	0	2			
Health & Wellbeing	HEA 1 Daylighting	0	2	4	17%	5.67%
	HEA 2 Sound Insulation	0	4			
	HEA 3 Volatile Organic Compounds	0	1			
	HEA 4 Inclusive Design	2	2			
	HEA 5 Ventilation	1	2			
	HEA 6 Safety	1	1			
Energy	ENE 1 Improvement in Energy Efficiency Rating	2.5	6	18.5	43%	27.43%
	ENE 2 Energy Efficiency Rating Post Refurbishment	2	4			
	ENE 3 Primary Energy Demand	6	7			
	ENE 4 Renewable Technologies	0	2			
	ENE 5 Energy Labelled White Goods	2	2			
	ENE 6 Drying Space	1	1			
	ENE 7 Lighting	1	2			
	ENE 8 Display Energy Devices	2	2			
	ENE 9 Cycle Storage	1	2			
	ENE 10 Home Office	1	1			
Water	WAT 1 Internal Water Use	2.5	3	4.5	11%	9.90%
	WAT 2 External Water Use	1	1			
	WAT 3 Water Meter	1	1			
Materials	MAT 1 Environmental Impact of Materials	8	25	16	8%	2.84%
	MAT 2 Responsible Sourcing	4	12			
	MAT 3 Insulation	4	8			
Waste	WAS 1 Household Waste	2	2	4	3%	2.40%
	WAS 2 Refurbishment Site Waste Management	2	3			
Pollution	POL 1 NOx Emissions	3	3	6	6%	4.50%
	POL 2 Surface Water Runoff	1	3			
	POL 3 Flooding	2	2			
Innovation		4		4	10%	4.00%
Level Achieved:		Very Good		Total Point Scored: 65.46%		



BREEAM Refurbishment and Fit-Out 2014

BREEAM Refurbishment and Fit-Out 2014 is a performance based environmental assessment method and certification scheme for refurbishment of buildings for non-domestic use. The primary aim of BREEAM Refurbishment and Fit-Out 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 Refurbishment Part 1 (Fabric and Structure) Pre-Assessment was carried out for the non-domestic portions of the development.

The credits appraised in this evaluation are based on calculations carried out through the online tool available at the time of assessment from the BREEAM projects website. 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%).

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



Management

Man 01 Project Brief and Design

Prior to completion of the Concept Design (RIBA Stage 2 or equivalent), a project delivery consultation meeting will be held to identify and define their roles and responsibilities at each key stage of the project delivery. A third party stakeholders' consultation will also be carried out in line with BREEAM requirements.

Man 02 Life cycle cost and service life planning

The capital cost of the refurbishment works will be reported via the BREEAM Assessment Scoring and reporting tool to gain 1 credit.

Man 03 Responsible construction practices

All timber used in the project will be 'legally harvested and traded' timber. This is a prerequisite for the following issues, which will also be included for this project:

- The principal contractor will operate a compliant Environmental Management System covering their main operations.
- The principal contractor will achieve exemplary compliance with the Considerate Constructors Scheme and go beyond best practice with a total CCS score of more than 40 points, and a minimum score of 7 in each of the 5 sections.
- Energy use and water consumption from on-site construction processes will be monitored and recorded.



Man 04 Commissioning and Handover

A schedule including a time scale for commissioning and testing all building services and control systems will be completed. An appropriate team member will be appointed to monitor and programme all commissioning requirements on behalf of the client.

During the design stage, a specialist commissioning manager will be appointed to undertake design reviews and provide management of the commissioning.

Inspection of the building fabric via a thermographic survey and an airtightness test in accordance with the Building Regulations, BSRIA and CIBSE guidelines shall be undertaken.

A Building User Guide and a training schedule will be prepared for the building occupier and user, to ensure the efficient operation and maintenance of the building.

Man 05 Aftercare

Aftercare support will be provided to the building occupiers for at least the first month of building occupation. This is to include on-site facilities management training, on-site attendance on a weekly basis to support building users and management, presentation of the Building User Guide and training schedule, as well as introducing key features of the refurbished building including the building systems and their controls. Longer term aftercare support (e.g. a helpline) will also be provided for at least the first 12 months of operation.

Post occupancy evaluation will be conducted by an independent party one year after initial building occupation to gain in-use performance on a range of conditions including internal environmental conditions, control, operation and other relevant issues.



Health and Well being

Hea 01 Visual comfort

A glare control strategy (e.g. internal blinds) will be put in place through best practice design measures to remove potential for disabling glare.

Hea 04 Thermal comfort

A thermal model will be built in accordance with CIBSE AM11 to inform the development of a thermal zoning and control strategy.

Hea 05 Acoustic performance

The building will be designed to meet the acoustic performance standards and internal ambient noise levels in compliance with the design ranges given in BS 8233:2014. A programme of pre-completion testing will be carried out by a compliant test body.

Hea 06 Safety and security

A suitably qualified security specialist will conduct a Security Needs Assessment during the Concept Design stage of the project, and the resulting set of recommendations will be implemented on site.

Energy

Ene 01 Reduction of energy use and carbon emissions

An SBEM calculation was carried out to determine the energy demand and CO₂ emissions for the baseline and actual buildings. The results were subsequently applied to the Ene01 calculator within the BREEAM Refurbishment and Fit-out 2014 Pre-assessment Scoring Tool.

An overall building energy performance ratio (EPRNDR) of 0.30 is achieved for the proposed development through a number of energy efficiency measures which are discussed in the accompanying Energy Statement. This meets the mandatory requirement for BREEAM 'Very Good' in this category.



Sustainability Statement

Transport

Tra 01 Sustainable transport solutions

The proposed development will be accessible by public transport, being served by London buses (including night time services), national and underground rail services. The site has a PTAL of 4, showing very good accessibility to public transport with an Accessibility Index of 16.09.

Tra 02 Proximity to amenities

There are food outlets and a cash point in close proximity to the building site. The nearby Regent's Park road contains amenities for use by building occupants.

Tra 03 Cyclist facilities

A minimum of 10 no. cycle storage spaces for use by occupants of the non-domestic spaces will be provided. These will be within proximity of the main building entrance. The spaces will be protected from the weather while the cycles are secured within spaces in racks. Both the covered area and the racks will be set in or fixed to a permanent structure.

Tra 05 Travel Plan

A site specific travel assessment has been carried out, and a travel plan will be developed as part of the feasibility and design stages.



Materials

Mat 01 Environmental Impact of Materials

The materials specified for the main building elements will have a low environmental impact. For this development, the external walls, windows, upper floor slabs, internal walls, roof and floor finishes will achieve Green Guide ratings of between A+ and C.

Mat 03 Responsible Sourcing of Materials

All timber and timber based products specified will be legally harvested and traded timber. Building materials used for the main construction elements will be 'responsibly sourced' with a documented Sustainable Procurement plan in place.

In addition, at least 18% of the responsible sourcing of materials (RSM) points will be achieved in accordance with the BREEAM methodology.

Mat 04 Insulation

All insulation specified for the development will have a low embodied environmental impact relative to its thermal properties. Insulation specified for use within external walls, ground floor, roof and building services will be assessed and the Insulation Index should be equal to or greater than 2.5.

Mat 05 Designing for Durability and Resilience

Suitable durability and protection measures or designed features will be incorporated into the building to prevent damage to vulnerable parts.

Relevant building elements incorporate appropriate design and specification measures to limit material degradation due to environmental factors.

Mat 06 Material Efficiency

The design and construction teams will identify opportunities where material use can be optimised during the RIBA stages 1-5 (Preparation and Brief through to Construction).

Waste

Wst 01 Construction waste management

A Resource Management Plan (RMP) or Site Waste Management Plan (SWMP) covering non-hazardous construction waste and dedicated off-site manufacture will be developed to ensure that the amount of waste generated is lower than or equal to 4.5m³ per 100m² of gross internal floor area.

A pre-refurbishment audit will also be carried out for any existing buildings and structures or hard surfaces, to identify key refurbishment/demolition materials and highlight the potential issues in the reuse and recycling of these materials. This audit must be referenced in the RMP/SWMP.

Was 02 Recycled aggregates

The construction team will recognize and encourage the use of recycled, secondary and reuse aggregates in situ. The amount of recycled or secondary aggregate meeting the above criteria will be greater than 25% (by weight or volume) of the total aggregate specified and be construction, thereby reducing the demand for virgin materials.

Wst 03 Operational waste

There will be dedicated space to cater for the segregation and storage of operational recyclable waste volumes generated by the assessed building/unit, its occupant(s) and activities.

Wst 06 Functional adaptability

The non-domestic portion of the scheme will be developed as shell only, to be fitted out by prospective tenants. A building specific functional adaptation strategy study will be conducted by RIBA Stage 2, including recommendations to incorporate measures for future building adaptation. Where practical and cost effective, these measures are to be implemented.

Land Use & Ecology

LE 02 Protection of ecological features

A Preliminary Ecological Appraisal was undertaken in January 2015. The development site is a former non-domestic building dominated by buildings and hardstanding with no vegetation and appears to be of Low Ecological Value. However, the buildings on the site have some potential to support roosting bats. Further surveys will be undertaken to confirm whether bats do use the buildings on the site. If bats are present then advice will be sought from Natural England on how to proceed. Any features of ecological value surrounding the site will be protected in line with BS 42020: 2013.

LE 04 Enhancing site ecology

A SQE has been appointed to the project and has undertaken a Preliminary Ecological Appraisal of the site. The SQE has provided recommendations on the protection and enhancement of site ecology, which will be implemented in the refurbishment development.

Pollution

Pol 03 Surface water run off

The Environmental Agency Flood Map (Page 16) shows that the development is located in an area with a low probability of flooding. A Flood Risk Assessment will be carried out for the site to confirm this. There will be no increase in impermeable surfaces as a result of the refurbishment.

Pol 05 Noise Attenuation

The development is located in an area with a combination of commercial and residential buildings within an 800m radius.

A noise impact assessment will be carried out by a suitably qualified acoustician to ensure that the difference in noise levels from the proposed development is no greater than +5dB during the day (0700hrs to 2300hrs) and +3dB at night (2300hrs to 0700hrs) compared to the background noise level.



Sustainability Statement

BREEAM Pre-assessment Results

A BREEAM Refurbishment and Fit-Out pre-assessment was carried out for the non-domestic portion of the 44 Gloucester Avenue development, based on a basic shell fit and B1 use. The commercial area is assessed under Part 1- Fabric and Structure scheme.

The proposed development has the potential to achieve a total of 58.07 credits. This exceeds the minimum credits (score>55) required to meet BREEAM 'Very Good'. It is recommended that the measures included in this report be incorporated into the site strategy and building design at an early stage to ensure compliance.

BREEAM Section			Score Assessment		
			Sub Total	Weighting (%)	Score (%)
Management	Man 01 Project brief and design	2	12	15	9.27%
	Man 02 Life cycle cost and service life planning	1			
	Man 03 Responsible construction practices	4			
	Man 04 Commissioning and handover	3			
	Man 05 Aftercare	2			
Health & Wellbeing	Hea 01 Visual comfort	1	5	14.8	5.35%
	Hea 02 Indoor air quality	0			
	Hea 04 Thermal comfort	1			
	Hea 05 Acoustic performance	2			
	Hea 06 Safety and security	1			
Energy	Ene 01 Reduction of energy use and carbon emissions	5	5	16.4	4.94%
	Ene 04 Low carbon design	0			
Transport	Tra 01 Public transport accessibility	3	8	10.0	9.65%
	Tra 02 Proximity to amenities	1			
	Tra 03 Cyclist facilities	1			
	Tra 04 Maximum car parking capacity	2			
	Tra 05 Travel plan	1			
Materials	Mat 01 Life cycle impacts	4	9	15.6	11.71%
	Mat 03 Responsible sourcing	2			
	Mat 04 Insulation	1			
	Mat 05 Designing for durability and resilience	1			
	Mat 06 Material efficiency	1			
Waste	Wst 01 Construction waste management	3	5	9.4	6.75%
	Wst 02 Recycled aggregates	0			
	Wst 03 Operational waste	1			
	Wst 05 Adaptation to climate change	0			
	Wst 06 Functional adaptability	1			
Land Use & Ecology	LE 02 Ecological value of site and protection of ecological features	1	2	12.5	4.52%
	LE 04 Enhancing site ecology	1			
	LE 05 Long term impact on biodiversity	0			
Pollution	Pol 03 Surface water run off	3	4	6.3	3.85%
	Pol 05 Noise attenuation	1			
Innovation	Inn 01 Innovation	2	0	10	2.0%
BREEAM - 'Very Good'			Total Points Scored:	58.07%	



Sustainability Statement

Constraints preventing the unit from achieving BREEAM Refurbishment and Fit-Out 'Excellent'

The design team recognise that Camden Council's Development Policy DP22, and Section 9 in CPG3 Sustainability 2013 encourages major non-residential developments to achieve BREEAM 'Excellent'. The design team have strived to achieve the highest BREEAM level possible, considering the refurbishment nature of the scheme, and the degree of conservation required for the retained Locally Listed buildings on site.

The BREEAM Pre-Assessment undertaken for the non-domestic portion of the development at 44 Gloucester Road in this Sustainability Statement has been carried out at early design stage, comprising of a basic shell construction. The Pre-Assessment shows that although the developer and design team have committed to maximise credits where feasible in order to achieve the highest possible rating, which is currently forecast to exceed BREEAM 'Very Good'. The scheme is deemed technically infeasible to meet the BREEAM 'Excellent' target set out in Camden Council's Policies.

The following section details the items that are considered to be difficult or infeasible to achieve, thereby preventing the non-domestic space at 44 Gloucester Avenue from meeting BREEAM 'Excellent'.



Sustainability Statement

Hea 01 Visual Comfort

Due to the existing site layout, and that a significant portion of the commercial part is situated at basement level, the view out requirement for daylight credits cannot be achieved. Nevertheless, large area of glazing will be maintained at ground floor level to provide sufficient daylight to the non-domestic units.

Hea 02 Indoor Air Quality

Due to the urban location of the site, and the configuration of the existing protected building, it is not feasible to locate windows or air intake to the building at a distance from pollution sources such as like roads and parking spaces to meet minimum BREEAM requirements for this credit issue. Furthermore, it would not be possible to provide operable windows to the non-domestic spaces at basement level to meet the natural ventilation requirement for this issue.

Ene 01 Reduction of CO₂ emissions and Ene 04 Low carbon design

The proposed Part 1 Fabric and Structure refurbishment is expected to improve upon the U-values of external elements. A breakdown of the proposed improvement to existing building fabric elements can be found in the table to the right.

The thermal performance (U-values) of the floor, walls and windows will be improved significantly over the existing values. However, further improvement to u-values of the external elements is not considered to be feasible due to cost and space constraints.

A small portion of the commercial part consists of new build elements, the thermal performance of this portion exceeds the requirements set out by Part L2A building regulations.

U-Values (W/m²K) - Retained and upgraded and new elements for non-domestic spaces

Element	Existing Elements value	Upgraded Elements value	New Elements only
Walls	2.10	0.50	0.15
Ground Floor	0.70	0.25	0.10
Windows/ Doors	4.80	2.00	0.10
Roof	2.30	0.18	1.30

Ene 04 Low Carbon Design

The commercial component of the 44 Gloucester Avenue development was designed to function independently as a self-contained unit, separate from the residential portion of the development. This would mean that issues such as access to the roof for the PV arrays would arise as this area of the development would be under different ownership and management. The PV located on the roofs is unable to belong to and benefit the commercial units without the units incurring a costly maintenance charge and requiring access through the secure residential cores. Therefore, in this case, a connection to the proposed zero carbon technology available on site will not be feasible.

The above demonstrates that a building of this type, usage and location and conservation requirements cannot reasonably reduce its energy use and CO₂ emissions any further.



Sustainability Statement

Mat 03 Responsible Sourcing

There are a limited number of credits available in this section as the scores are awarded based on the types of certificates that can be collected based on material specifications. Timber products and products certified by the BRE gain more points than non-timber products that receive an ISO14001 EMS certificate. The type of materials together with the suppliers available at the time of construction will cap the credit score available in this section.

The materials chosen for this site were based on the sustainable and practical choices as listed above. The contractor will be instructed to collect responsible sourcing certificates for the building materials; however, this is restricted to the certificated made available by various manufacturers. The credits in this section can therefore be maximised only at later design stages, when more information about the tenant and choice of material is available.

Was 01 Construction waste management

The team have made a commitment where possible to salvage materials for reuse and recycling, however the targets are deemed difficult to achieve as some aspects will need new materials.

LE 05 Long term impact on biodiversity

The site currently has very little or no features of ecological value. Given that the roof space is needed for the provision of PV panels, green or brown roofs are not practicable. Hence, there is limited scope for this credit to be awarded.

Pol 03 Flood risk and reducing surface water run-off

Due to the need to maximise the PV array on the roof, there is limited opportunity for the installation of a green or brown roofs to reduce surface run-off. Therefore, the additional credits for surface water run-off and treatment cannot be achieved.

Conclusion

Although the proposed non-domestic spaces at 44 Gloucester Avenue is unable to achieve the BREEAM 'Excellent' target set out by Camden Council due to various site constraints and the retained buildings being designated as Locally Listed Building, the measures adopted to meet BREEAM 'Very Good' reflects the commitment from the client and the design team with regards to achieving sustainable design and operation of the building over its lifetime.



Proposed Sustainability Measures for New Build Dwellings

The following subsections detail the sustainability measures that will be incorporated into the design of the proposed new build dwellings.

Energy

Dwelling Emission Rate and Fabric Energy Efficiency

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 is SAP 2012.

Preliminary SAP calculations were carried out to assess the potential CO₂ savings achieved through

- Energy efficiency measures
- The efficient supply of energy and
- Maximising the provision of renewable systems.

The energy demand of the dwellings will be reduced significantly through the adoption of high levels of insulation and good levels of air tightness to improve the buildings' fabric efficiency. SAP calculations were based on a building fabric with low U-values and an air permeability rate of 3m³/m² at 50 Pa.

The preliminary calculations showed a significant improvement over Part L Building Regulations 2013, amounting to a 9.7% reduction in regulated CO₂ emissions for the residential portion of the scheme. It should be noted that the building fabric has been improved as far as possible beyond Part L 2013 Building Regulations targets. The area of the PV array has also been maximised based on the available roof area on the new buildings, whilst retaining the appearance and characteristics of the existing facades and roof of the retained buildings. It was also not deemed suitable to install communal heating systems such as communal Combined Heat and Power (CHP) and biomass plants for the development of a relatively small scale and mainly refurbishment nature.

Energy Display Devices

An energy display device will be installed to enable the 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 fuel consumption data.

Drying Space

The proposed dwellings will include provisions for internal clothes drying where appropriate, thereby reducing the amount of electricity consumed through the use of tumble dryers.

Energy Labelled White Goods

The dwellings will be supplied with an EU Energy Efficiency Labelling Scheme Leaflet to help the tenants choose energy efficient white goods.

External Lighting

Energy efficient light fittings will be installed throughout the development where appropriate. 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



Sustainability Statement

Low or Zero Carbon Technologies

Photovoltaic panels will be installed on the roof of the new buildings to provide a renewable and low carbon energy source.

Cycle Storage

Cycle storage spaces will be provided within the development for use by users of the residential units to reduce the frequency of short car journeys. The cycle storage will be adequately sized, secure and accessible to all occupants.

Water

Indoor Water Use

The new build dwellings at 44 Gloucester Avenue aims to reduce water consumption to less than 105 litres per person per day, in line with the recommended target set out by Camden Council through the use of water efficient fittings, and these are listed below.

Proposed water fittings for the new build dwellings

Fitting	Consumption per Use	Consumption (l/person/day)
WC (full flush)	6 litres per flush	
WC (half flush)	3 litres per flush	
All WCs		17.64
Kitchen sink tap	6 litres per min	13
Wash basin tap	3 litres per min	7.9
Bath	180 litres to overflow	19.8
Shower	8 litres per min	34.96
Washing machine	8.17	17.16
Dishwasher	1.25	4.5
Net internal water consumption		114.96
Normalisation factor		0.91
Total		104.6



Sustainability Statement

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

It is assumed that most of the main building elements within this development will achieve between an A+ to C rating where possible.

Aggregates from the demolition of any existing hard surfacing/landscaping on site will be crushed and used as substrate material for the building base and road surfaces where possible. All timber used during site preparation and construction to be FSC certified, and all non-timber materials to be certified with Environmental Management Systems (ISO 14001 OR BES 6001) where possible.



Surface Water Run-off

Landscaped areas have been maximised to reduce the amount of surface water run off from the site.

The Environment Agency flood map shows the proposed development to be located within an area at low risk of flooding.

Waste

Household Waste

Dedicated external waste storage for the dwellings will be provided to meet the Local Authority requirements.

Adequate internal storage for recyclable waste will be provided to all dwellings in a dedicated position. The Local Authority provides recyclable household waste collection and sorting.

Construction Site Waste Management

The development will minimise the impact of construction waste on the environment through a Resource Management Plan or Site Waste Management Plan. This plan will include:

- Benchmarks for resource efficiency
- Procedures and commitments to reduce hazardous and non-hazardous waste
- Monitoring hazardous and non-hazardous waste

Sustainability Statement

Health and Wellbeing

Daylighting

The dwellings have been designed with daylight in mind and measures have been taken to maximise daylight where possible.

Sound Insulation

The development proposes that airborne sound insulation will comply or exceed current Building Regulations Part E standards.

Lifetime Homes

All dwellings will be designed in line with Lifetime Homes principles, ensuring that they are easily adaptable for future use.

Management

Considerate Constructors Scheme

The tender specification will require contractors to be compliant with the Considerate Constructors Scheme (CCS). The development will achieve a total score of 35 or more under the current scheme, and at least a score of 7 under every section.

Construction Site Impacts

To minimise the construction impacts of the site, contractors will be required to monitor, report and set targets for:

- The production of CO₂ arising from site activities
- Water consumption from site activities

In addition, contractors will be required to adopt best practice policies for air (dust) and water (ground and surface) pollution occurring on site. All timber will be sourced following the Government's Timber Procurement Policy.

Ecology

Ecological Value of Site and improvements

A Preliminary Ecological Appraisal was undertaken in January 2015. The development site is a former non-domestic building dominated by buildings and hardstanding with no vegetation and appears to be of Low Ecological Value. However, the survey identified the possibility of bats using the buildings for roosting. The actual ecological value of the site will therefore be confirmed once further surveys have been undertaken by a suitably qualified ecologist (SQE) at post-planning stage. Recommendations provided by the ecologist will be adopted at post planning stage.

Building Footprint

The density of development on site has been maximised within the local context.

