Sustainability Statement

92 Fitzjohn's Avenue, Hampstead

For MAKE

Feburary 2013

XCO2 energy

w: www.xco2energy.com :: e: mail@xco2energy.com
t: +44 (0) 20 7700 1000 :: f: +44 (0) 20 7183 6620
Unit 1.01 :: 50-52 Wharf Road :: London :: N1 7EU

Contents

About us:
XCO2 Energy are a low-carbon consultancy working in the built environment. We are a multi-disciplinary company consisting of both architects and engineers, 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	Issue 05
Remarks	Draft	Revised Draft	For Issue	For Issue	For Issue
Prepared by	SP	SP	SP	SP	SP
Checked by	RM	RM	RM	RM	RM
Authorised by	RM	RM	RM	RM	RM
Date	31/08/2012	22/01/2013	30/01/2013	18/02/2013	25/02/2013
Project reference	8.250	8.250	8.250	8.250	8.250

Executive Summary

This report outlines the sustainability strategy for the proposed single dwelling at 92 Fitzjohn's Avenue, in line with the requirements set out by the London Borough of Camden.

This sustainability statement is divided into two parts:

- Local sustainability policies
- Code for Sustainable Homes

The first part provides an overview of the site and planning policies applicable to this development base on the Camden Local Development Framework. The report then demonstrates how the policies have been met. In accordance with the Camden Planning Guidance 2011, Sustainability CPG3, the sustainability requirements have also been addressed.

The body of this report outlines the sustainability measures that have been adopted to achieve Code for Sustainable Homes level 4. A summary of the pre-assessment credits for the Code for Sustainable Homes is provided at the end of the report.

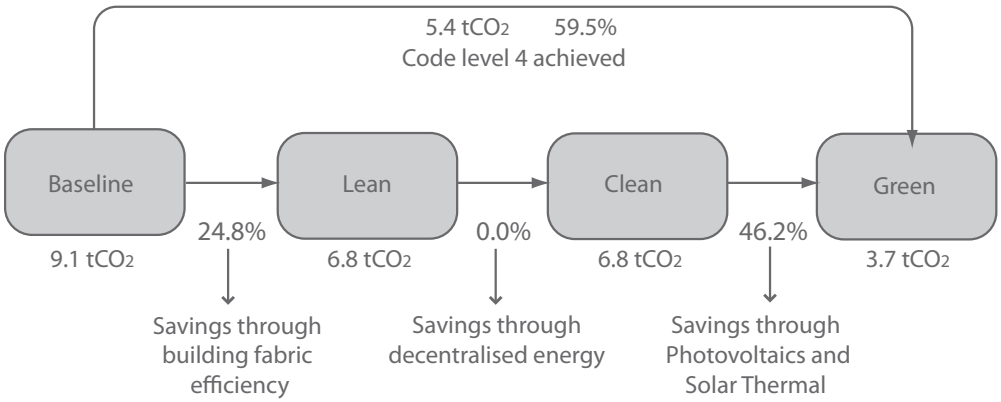
In summary, the proposed development at 92 Fitzjohn's Avenue meets the targets set out by Camden Council.

The dwelling achieves 70.74 credits, which exceeds the required 68 credits for Code for Sustainable Homes level 4. In addition, mandatory Code level 4 credits in the Energy and Water categories have also been satisfied. The proposed development will also meet all principles of Lifetime Homes as required by Camden Council's Policy DP6.

The number of credits obtained in the Code pre-assessment reflects the client and design team's aspirations in incorporating as many sustainability measures as possible, and of significantly exceeding Level 4 minimum credit requirements.

The diagram below provides a summary of the CO_2 savings achieved over Part L Building Regulations (2010) for the development. The 59.5% reduction in CO_2 emissions reflects regulated energy use only, in accordance with Part L Building Regulations. Unregulated energy use is not taken into account in the calculation of Code credits (e.g. plug-in load and appliances).

Total savings over Part L 2010 Building Regulations
(savings is based on regulated energy only in accordance with Part L)



Site

The proposed development of 92 Fitzjohn's Avenue includes a single dwelling to be located east of Fitzjohn's Avenue, adjacent to Henderson Court Resource Centre and St. Anthony's Preparatory School in Hampstead, within the London Borough of Camden.

The habitable area of the proposed dwellings is distributed over two storeys, with the main living area at entrance floor level and bedroom accommodations planned for both floors. The development will replace an existing residential building and car parking on site.

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

Approximate site location and site boundary of 92 Fitzjohn's Avenue

Planning Policies

The development is in line with the requirements set out by the London Borough of Camden.

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 development 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

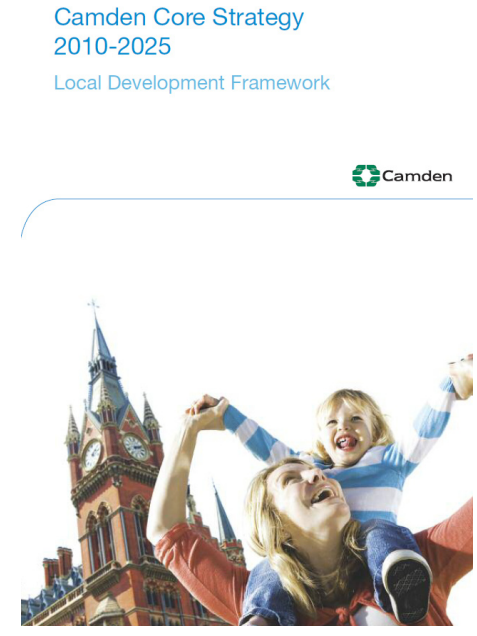
The Council will promote local energy generation and networks by:

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.

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, including the relevant measures set out in paragraph 22.5 below, 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.

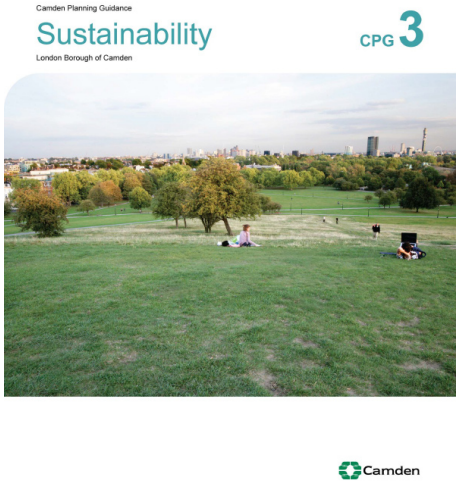
DP6 – Lifetime homes
Lifetime homes standards will be applied to all developments of self-contained housing, including conversions, re-configurations and changes of use.

Camden Planning Guidance - Sustainability CPG3 - 2011

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

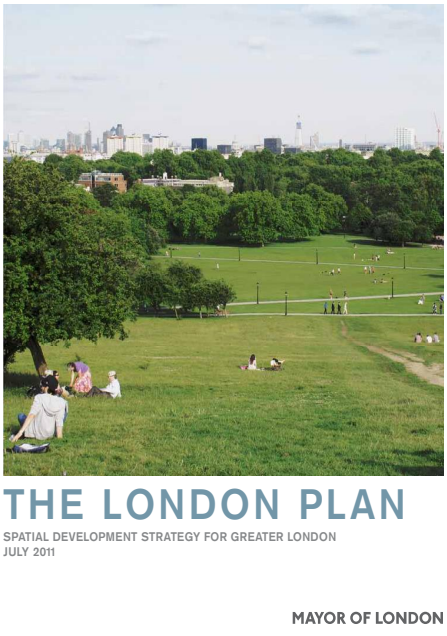
Guidance also recommends that developments should achieve at least 50% of the unweighted energy credits under the Code for Sustainable Homes (paragraph 3.22).



The London Plan 2011

In addition to the Camden policies the London Plan 2011 contains the following:

- Policy 5.2 Minimising Carbon Dioxide Emissions (refer to the supplementary Energy Report)
- Policy 5.3 Sustainable Design and Construction Policy 5.5 Decentralised Energy Networks (refer to the supplementary Energy Report)
- Policy 5.6 Decentralised Energy in Development Proposals (refer to the supplementary Energy Report)
- Policy 5.7 Renewable Energy (refer to the supplementary Energy Report for more details)
- Policy 5.9 Overheating and Cooling
- Policy 5.10 Urban Greening
- Policy 5.11 Green Roofs
- Policy 5.12 Flood Risk Management
- Policy 5.13 Sustainable Drainage
- Policy 5.15 Water use and Supplies
- Policy 5.16 Waste Self-Sufficiency
- Policy 5.18 Construction, Excavation and Demolition Waste
- Policy 5.19 Hazardous Waste
- Policy 5.20 Aggregates



Response to Planning Policies

The relevant sections of the CPG3 Sustainability planning guidance have been addressed below:

Energy efficiency: new buildings

Sunlight and Daylight

The development has been designed to provide good levels of daylight and sunlight. This will help to avoid the use of energy-intensive artificial lighting and space heating. The proposal incorporates floor-to-ceiling windows on the southeastern elevation for all living and bedroom spaces to maximise daylight penetration into the narrow planned building.

Preventing Overheating

Overheating has been prevented by providing shading through the use of overhangs, particularly on the southeastern elevation. The outdoor spaces have been positioned towards the southeast and southwestern sections of the site to enable the capture of southwesterly winds for natural cooling during the warmer summer months.

Natural Ventilation

The dual aspect design of the ground floor and slim-line upper levels windows on the two tier roof will promote cross ventilation, whilst single-sided ventilation will be possible in all bedroom spaces at the lower ground floor. There is also the strategy of stack ventilation of the living room at night or during periods of low wind speed. The site is slightly sheltered by surrounding buildings from the south-western prevailing winds. However, high- and low-level windows will be designed in order to promote air flow rate to maximise ventilation rate when required.

During the winter, the dwellings will be naturally protected from cold north-easterly winds as northeastern openings at the main house are shielded by neighbouring buildings to the north. Existing trees located to the north/northwest of the proposed buildings will be retained to further protect the site.

The utilisation of natural ventilation for provision of fresh air and cooling will effectively reduce electricity use and CO_2 emissions associated with the use of fans within a mechanical ventilation system.

Thermal Mass

The proposed dwellings will be constructed primarily from thermally heavy materials including concrete and brickwork. High thermal mass of the building will act as a buffer against high fluctuations in internal temperature and improve thermal comfort for occupants. During winter, thermal mass will enable storage of solar heat gains for passive heating of living and bedroom spaces. And during warmer summers, it will absorb internal heat gains during the day and be cooled by ventilation at night.

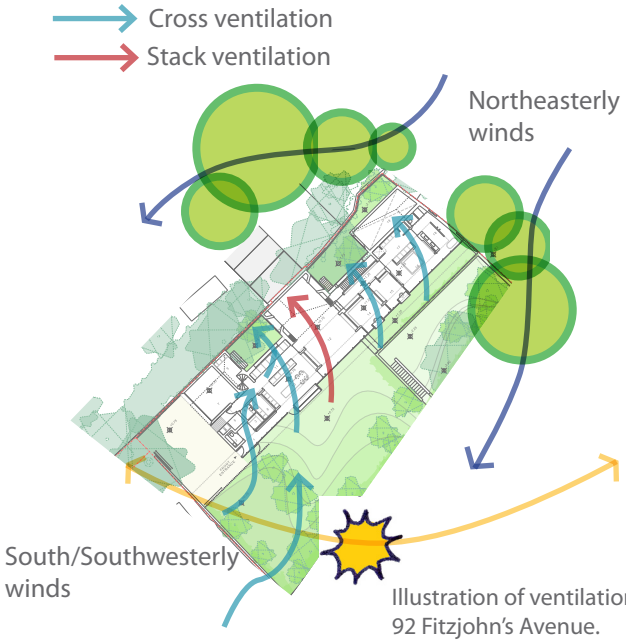
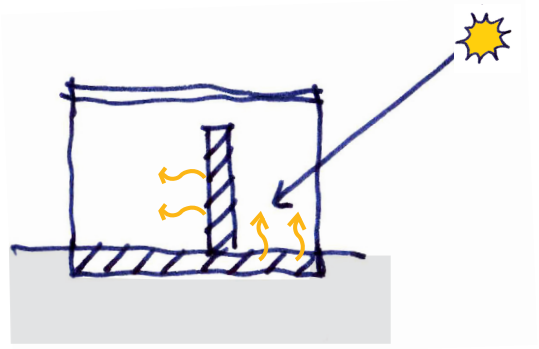


Illustration of ventilation strategy at 92 Fitzjohn's Avenue.



Use of thermal mass for passive heating of internal spaces during winter.

Water Efficiency

The proposed development intends to specify low flow shower heads and taps, as well as dual flush toilets to reduce water consumption. Irrigation of gardens will mostly rely on rainwater. Furthermore, a rainwater harvesting system will be implemented on non-permeable roof surfaces to maximise on-site reuse of rainwater. Further information is provided in the water section of the Code of Sustainable Homes assessment in this report.

Sustainable use of materials

The development will aim to re-use materials from the demolition of the existing building on-site as part of the new development where possible. This will primarily include the use of demolition material as hard core. A Construction Site Waste Management Plan will be implemented (refer to Code assessment in this report for details).

Landscape and Garden

Extensive landscaped areas at ground level and lower ground level have been incorporated into the proposed design. A biodiverse roof with a wildflower blanket will be installed at roof level. The gardens will also be planted with species native to the UK woodland environment to maximise suitable habitat for local flora and fauna.

Biodiversity

Biodiversity on site will be enhanced in comparison with the existing building and car parking.

Adapting to climate change

The development has used the following measures to mitigate against climate change:

- The building is shaded to prevent excessive solar gains from the sun
- Landscaped gardens have been used to soak up excess rainwater and cool the surrounding air through transpiration.
- Natural ventilation has been used to ventilate the dwellings.

Lifetime Homes

The proposed dwelling will meet all 16 principals of Lifetime Homes.

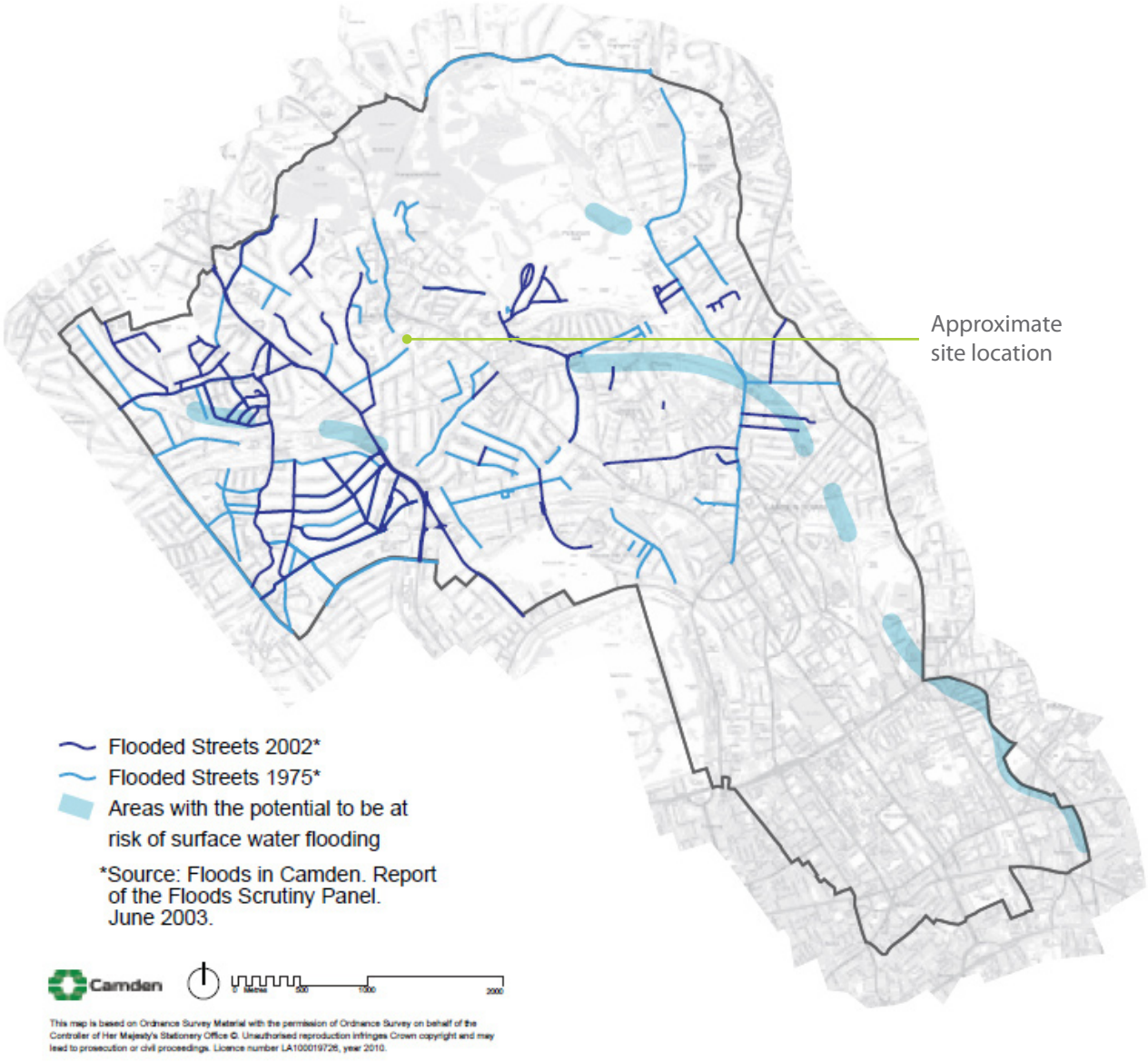
Example of woodland garden planted by Tom Stuart-Smith Ltd

Biodiverse roof with a UK native species wildflower blanket (Bauder Xero Flor XF118)

Flooding

The proposed development will result in a net increase in permeable surface areas on site. The vegetated garden, as well as the rainwater harvesting system, will retain a notable proportion of rainfall. All hard surface areas will be made permeable to enable infiltration of rainwater into ground to minimise surface water runoff.

The Surface Water Flood Risk Potential map extracted from the Camden Core Strategy document shows that the site is not at risk of flooding (see below). A review of the Environment Agency online flood maps also indicate the site to be located in an area at low risk of flooding.



Sustainability Assessment Tools

Sustainability Standards

The residential component of this development will be assessed using Code for Sustainable Homes 2010 as required by planning Policy DP22.

The following section provides an overview of the Code for Sustainable Homes assessment tool and the pre-assessment scores.

Code for Sustainable Homes

The Code for Sustainable Homes is the national standard for the design and construction of sustainable homes for new residential developments. It was established by the government in close working consultation with the Building Research Establishment (BRE) and Construction Industry Research and Information Association (CIRIA). The Code measures the sustainability of a development against design categories, rating each dwelling individually.

Although the Code is currently voluntary, many councils are now setting Code levels as mandatory targets and it is likely to become a national requirement in the future.

Each standard requires new developments to gain credits by meeting sustainable design principles over nine key areas:

- Energy
- Water
- Materials
- Surface Water Run-Off
- Waste
- Pollution
- Health and Wellbeing
- Management
- Ecology

In order to meet Camden's planning policy DP22- Promoting Sustainable Design and Construction, the development will meet Code Level 4 by implementing the measures detailed. In addition, Camden stipulate in the CPG3- Sustainability planning guidance that dwellings should achieve at least 50% of un-weighted credits in the Energy and Water categories.

To promote sustainable design and construction, the development will aim to meet Code Level 4, by implementing the measures detailed.

Energy

ENE 1 Dwelling Emission Rate

The Dwelling Emission Rate (DER) is the estimated CO_2 emissions per m^2 per year ($kgCO_2/m^2/year$) for a development. It accounts for energy used in heating, fixed cooling, hot water and lighting. To achieve Code Level 4, the Code stipulates that CO_2 emissions must exceed Part L 2010 Building Regulations i.e the Dwelling Emission Rate (DER) should be at least 25% better than the Target Emission Rate (TER).

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 2009.

A preliminary SAP calculation was carried out to assess the potential CO_2 savings achieved through

- energy efficiency measures
- the efficient supply of energy
- renewable systems

A 25% reduction in regulated CO_2 is mandatory for the proposed dwelling to achieve Code Level 4. The preliminary calculations showed an improvement in CO emissions over Part L Building Regulations 2010, amounting to 59.5%.

Given the improvement in DER over TER, the development at 92 Fitzjohn's Avenue exceeds the mandatory credits within the Energy category in order to meet Code Level 4 and Camden's requirement.

ENE 2 Fabric Energy Efficiency (FEE)

An improvement in the building fabric efficiency will significantly reduce energy demand. This will be achieved through the adoption of high levels of insulation and good levels of air tightness. SAP calculations were based on a building fabric with low U-values and an air permeability rate of $5m^3/m^2$ at 50 Pa, thereby achieving a Fabric Energy Efficiency (FEE) of 59.42 $kWh/m^2/year$.

ENE 3 Energy Display Devices
Energy display devices will be installed in the 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 devices will provide information on current electricity and primary heating consumption data.

ENE 4 Drying Space
The proposed development will include provisions for external clothes drying, thereby reducing the amount of electricity consumed through the use a of tumble dryer. The dwellings will include at least 6m of external drying line located in the garden or courtyards.

ENE 5 Eco Labelled White Goods
92 Fitzjohn's Avenue will be supplied with an EU Energy Efficiency Labelling Scheme Leaflet, which provides guidance on the purchase on energy efficient white goods.

The dwelling will also be supplied with energy efficient white goods which meet the following standard:
Fridges and freezers or fridge freezers - A+
Washing machines and dishwashers - A
Tumble dryers or washer dryers - B

ENE 6 External Lighting
Energy efficient light fittings will be installed in the external spaces. 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 7 Contribution of Low or Zero Carbon Technologies
A feasibility study was carried out to determine the Energy Strategy for the proposed development. Photovoltaics, solar thermal panels and a GSHP were considered to be the most feasible low and zero carbon solutions. The total low and zero carbon reduction from these measures exceeds 15% to achieve maximum credits in this section.

ENE 8 Cycle Storage
Cycle spaces will be provided within the development for the occupants to reduce the frequency of short car journeys. The cycle storage will be adequately sized, secure and accessible to all residents, thereby achieving some credits in this category. At least four cycle spaces will be supplied.

ENE 9 Home Office
The proposed development will allow for a home office space comprising

- sufficient space for a chair, desk and bookshelf
- adequate ventilation
- an average daylight factor of 1.5%
- 2 No. double power sockets and
- 2 No. telephone sockets (or one telephone socket where broadband is provided)

Water

WAT 1 Indoor Water Use

The water category aims to reduce the consumption of potable water in the home from all sources. These are mandatory credits within Code for Sustainable Homes, with Level 3 and 4 setting an upper limit of 105 litres per person per day.

The proposed dwellings aim to reduce water consumption through the use of water efficient fittings, including dual flush toilet, water efficient shower heads and taps. The average capacity and maximum flow rates of the water fittings are listed below.

It is estimated that the proposed residential development will achieve a water consumption rate of 104.6 litres/person/day, meeting the mandatory target for Code Level 4.

WAT 2 Outdoor Water Use

A correctly specified and sufficiently sized rainwater harvesting system will be implemented to collect rainwater from impermeable roof spaces for landscape irrigation.

Estimated Water Consumption

	Residential Units	
Fitting	**Average capacity/Flow rate**	**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	4 litres per min	7.9
Bath	180L to overflow	19.8
Shower	8 litres per min	34.96
Washing machine	8.17 L per kg of dry load	17.16
Dishwasher	1.25L per place setting	4.5
Net internal water consumption		114.96
Normalisation factor		0.91
Total CfSH		104.6

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

At least 50% 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.

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.

Surface Water Run-off

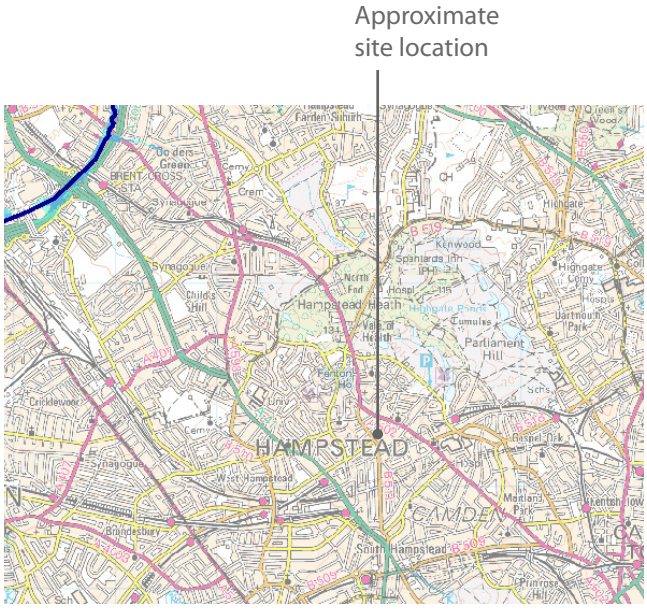
SUR 1 Surface Water Run-off

The aim of this category is to avoid, reduce and delay the discharge of rainfall run-off to watercourses and public sewers using sustainable drainage systems (SuDS).

The development at 92 Fitzjohn's Avenue will meet the mandatory requirement in this category, where the peak rate and annual volume of surface water run-off will be no greater for the site post-development in comparison to its pre-development condition. In addition, SuDs measures will be employed where possible, such as the installation of a rainwater collection system. Therefore, surface water runoff is expected to be minimal.

SUR 2 Flood Risk

The Environment Agency flood map shows that there is low risk of flooding on site. A site specific flood risk assessment will be undertaken to confirm this. Precautions will be taken to reduce the risk of flooding on site.



Environmental Agency map showing low flood risk

Waste

WAS 1 Household Waste

- Non-recyclable: External space will be allocated for non-recyclable household waste, this will be collected by the Local Authority
- Recyclable: A Local Authority Collection Scheme will be in operation for the collection of recyclable household waste, and at least three separate bins will be provided with a total capacity of 30 litres. Each bin will have a capacity of at least 7 litres and be located in the kitchen.

WAS 2 Construction 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

Additional credits have been taken into account whereby 85% of non-hazardous waste will be diverted from landfill. Details of the SWMP will be developed at a later stage, prior to construction.

WAS 3 Composting

A compost bin will be provided in a suitable place in the garden. This will allow the residents to recycle their vegetable and garden waste on site.

Internal waste storage and separation

Pollution

POL 1 Global Warming Potential (GWP) of Insulants

Global warming potential (GWP) is a measure of how effective a gas is at preventing the passage of infrared radiation. Blowing agents, used in the production of insulation, are a common source of gases with high GWPs.

The development will specify insulation materials that have a Global Warming Potential (GWP) of less than 5 to achieve the maximum credits in this category.

POL 2 NOx Emissions

This section aims to reduce the release of nitrogen oxide (NOx) into the atmosphere. Space heating and hot water requirements will be met through an efficient Ground Source Heat Pump system that utilises grid electricity. The opportunity for reduction in NOx emissions at source of electricity generation is limited.

Compost bin to be placed in garden

Health and Wellbeing

HEA 1 Daylighting

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

The development will aim to achieve average daylight factors of 2% for kitchen, 1.5% for dining room. Living rooms and home office. In addition, the above rooms will also aspire to have 80% of the working pane with direct light from the sky to maximise the number of credits gained in this section.

HEA 2 Sound Insulation

The development is a detached house and therefore the sound requirements will be met by default as there are no adjoining neighbours for sound transmission.

HEA 3 Private Space

The proposed dwelling will include generously sized gardens. The inclusion of outdoor space in this development will help improve the health and well-being of occupants.

HEA 4 Lifetime Homes

The dwelling will be compliant with all 16 principals of Lifetime Homes, ensuring it is easily adaptable for future use.

Management

MAN 1 Home User Guide

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

MAN 2 Considerate Constructors Scheme

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 at significantly beyond best practice, with a scheme score of between 32 and 40 and at least a score of 4 in each section.

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 production of CO_2 and the consumption of water associated with 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.

This application is accompanied by a Construction Management Plan which contains more detail of site impacts during construction.

MAN 4 Security

The development will meet the requirements of 'Secured by Design' Sections 1 and 2 through consultation with an Architectural Liaison Officer or Crime Prevention Design Advisor.

Ecology

ECO 1 and 3 Ecological Assessment

The development is located on a developed site likely to be with ecological value. A ecological assessment will be carried out to confirm this.

A landscaped gardens will be included in the development, with existing features of ecological value being retained where possible. A biodiverse roof with a UK native species wild flower blanket will also be installed on part of the roof to promote biodiversity on site.

ECO2 Ecological enhancement

A suitable qualified ecologist will be appointed for the development. All key recommendations and 30% of additional recommendations to positively enhance the ecology of the site will be adopted.

ECO 4 Change in Ecological Value of the Site

It is anticipated that planting of native species at the landscaped gardens will result in minor

Biodiverse roof

Proposed roof plan for 92 Fitzjohns Avenue with biodiverse roof

Code for Sustainable Homes Pre-Assessment Results

A Code for Sustainable Homes pre-assessment was carried out for the proposed dwelling at 92 Fitzjohn's Avenue, using the targets set by the client and project team. This reflects the client's and project team's commitment in adopting a range of sustainability measures over the life-cycle of the development.

The following table summarises the number of credits achieved in each of the Code categories, using the Stroma Core software. The proposed development achieves a total of 70.74 credits, which exceeds Code level 4. Over 50% of the credits in the Energy and Water categories will be achieved.

				Score Assessment		
92 Fitzjohn's Avenue		Credit Score	Credits Available	Sub Total	Weighting Factor	Points Score
Energy & CO2 Emissions	ENE 1 Dwelling Emission Rate	6.0	10	21.1	36.4%	24.78
	ENE 2 Fabric Energy Efficiency	3.1	9			
	ENE 3 Energy Display Device	2	2			
	ENE 4 Drying Space	1	1			
	ENE 5 Energy Labelled White Goods	2	2			
	ENE 6 External Lighting	2	2			
	ENE 7 Low or Zero Carbon Energy Technologies	2	2			
	ENE 8 Cycle Storage	2	2			
	ENE 9 Home Office	1	1			
Water	WAT 1 Internal Water Use	3	5	4	9%	6.00
	WAT 2 External Water Use	1	1			
Materials	MAT 1 Environmental Impact of Materials	8	15	12	7.2%	3.60
	MAT 2 Responsible Sourcing (Basic Building Elements)	3	6			
	MAT 3 Responsible Sourcing (Finishing Elements)	1	3			
Surface Water Run-off	SUR 1 Management of Surface Water Run-Off from Site	0	2	2	2.2%	1.10
	SUR 2 Flood Risk	2	2			
Waste	WAS 1 Household Waste Storage and Recycling Facilities	4	4	8	6.4%	6.40
	WAS 2 Construction Site Waste Management	3	3			
	WAS 3 Composting	1	1			
Pollution	POL 1 Global Warming Potential of Insulants	1	1	1	2.8%	0.70
	POL 2 NOx Emissions	0	3			
Health & Wellbeing	HEA 1 Daylighting	2	3	11	14%	12.83
	HEA 2 Sound Insulation	4	4			
	HEA 3 Private Space	1	1			
	HEA 4 Lifetime Homes	4	4			
Management	MAN 1 Home User Guide	3	3	9	10%	10.00
	MAN 2 Considerate Constructors Scheme	2	2			
	MAN 3 Construction Site Impacts	2	2			
	MAN 4 Security	2	2			
Ecology	ECO 1 Ecological Value of Site	0	1	4	12%	5.33
	ECO 2 Ecological Enhancement	1	1			
	ECO 3 Protection of Ecological Features	1	1			
	ECO 4 Change of Ecological Value of Site	2	4			
	ECO 5 Building Footprint	0	2			
	Level Achieved:	**4**		**Total Points Scored:**		**70.74**