Millington Road

Energy and Sustainability Statement

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Prepared by: Jess James

JAWSustainability

Contents

Executive Summary

This energy strategy has been prepared for the development at Millington Road. The development consists of the construction of 131 new build residential units, with associated refuse areas, cycle storage, parking and landscaping.

This report demonstrates how the proposed development addresses local planning policies relating to energy and sustainability. The strategy for the development is to utilise a centralised gas boiler system for the flats. A gas system has been specified rather than an electric heat pump system due to a lack of power supply in the area. The West London area currently has issues relating to the national grid. Upgrades to the network are required to reinforce it before it will be possible to provide power to any site above 250kVa. An application for a larger power supply to this site has been denied. A heat pump based system would require a 500kVa supply.

The proposed system results in a lower saving than required but is an insurmountable issue. The centralised energy system that is specified will futureproof the development to decarbonise in the future either by connection to district heating or replacement with lower carbon energy sources once additional power is available. PV panels have also been incorporated. The design team have undertaken all reasonable endeavours to achieve the maximum carbon savings.

Following the energy hierarchy, passive design measures, energy efficient equipment have shown an improvement of 15.3% improvement over Part L for the development. The heating and cooling hierarchies have also been followed. A payment of £343,364 is proposed to offset the shortfall to zero carbon.

1 Introduction

This energy strategy has been prepared for the development at Millington Road. The development consists of the construction of 131 new build residential units, with associated refuse areas, cycle storage, parking and landscaping.

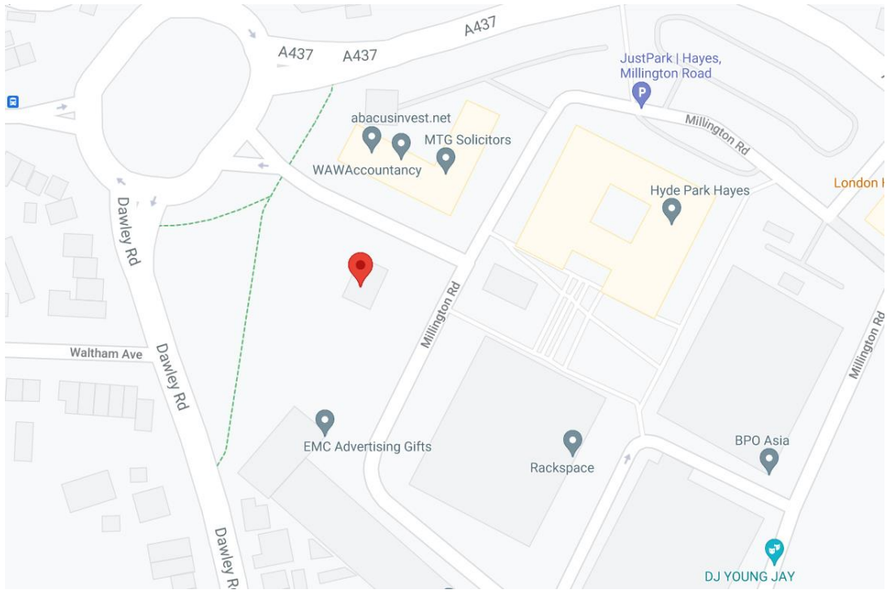


Figure 1-1 121 Millington Road © Google Maps

This statement summarises the sustainable design and construction measures that have been incorporated into the project in order to meet the sustainability requirements of the London Borough of Hillingdon and the London Plan.

1.1 Assessment approach

This report summarises the work undertaken to support the development of an energy strategy for the new development, following the energy hierarchy 'Be Lean, Be Clean, Be Green and Be Seen'.

Standard Assessment Procedure for the Energy Rating of Dwellings (SAP) calculations have been carried out for the residential units. These are used to assess the impact on energy demand and CO_2 emissions of improvements through the hierarchy and demonstrate the most appropriate solution for the development to meet the relevant planning requirements.

2 Policy

2.1 London Borough of Hillingdon Local Plan

Policy DMEI 2: Reducing Carbon Emissions

A) All developments are required to make the fullest contribution to minimising carbon dioxide emissions in accordance with London Plan targets.
B) All major development7 proposals must be accompanied by an energy assessment showing how these reductions will be achieved.
C) Proposals that fail to take reasonable steps to achieve the required savings will be resisted. However, where it is clearly demonstrated that the targets for carbon emissions cannot be met onsite, the Council may approve the application and seek an off-site contribution to make up for the shortfall.

Policy DMEI 3: Decentralised Energy

A) All major developments are required to be designed to be able to connect to a Decentralised Energy Network (DEN).
B) Major developments located within 500 metres of an existing DEN, and minor new-build developments located within 100 metres, will be required to connect to that network, including provision of the means to connect to that network and a reasonable financial contribution to the connection charge, unless a feasibility assessment demonstrates that connection is not reasonably possible.
C) Major developments located within 500 metres of a planned future DEN, which is considered by the Council likely to be operational within 3 years of a grant of planning permission, will be required to provide a means to connect to that network and developers shall provide a reasonable financial contribution for the future cost of connection and a commitment to connect via a legal agreement or contract, unless a feasibility assessment demonstrates that connection is not reasonably possible.
D) The Council will support the development of DENs and energy centres in principle, subject to meeting the wider policy requirements of this plan and in particular on design and air quality.

2.2 The London Plan Policies on Energy

Policy SI 2 Minimising greenhouse gas emissions

A Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:

1) be lean: use less energy and manage demand during operation
2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
4) be seen: monitor, verify and report on energy performance.

B Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.

C A minimum on-site reduction of at least 35 per cent beyond Building Regulations156 is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:

1) through a cash in lieu contribution to the borough's carbon offset fund, or
2) off-site provided that an alternative proposal is identified and delivery is certain.

D Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.

E Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.

F Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

Policy SI 3 Energy infrastructure

A Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.

B Energy masterplans should be developed for large-scale development locations (such as those outlined in Part A and other opportunities) which establish the most effective energy supply options. Energy masterplans should identify:

1) major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
2) heat loads from existing buildings that can be connected to future phases of a heat network
3) major heat supply plant including opportunities to utilise heat from energy from waste plants
4) secondary heat sources, including both environmental and waste heat
5) opportunities for low and ambient temperature heat networks
6) possible land for energy centres and/or energy storage
7) possible heating and cooling network routes
8) opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
9) infrastructure and land requirements for electricity and gas supplies
10) implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector
11) opportunities to maximise renewable electricity generation and incorporate demand-side response measures.

C Development Plans should:

1) identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure
2) identify existing heating and cooling networks, identify proposed locations for future heating and cooling networks and identify opportunities for expanding and inter-connecting existing networks as well as establishing new networks.

D Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:

1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:

    a) connect to local existing or planned heat networks
    b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
    c) use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network)
    d) use ultra-low NOx gas boilers
2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality

3) where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date.

E Heat networks should achieve good practice design and specification standards for primary, secondary and tertiary systems comparable to those set out in the CIBSE/ADE Code of Practice CP1 or equivalent.

Policy SI 4 Managing heat risk

A Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.

B Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:

1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
2) minimise internal heat generation through energy efficient design
3) manage the heat within the building through exposed internal thermal mass and high ceilings
4) provide passive ventilation
5) provide mechanical ventilation
6) provide active cooling systems.

3 Energy Strategy

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

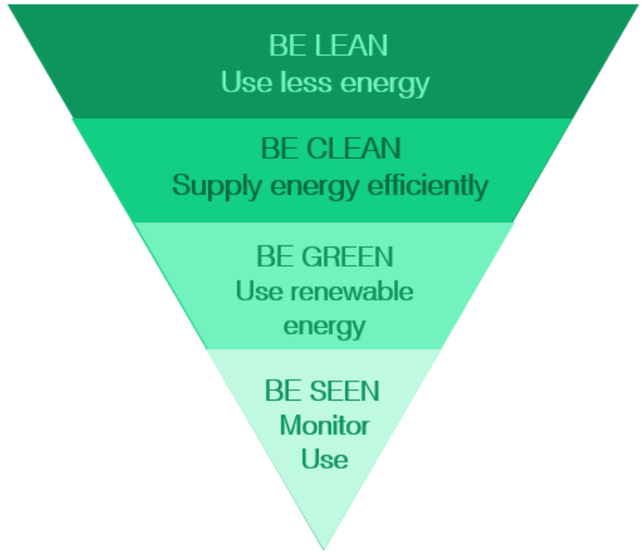


Figure 3-1 The Energy Hierarchy

The energy consumption and carbon emission figures within this report have been calculated using the approved Standard Assessment Procedure for the Energy Rating of Dwellings (SAP).

3.1 Energy Targets

In line with the London Plan, there is a target of zero carbon, with at least a 35% reduction over Part L 2013 on site. Table 3-1 below details the energy and carbon breakdown of the Part L target emission rate. These have been calculated using the SAP10 carbon factors.

Gas (kWh/yr)			Gas CO2 (kg/yr)	Electricity (kWh/yr)			Electricity CO2 (kg/yr)		
Space Heating	Hot Water	Total		Pumps & Fans	Lighting	Total		Total Energy	Total CO2
327,135	295,523	622,659	130,758	9,900	39,420	49,320	11,491	671,978	142,250

Table 3-1 Target regulated energy demand and carbon emissions per energy source

3.2 Be Lean

As part of the Be Lean approach, passive design measures have been considered throughout the pre-planning stage to reduce initial energy demand.

Solar Gain Control and Daylight

Solar gains are a passive form of heating from the sun's radiation and are beneficial to a building during winter months as they provide an effective source of heat and reduce internal heating requirements. However, summer months they must be controlled in order to mitigate the risk of overheating. They can be controlled through glazing and shading design in order to allow low level winter sun to enter the building and to limit access to high level summer sun.

The glazing strategy design has carefully considered orientation and window size in order to maximise daylight while controlling excessive solar gains. Glazing will incorporate low emissivity coatings to limit overheating without compromising light transmittance.

Overheating

The London Plan overheating checklist has been used to assess the risk of overheating in the flats.

Section 1 – Site features affecting vulnerability to overheating		Yes or No
Site location	Urban – within central London[29] or in a high density conurbation	Yes
	Peri-urban - on the suburban fringes of London[30]	No
Air quality and/or Noise sensitivity - are any of the following in the vicinity of buildings?	Busy roads / A roads	Yes
	Railways / Overground / DLR	Yes
	Airport / Flight path	No
	Industrial uses / waste facility	No
Proposed building use	Will any buildings be occupied by vulnerable people (e.g. elderly, disabled, young children)?	Yes
	Are residents likely to be at home during the day (e.g. students)?	No
Dwelling aspect	Are there any single aspect units?	Yes
Glazing ratio	Is the glazing ratio (glazing: internal floor area) greater than 25%?	No
	If yes, is this to allow acceptable levels of daylighting?	N/A
Security - Are there any security issues that could limit opening of windows for ventilation?	Single storey ground floor units	No
	Vulnerable areas identified by the Police Architectural Liaison Officer	No
	Other	N/A

[29] Urban - as defined in CIBSE Guide TM49. Broadly equivalent to Central Activities Zone and Inner London areas in Map 2.2 of the London Plan

[30] Peri-urban – as defined in CIBSE Guise TM49. Broadly equivalent to Outer London areas in Map 2.2 of the London Plan

Section 2 – Design features implemented to mitigate overheating risk		Please Respond
Landscaping	Will deciduous trees be provided for summer shading (to windows and pedestrian routes)?	No
	Will green roofs be provided?	Yes
	Will other green or blue infrastructure be provided around buildings for evaporative cooling?	No
Materials	Have high albedo (light colour) materials been specified?	Yes
Dwelling aspect	% of total units that are single aspect	3.8%
	% single aspect with N orientation	0%
	% single aspect with E orientation	0%
	% single aspect with S orientation	0%
	% single aspect with W orientation	3.8%
Glazing ratio - What is the glazing ratio (glazing; internal floor area) on each facade?	N	10%
	E	8%
	S	4%
	W	11%
Daylighting	What is the average daylight factor range?	
Window opening	Are windows openable?	Yes
Window opening	What is the average percentage of openable area for the windows?	50%
Window opening - What is the extent of the opening?	Fully openable	Yes
	Limited (e.g. for security, safety, wind loading reasons)	No
Security	Where there are security issues (e.g. ground floor flats) has an alternative night time natural ventilation method been provided (e.g. ventilation grates)?	N/A
Shading	Is there any external shading?	Yes overhanging balconies
	Is there any internal shading?	No
Glazing specification	Is there any solar control glazing?	Yes, low emissivity glazing is specified
Ventilation - What is the ventilation strategy?	Natural – background	Yes
	Natural – purge	No
	Mechanical – background (e.g. MVHR)	Yes
	Mechanical – purge	Yes
	What is the average design air change rate	6
Heating system	Is communal heating present?	Yes
	What is the flow/return temperature?	<45 °C
	Have horizontal pipe runs been minimised?	Yes
	Do the specifications include insulation levels in line with the London Heat Network Manual[31]	Yes

[31] http://www.londonheatmap.org.uk/Content/uploaded/documents/LHNM_Manual2014Low.pdf

The impact of solar gains has been analysed as part of the SAP calculations, taking into account the ventilation strategies and the risk of solar overheating has been concluded to be slight, when measured against the Part L1A criteria.

Following the overheating checklist, and results of the SAP assessment, the risk over solar overheating is minimised. Whilst Mechanical Ventilation with Heat Recovery is provided to allow for ventilation during times when windows need to remain closed due to external elements such as noise or air quality, there is also a natural ventilation strategy possible and the majority of units have dual aspect to allow for cross ventilation.

Windows are specified to incorporate low emissivity coatings to limit overheating while ensuring adequate daylight. External shading has been designed into the façades.

Deck corridors between units are open and naturally ventilated minimising the chances of facing units overheating.

The impact of solar gains has been analysed as part of the SAP calculations, taking into account the ventilation strategies and the risk of solar overheating has been concluded to be slight, when measured against the Part L1A criteria.

Building Fabric

Designing an efficient thermal envelope will greatly reduce the need for space heating and cooling as heat transmittance through the thermal elements is reduced.

Low air permeability rates will also reduce heating and cooling energy demand by reducing the volume of air that can penetrate the building.

As part of a 'fabric first' approach, the building fabric has been carefully considered and specified to meet or exceed current Building Regulations minimum requirements, as detailed in table 3-1 below.

Fabric Component	Residential Specification
External Walls	0.15 W/m^{2}K
Stairwell/Corridor Wall	0.2W/m^{2}K
Roof	0.11 W/m^{2}K
Ground/ Exposed Floor	0.11 W/m^{2}K
Party Walls	Fully filled cavity with edge sealing
Windows	1.2 W/m^{2}K G-value 0.4
External Doors	1.2 W/m^{2}K
Air Tightness	3m^3/m^2/h
Thermal Bridging	ACD Bridges

Table 3-1 Proposed Be Lean passive design measures

With regards to party walls, to reach the required standards, these must be fully filed. Partially filled cavities will not comply.

Thermal bridging

Non-repeating thermal bridges at junctions will be designed carefully in order to ensure that they perform better than typical constructions. This will be achieved through the use of Accredited Construction Details (ACDs) for heat loss junctions such as corners, external wall junctions with floors and party walls.

Building Services

Services have been specified to maximise efficiency therefore reducing energy used. Table 3-2 shows the proposed services strategy and energy efficiency measures for the development.

Services Component	Residential Specification (flats & student accommodation)
Space Heating & hot water	Communal gas boiler 95% Charging linked to use off heat, programmer & TRVs U/F Heating
Heating Controls	Time and temperature zone control
Ventilation	MVHR 89% efficient SFP 0.6 w/l/s Rigid Duct/ Insulated Approved Installation
Lighting & Controls	100% low energy lighting

Table 3-2 Proposed energy efficient design measures

The breakdown of carbon and energy use has been identified for the site. Table 3-4 shows the breakdown of carbon and energy use once the strategies proposed at the be lean are incorporated.

Gas (kWh/yr)			Gas CO2 (kg/yr)	Electricity (kWh/yr)			Electricity CO2 (kg/yr)	Total Energy	Total CO2
Space Heating	Hot Water	Total		Pumps & Fans	Lighting	Total			
219,389	298,656	518,044	108,789	27,642	39,369	67,011	15,614	585,056	124,403

Table 3-4 Estimated regulated energy demand and carbon emissions per energy source

Carbon Savings

Tables 3-7 demonstrates the percentage improvement over the notional baseline levels for the be lean stage for each of the use types.

Residential			
Energy Hierarchy stage	CO_2 Emissions (T/yr)	CO_2 Savings (T/yr)	% Saving
Building Regulations 2013 Baseline	142.25		
Be Lean	124.40	17.85	12.55%

Table 3-7 improvements over Part L

The development has incorporated thermally efficient fabric and passive design measures to generate savings at the Be Lean stage. The flats achieve an 12.55% improvement over Part L. This exceeds the 10% carbon reduction from passive design measures required by the London plan and the Borough of Hillingdon. To achieve this best practice U-values have been utilised as have accredited construction details for non-repeating thermal bridges, it is concluded that the design team have attained the greatest energy and carbon savings through passive design measures that is both technically and financially viable.

3.3 Be Clean

As part of the Be Clean approach, the use of energy efficient equipment, heat networks and community heating have been considered.

District Energy Systems

The nearest proposed heat network shown on the london heat map (https://maps.london.gov.uk/heatmap) is the The Old Vinyl Factory Network, this is however located over 400m from the site (Figure 3-3) and as such is too far away for the development to reasonably connect and connection would include crossing a railwayline.

None the less, the site is located in a heat network priority area and as such in order to meet the requirements of the Hillingdon Local Plan and the London plan, the development has been designed to utilise a centralised heating and hot water system which in turn future proofs the development by allowing for easier connection to any future local networks within range of the development site. Contact will be made with the Heat Network to discuss if a future connection is possible.

Figure 3-3 Distance to the nearest heat network (https://maps.london.gov.uk/heatmap)

Efficient systems for energy delivery have also been investigated. At the scale of this development, Combined Heat and Power (CHP) systems are not viable. CHP requires a high base energy demand load in order to operate efficiently. It is usually more suited to hotel or hospital schemes which have a high hot water demand, or very large residential schemes incorporating hundreds of units.

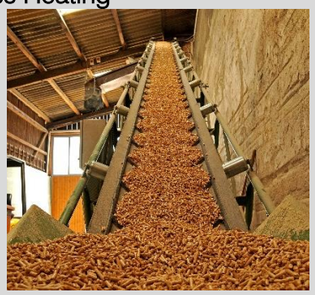
The development will incorporate a community heating system, with a single energy centre. This will futureproof the development for connection to any heat networks that become available in the future. Details of this energy centre can be found in the most recent issue of the drawing package provided.

Carbon Savings

As the district heating and CHP are not viable options for a project of this scale, there are no further savings to be made at the be clean stage.

3.4 Be Green

At the Be Green stage, renewable technologies are investigated. Table 3-3 considers the feasibility of renewable energy technologies for the scheme.

LZC Technologies	Description	Noise	Visual impact	Internal Space	External Space	Capital Cost	Maintenance	Feasibility	
Solar Thermal Collectors 	Solar thermal collectors can be used to provide hot water using the irradiation from the sun. They can generally provide approx. 50% of the hot water demand	🟢	🟡	🟢	🟡	🔴	🟡	There are areas of flat roof that can incorporate solar technologies. However, carbon savings are quite low and it is quite a high cost technology.	×
Solar Photovoltaic Panels 	Solar PV panels generate electricity from the sun's energy. They should be installed within 90° of due south ideally at a 30° angle. The electricity can be used to supply the landlords load.	🟢	🟡	🟢	🟡	🟡	🟡	There are areas of flat roof that can incorporate solar technologies. Solar PV is ideal for making carbon savings while being a simple technology.	✓
Biomass Heating 	Solid, liquid or gaseous fuels derived from plant material can provide boiler heat for space and water heating A biomass boiler would supplement a standard gas heating system so some of the cost may be offset through money saved on using smaller traditional boilers reliability of fuel access/supply can be a problem	🟡	🟢	🔴	🟡	🔴	🔴	Biomass is not considered feasible for this development due to issues with fuel storage, access for delivery vehicles and local NO_x emissions	×

Wind Turbines 	Vertical and horizontal axis wind turbines enable electricity to be generated using the power within the wind Not suitable for urban environments due to low wind conditions and obstructions	🔴	🔴	🟢	🔴	🔴	🟡	This development is in an urban environment and so a wind turbine will not generate much energy	×
Ground Source Heat Pumps (GSHP) 	Utilising horizontal loops or vertical boreholes, GSHP make use of the grounds almost constant temperature to provide heating and/or cooling using a heat exchanger connected to a space/water heating delivery system Optimum efficiency with underfloor heating systems	🟡	🟢	🟡	🟡	🔴	🟡	GSHP are not a feasible option as there is not enough power supply available for the site.	×
Air Source Heat Pumps (ASHP) 	Air Source Heat Pumps extract latent energy from the external air in a manner similar to ground source heat pumps Optimum efficiency with underfloor heating systems	🟡	🟡	🟡	🟡	🟡	🟡	Air source heat pumps are not a feasible option as there is not enough power supply available for the site.	×

Table 3-3 Feasibility of LZC technologies for the development

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Renewable systems

The feasibility study has identified solar PV as the most appropriate technology for the development.

System	Residential Specification
Photovoltaic panels	Peak Power – 20.5 kWp Orientation – SE/SW Angle of elevation – 30˚ Panel specification – Min 20% efficiency Approx. no of panels – 63

Table 3-4 specification of LZC technology

ASHP System

An initial design for the centralised ASHP system has been produced. This will be developed in more details as the design progresses. The Daikin Altherma system has been used as an example system at this stage, and the same or better will be specified. This is proposed to be utilised through an ambient loop cascade system. Please refer to the ASHP specification document for further information.

Photovoltaic Systems

PV arrays are specified as above. This array utilises the maximum available rooftop capacity. The only sections of the developments roof not utilised for PV arrays are required for roof top ASHP compressors and rooftop amenities areas.

3.5 Energy and Carbon Savings

Energy Use

The breakdown of carbon and energy use has been identified for the site. Table 3-4 shows the breakdown of carbon and energy use once the strategies proposed in this report are incorporated.

Gas (kWh/yr)			Gas CO2 (kg/yr)	Electricity (kWh/yr)				Electricity CO2 (kg/yr)	Total Energy	Total CO2
Space Heating	Hot Water	Total		Pumps & Fans	Lighting	PV	Total			
219,389	298,656	518,044	108,789	27,642	39,369	-16,843	50,168	11,689	568,213	120,479

Table 3-5 Estimated regulated energy demand and carbon emissions by end use

Carbon Savings

Table 3-5 and Figure 3-5 demonstrate the percentage improvement over the notional baseline levels for the development.

Residential			
Energy Hierarchy stage	CO_2 Emissions (T/yr)	CO_2 Savings (T/yr)	% Saving
Building Regulations 2013 Baseline	142.25		
Be Lean	124.40	17.85	12.55%
Be Clean	124.40	0.00	0.0%
Be Green	120.48	3.92	2.76%
Total Cumulative Savings		21.77	15.30%

Table 3-6 Carbon emissions reductions over part L by energy stage

Carbon Offset Payment

The development has achieved a 63.5% improvement over Part L for the development. In line with the London Plan carbon reduction requirements, there is a target of zero carbon, which can be achieved through an offset payment when there is a shortfall on site. This calculation is detailed below.

Shortfall on zero carbon		
Carbon emissions (tonnes / annum)	30 year carbon emissions	Offset payment (£95/tonne)
120.48	3614	£ 343,364

Table 3-7 30 year carbon emissions and estimated carbon offset payment

3.6 Be Seen

All major plant will be fitted with meters to allow remote monitoring of energy used by the communal heating systems and electrical distribution boards. A contract will be put in place to monitor the readings so that they can be compared with the predicted energy performance, and this information will be reported.

The performance of the heat pump system will be monitored as part of this process, to ensure predicted energy uses and savings are achieved. Where issues are found, the system can then be recommissioned to improve operation where possible.

4 Sustainability Strategy

Solar Gain Control and Daylight

Solar gains are a passive form of heating from the sun's radiation and are beneficial to a building during winter months as they provide an effective source of heat and reduce internal heating requirements. However, summer months they must be controlled in order to mitigate the risk of overheating. They can be controlled through glazing and shading design in order to allow low level winter sun to enter the building and to limit access to high level summer sun.

The glazing strategy design has carefully considered orientation and window size in order to maximise daylight while controlling excessive solar gains. Glazing will incorporate low emissivity coatings to limit overheating without compromising light transmittance.

4.1 Water efficiency

Water fittings will be specified with the following or similar flow rates to meet the target water consumption of 105 l/p/day for the residential aspect of the development:

- Wash basin taps – 6.5 l/min
- Showers – 7.5 l/min
- Bath – 120l to overflow
- Dishwasher - 1.2 l/place setting
- Washing machine - 9 l/kg load
- WC – 6/4 litre dual flush
- Kitchen taps – 6.5 l/min

Water meters will be installed to encourage residents to limit their consumption.

4.2 Materials

Materials will be specified to reduce the embodied carbon of the development, wherever possible. Demolition waste will be used as hardcore where appropriate.

Insulating materials will be specified to maximise thermal performance whilst still paying attention to the environmental impact of the materials used, by specifying mineral wool. If possible, materials with a high recycled content will be specified.

Responsible sourcing will also be pursued. All timber used on site during the construction phase and within the building will be from legal sources. Where possible, FSC or equivalent timber will be used. Sourcing of other materials will include products where the manufacturer employs an environmental management system such as ISO 14001 or BES 6001. Where possible, materials will be sourced locally.

Non-toxic materials will be used wherever possible, including the specification of products with low VOC content in line with European testing standards.

All the building elements will achieve high ratings on the BRE Green Guide to Specification. Materials will be specified to have a low embodied energy, taking into account whole life cycle analysis.

4.3 Waste Management and Construction

Construction site waste will be managed in such a way to reduce the amount of waste produced as much as possible, and the waste hierarchy will be followed. In addition, at least 85% of waste that does arise will be recycled using an external waste contractor.

Regular waste and recycling bins will be provided for separation of waste to facilitate recycling.

The contractor will enrol in the Considerate Contractors Scheme to ensure best practice construction standards are met during the build of the development.

4.4 Climate Change Adaptation

Tackling Increased Temperature and Drought

Windows will incorporate low emissivity coatings to reduce solar gain, and overhangs are built to some of the windows. Other than mandatory ventilation to meet AD Part F, the development utilises mechanical ventilation along with openable windows.

As described above in water consumption, measures have been put in place to reduce potable water use internally. There is limited planting associated with the development and this will all be specified to be drought resistant rely mainly on rainwater.

Flooding

The development is in flood Zone 1 (Figure 4-1) which means there is a Low Risk of Flooding. Please refer to the Flood Risk Assessment for details of measure taken.

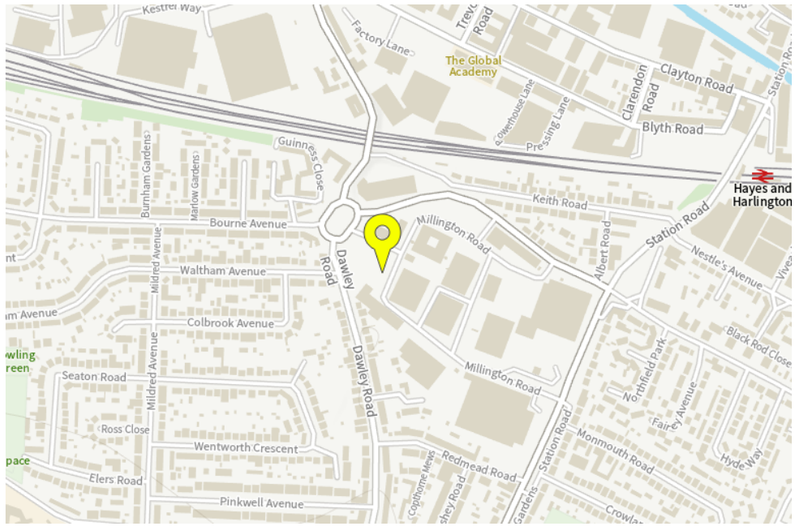

Figure 4-1 Millington Road Flood Risk Map

4.5 Pollution Management

Air Quality

The construction site will be managed in such a way that the environmental impact is minimised. This includes following best practice policies for dust pollution by using dust sheets, covering skips and damping down where appropriate.

Plant and machinery

All plant and equipment installed in the development will be appropriately sized and selected for efficiency in order to reduce greenhouse gas emissions.

All equipment will be frequently maintained to ensure it continues to run efficiently and cleanly. Insulating materials and heating systems will be specified to keep pollutants to a minimum. Insulation will have a low Global Warming Potential (GWP).

Noise

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

Light Pollution

100% of the proposed lighting will be provided by low energy light fittings specified to have a luminous efficacy greater than 40 lm/W. All external lighting will be adequately controlled to ensure that spaces are only lit out of daylight hours and when the area is occupied. As the proposed building use is residential; there will be no illuminated signage or uplighting incorporated. The proposed dwelling is in a highly urbanised location, and therefore will not significantly contribute to increasing the effects of light pollution.

4.6 Transport and Accessibility

Sustainable methods of transport have been prioritised, with a high amount of bike storage being provided. Please refer to the transport assessment for further details.

5 Conclusion

This energy strategy has been prepared for the development at Millington Road. The development consists of the construction of 131 new build residential units, with associated refuse areas, cycle storage, parking and landscaping.

The development employs an efficient building fabric, including well insulated walls and highly efficient glazing, efficient systems, air source heat pumps and PV Panels are specified to maximise carbon savings for the site.

At the be lean stage, this results in a 12.55% improvement over Part L for the development. The building fabric has been specified to be very efficient, while also ensuring non-combustible insulation is used. Additionally, the reduction in heating demand is balanced against reducing overheating.

The strategy for the development is to utilise a centralised gas boiler system for the flats. A gas system has been specified rather than an electric heat pump system due to a lack of power supply in the area. The West London area currently has issues relating to the national grid. Upgrades to the network are required to reinforce it before it will be possible to provide power to any site above 250kVa. An application for a larger power supply to this site has been denied. A heat pump based system would require a 500kVa supply.

The proposed system results in a lower saving than required but is an insurmountable issue. The centralised energy system that is specified will futureproof the development to decarbonise in the future either by connection to district heating or replacement with lower carbon energy sources once additional power is available. PV panels have also been incorporated. The design team have undertaken all reasonable endeavours to achieve the maximum carbon savings.

At the be green stage the overall results are a 15.3% improvement over Part L for the development respectively.

The development follows the energy hierarchy, heating hierarchy and cooling hierarchy.
The PV system is the largest that the roof can accommodate. The proposals therefore represent the best on site savings. The development will further achieve ‘zero carbon’ through an offset payment in line with the London Plan guidance.

The figures within this report are based on preliminary analysis only and further detailed studies will be required at the detailed design stage before specifying any of the proposed systems.

This report demonstrates how the proposed development addresses local planning policies relating to energy and sustainability. The strategy for the development is to utilise a centralised gas boiler system for the flats.