SUSTAINABILITY STATEMENT

INCLUDING RENEWABLE ENERGY CALCULATIONS

1-7 MILL LANE, NW6

FOR SLLB ARCHITECTS LTD.

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INTRODUCTION

This document was commissioned by SLLB Architects Ltd and written by Azita G. Dezfouli of ECD Project Services.

The proposed residential development is located at 1-7 Mill Lane and consists of 40no. units – 2no. houses, 20no. 2-bed, 14no. 1-bed and 4no. 3-bed flats in a five storey block.

This report reviews the current standing of this scheme, employing drawings, documents, verbal and available design information provided by SLLB Architects.

The purpose of this report is to provide general details of the Sustainability Strategies required to comply with the policy 4A.7 in the London Plan.

'Sustainability' section of Camden's pre-application meeting report, 01 May 2008:

Any scheme proposed for the site should be designed, built and managed with principles of an energy efficient building with low or zero carbon emissions. No information has been submitted to assess the sustainability credentials of the building and the following is a general guide only. In very broad terms, the Council will expect the following to be included:

- application to be accompanied by a full energy statement that establishes a baseline energy use, proposes measures to reduce energy consumption, incorporates energy efficient systems and 20% (the 10% expressed in the UDP has been superseded by policy 4A.7 in the London Plan) of energy use being derived from onsite renewable sources;
- a submission to demonstrate development to be meet Level 3 'Code for Sustainable Homes' with 60% of credits achieved in each of the energy and water sections and 40% in the materials and resources section;
- Incorporation of rain water/grey water recycling systems and a scheme for sustainable urban drainage; and
- Use of green/brown roofs where possible (see natural environment section above).

SUSTAINABILITY MEASURES

The current proposed development has achieved

- A score of 64.66% under Code for Sustainable Homes which is equivalent to Code Level 3
- 65.5% of credits under energy section
- 66.7% of credits under water section by the provision of internal potable use of less than 105 litres/person/day and rain water harvesting
- Greater than 25% improvement of DER over TER
- 20% of total energy demand for space/water heating by renewable or Low/Zero Carbon technologies

METHODOLOGY

The total delivered annual energy demand for lights, space and water heating of the dwellings has been calculated.

Calculations to establish the total heating energy requirement and the percentage contribution from renewable energy technology (a zero emission energy source) were carried out. This was done using the industry standard, developed by the Building Research Establishment (BRE). Data from the SAP assessments was used.

BACKGROUND

The Government's Standard Assessment Procedure (SAP) for Energy Rating of Dwellings 2005 edition was used to assess the Energy Performance of this development. The Standard Assessment Procedure (SAP) is adopted by Government as the UK methodology for calculating the energy performance of dwellings.

The calculation is based on the energy balance taking into account a range of factors that contribute to energy efficiency:

- Materials used for construction of the dwelling
- Thermal insulation of the building fabric
- Ventilation characteristics of the dwelling and ventilation equipment
- Efficiency and control of the heating system(s)
- Solar gains through openings of the dwelling
- The fuel used to provide space and water heating, ventilation and lighting
- Renewable (Low-Carbon) energy technologies

The current proposals have achieved greater than 25% improvement of DER over TER.

End-Terrace houses have a **DER** of 14.08 kg CO/m²/yr. This is 70.93% of the **TER** (19.85 kg CO/m²/yr). To achieve the Code Level 3, the **DER** should be at least 75% of the **TER**; therefore the above requirement has been met.

Mid-Floor 1-bed Flats have a **DER** of 13.76 kg CO/m²/yr. This is 66.63% of the **TER** (20.65 kg CO/m²/yr). Therefore the above requirement for these units has also been met.

All feasible intervention options for reduction of energy demand should be considered before the design of renewable energy technologies takes place. An appropriate Energy Strategy should ensure the energy needs are met in the most efficient way by:

1- Using less energy- through energy conservation.

2- Using Zero/Low Carbon energy and

3- Supplying energy efficiently.

The following issues have been taken into account for the NHER and SAP Assessments as stated in the Methodology above.

These issues follow Best Practice as stated in the Energy Efficiency Best Practice in Housing produced by the Energy Saving Trust (EST).

A.1 Building Fabric

The thermal properties of the Building Fabric are taken into account in order to improve the efficiency of the units over their whole life.

- U-values for the external envelope to be:
  a. Walls 0.20 W/m2K
  b. Roof 0.15 W/m2K
  c. Floors 0.15 W/m2K
  d. Windows and glazed doors 1.5 W/m2K with a BFRC rating of –16 Band C.
  e. Solid Doors 3.0 W/m2K
- The ground floor will be a solid floor above unheated basement.
  Edge insulation will be provided to reduce thermal bridging and to achieve the U-value stated above.
- All windows, glazed doors to be:
  a. Softwood timber;
  b. Draught-proofed, good sealed;
  c. Timer lintel
  d. Double glazed with 12mm gap between panes;
  e. Argon filled.
  f. Fitted with soft low- e coating.

g. Corrugated metal strip spacer

- Thermal Bridging:

The detail design will follow '**Accredited Construction Details**', as stated in Part L1A of Building Regulations. Bespoke details and thermal bridging calculations will follow BRE information paper IP 1/06, or BRE information paper IP 17/01, or as required by Building Control.

A.2 Ventilation

- Air Permeability / Air Tightness:

Pressure test will be carried out as stated in Part L1A of Building Regulations.

A design target of **5.0 m3/hm2** @ 50 PA will be specified, averaged over the surface area of the tested dwelling. This is line with EST Best Practice in Housing.

- Mechanical Ventilation with Heat Recovery (MVHR).

Heat recovery mechanical ventilation (MVHR) system will be provided to continually extract air from 'wet' rooms. The MVHR will have a fan power of 0.73 and Heat Exchanger efficiency of 86%. All specifications to comply with requirements stated for Best Practice in Housing on GPG 268/CE124 Energy Efficient Ventilation in Dwellings, published by the EST.

NB- To qualify as best practice standard, the whole system will have a specific fan power of 0.6W/l/s or less when running at each of its settings.

A.3 Heating System and Controls

- Primary Space heating:

i. Heating is provided by Exhaust air Heat Pumps to all units

ii. Controls will consist of a programmer and room thermostats.

- Water heating:
    i. There will be a hot water cylinder of 150litres.
    ii. The primary pipe work will be insulated.
    iii. The primary system will be pumped and wholly contained within the heated space.
    iv. The hot water will be independently programmed.
    v. The cylinder insulation to be spray foam, 80mm thick.
    vi. 2 m^2 flat plate solar collectors per dwelling

A.4 Internal Lighting

The scheme will have at least **40%** of dedicated low energy lamps specified in

- Main rooms such as the kitchen, living- dining room **and** hall/staircase.
- Secondary rooms such as bedrooms and study areas.

NB- A dedicated energy efficient light fitting must comprise of the lamp, control gear, and an appropriate housing, reflector, shade or diffuser. The fitting must be capable of only accepting lamps having a luminous efficacy greater than 40 lumens per circuit Watt. Tubular fluorescent and compact fluorescent lighting fittings would meet this requirement. Lighting fittings for GLS tungsten lamps with bayonet cap or Edison screw bases, or tungsten halogen lamps would not comply. Only fixed internal light fittings in a habitable room are to be included.

A.5 Appliances:

No white goods are to be provided but information on purchasing energy-efficient white goods to be provided to residents (such as DEFRA Leaflets, Energy Labels - Helping you make the right choice).

A.6 Thermal Mass

All of the proposed units are in compact grouped forms. The houses are arranged in a terrace form resulting in footprint being almost square ensuring minimum perimeter / internal area ratio; the flats are arranged in a four-storey block.

- The application is in outline with Landscaping as the reserved matter. So this performance standard would be subject to a planning condition.
- Existing trees will provide some wind sheltering, with further opportunities for planting within the landscaping. Especial attention will be made to ensure that the proposed properties are sheltered, from prevailing winds coming from the west.
- Careful species selection will avoid overshadowing by the proposed tree planting in the parking courtyard. The use of deciduous trees will minimise overshadowing in winter when the sun is at a low angle, and will thus maximise the opportunities for passive solar gains. In summer the leaves will provide valuable shade to prevent overheating.
- Careful species selection to be included, as part of the landscape proposals will include native species, which will attract local wildlife.

RENEWABLE ENERGY

NIBE Exhaust air Pumps are proposed to the site. This uses exhaust air as a heat source.

Hot water solar collectors are proposed to the site – $2m^2$ per dwelling

In order to calculate the energy savings by heat pumps, the total energy requirement has been calculated using the BRE-EcoHomes Methodology (SAP Assessments). One house (unit 8) and one flat (unit 12) are selected as a representative of all the units.

Unit 8:

The total energy load is calculated to be 9216.28 kWh/yr 3949.36. 1397.4 kWh/yr is saved by Exhaust air heat pumps and solar collectors. This is equal to 15.2% of energy demand.

Unit 8			
Energy Required	kWh/yr	Output from Solar Collectors	Saved by Heat Pumps
Space Heating	3956.94	668.4	729
Water Heating	2853.93		
Energy for pumps and fans	933.92		
Lighting	996.49		
Cooking	475		
Total	9216.28		kWh/yr
Energy Saved =	15.2%	Total Saved =	1397.4

Unit 12:

The total energy load is calculated to be 3920.66 kWh/yr 3949.36. 881.85 kWh/yr is saved by Exhaust air heat pumps and solar collectors. This is equal to 22.5% of energy demand.

Unit 12			
Energy Required	kWh/yr	Output from Solar Collectors	Saved by Heat Pumps
Space Heating	865.31	570.85	311
Water Heating	1752.11		
Energy for pumps and fans	432.29		
Lighting	395.95		
Cooking	475		
Total	3920.66		kWh/yr
Energy Saved =	22.5%	Total Saved =	881.85

Considering the proportion of the number of houses to flats, it is estimated that more than **20% of total energy demand** will be saved by renewable and Low carbon technologies.

CARBON

The carbon emissions rate is calculated using the BRE-EcoHomes Methodology (SAP Assessments). Worst case units for each house type are assessed as a representative of all the units.

Unit 8: The house has a DER value of 14.08 kgCO/m²/yr, TER is 19.85 kg CO /m²/yr for this property. Therefore there is a 29.07% improvement of DER over TER.

Unit 12: The flat has a DER value of 13.76 kgCO/m²/yr, TER is 20.65 kg CO /m²/yr for this property. Therefore there is a 33.37% improvement of DER over TER.

Therefore it is estimated that the whole development will achieve an improvement of greater than 25% over TER.

D. BUILDING MATERIALS

The mandatory requirement is met by provision of at least three of five key building elements to achieve a Green Guide rating of A+ to D.

Roof:	Sedum roof **(B rated)** - TBC
External Wall:	Brick on timber frame external walls **(A rated)**
Internal Walls:	Timber Studwork partitions **(A rated)**
Ground Floor:	Screed on beam and dense block ground floor **(B rated)**
Upper Floors:	Beam & block Upper (A rated)
Windows:	Hardwood timber frame window High **(A+ rated)**