Mayfield Morrison Limited

Sustainability Statement

Replacement Dwelling

71 Avenue Road

London

NW8 6HP

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Introduction

Mayfield Morrison Ltd have been appointed to produce an initial Sustainability Statement to support a planning application for a replacement dwelling at 71 Avenue Road, London, NW8 6HP.

Camden Council's planning policies encourage and require sustainable design and construction under the umbrella of the London Plan.

Policy CC1 requires new dwellings to provide a 19% reduction in CO2 emissions relative to a dwelling that just meets the 2013 Building Regulations.

Water usage is required to be limited to 105 litres per person per day plus 5 litres per person per day for external water use.

The carbon reduction methodology follows the energy hierarchy 'be lean, be clean, be green, be seen'.

To demonstrate the CO2 reduction, it is first necessary to establish the notional building CO2 emissions, which gives the baseline figure for a dwelling that just complies with the 2013 building regulations. This uses gas as the fuel for space heating and domestic hot water.

For the 'be lean and be clean' stage, the calculation is rerun with the fabric performance of the dwelling improved and efficient building services specified. This stage also uses mains gas as the fuel and no renewable energy technologies are included. This provides improvements over the notional building which reduces the renewable energy generation required to help meet the overall 19% CO2 reduction.

Lastly, the energy generation from the supply of renewable and low carbon energy is calculated which must result in an overall 19% reduction of the CO2 emissions for the dwelling.

To produce the results, approved SAP 2012 software has been used, with the relevant figures extracted into the table below and the full calculation reports appended for information.

On this project, improvements to the baseline dwelling include improved U values well below notional maximum values for the walls, roofs, heat loss floors and external openings.

Be Lean and Be Clean dwelling specification

Element	Specification
Walls	0.18 W/m^{2}K
Roofs	0.13 W/m^{2}K
Floors	0.15 W/m^{2}K
Windows and doors	1.3 W/m^{2}K
Air permeability	3.0 m^3/hr/m^2@50Pa
Thermal bridging	Calculated
Ventilation	Natural & local extract
Lighting	100% low energy
Space Heating	Mains gas boiler
Heating Controls	Time and temperature zone control
DHW	From boiler via cylinder
LZC Generation	None

Passive Design Measures

The proposed dwelling design is traditional in appearance without large expanses of glazing and will be of brick and block construction, providing thermal mass. The property is shaded by large mature trees to each elevation. The combination of these measures reduces the risk of mechanical cooling being required.

Low and zero carbon (LZC) energy

All types of potential LZC energy sources have been considered for this development and the summary of our findings are below:

District Heating

It appears that there are no district heating networks sufficiently close to this site to permit an economic connection.

Communal heating and combined heat & power systems

Neither of these systems are suitable for a single dwelling.

Wind Technology

A wind turbine would not be suitable for this site due to the low average wind speeds and the urban nature of the site.

Hydro technology

Hydroelectric energy relies on a good source of constantly flowing water which is not available for this site.

Biomass

This site is not considered suitable for biomass technology due to the space requirements for the fuel storage and the required lorry deliveries being counter to the local clean air zone requirements.

Heat pumps

Heat pumps are suitable for this site and the current preference is to install a ground source heat pump. This will be sized sufficiently to provide the space heating, domestic hot water and for heating the swimming pool.

Mechanical Heat Recovery Ventilation (MVHR)

A mechanical ventilation heat recovery system or systems will be installed to provide the required ventilation rates for the dwelling. This enables the air quality to remain high when the natural ventilation openings are closed due to security, noise and outdoor air quality issues. The warm moist air from the pool enclosure and other wet rooms that would normally cause condensation issues will be passed through a heat exchanger to pre warm the incoming filtered supply air. Although in itself it is not a renewable technology, the MVHR system is an efficient solution to providing a high quality indoor environment and can contribute to reducing the risk of solar overheating by including a summer bypass, thereby reducing the need for any cooling systems

Photovoltaic (PV) Panels

PV panels are considered to be an appropriate technology for this site as electricity will be the primary fuel for the space heating and domestic hot water. In addition to this, there will be a minimum of two rapid electric vehicle charging points. All electricity generated on site by the PV system will displace power that would have been supplied from the national grid, with the associated carbon emissions from its generation and distribution losses. The PV system can be connected to battery storage and / or connected to the hot water cylinder via a diverter to contribute to hot water heating to make full use of the generated power at times of the day when the energy demand is lower.

Solar thermal

Solar thermal energy could be a consideration for this dwelling as it would reduce the carbon emissions associated with the domestic hot water. There is an unshaded flat roof area available to site solar panels, however it is considered that the available space would be more beneficial for siting photovoltaic panels.

Therefore, on this site, it is proposed to provide a ground source heat pump, photovoltaic panels and an efficient heat recovery ventilation to reduce the CO2 emissions.

SAP 2012 results – Carbon Reduction

Calculation	CO2 (t/yr)	CO2 $kgCo_2/yr/m^2$
Baseline	13.20	13.36
'Be Lean & Be Clean'	12.35	12.55
Reduction over baseline	6.44 %	6.06 %
Be Green	7.63	7.82
Reduction over baseline	42.20 %	41.47 %

Water Efficiency

The dwelling is designed to achieve mains water consumption of no more than 105 litres per person per day plus 5 l/p/d for external use (see appended calculation) based on the following specification:

Fitting	**Maximum Consumption**
WC flush	4/2.6 litres dual flush
Basin taps (in WCs and bathrooms)	5 l/min
Sink taps (kitchen and utility)	5 l/min
Showers	8 l/min
Baths	160 litres to overflow
Dishwasher	1.25l/place setting
Washing machine	8.17 l/kilogram
Waste disposal unit	None fitted
Water softener	None fitted
Total consumption:	**110 litres/person/day (105 internal)**

Flood Risk

Refer to the report produced by GeoSmart Information Ltd.

Sustainable Drainage

Refer to the report produced by GeoSmart Information Ltd.

Summary

The proposed dwelling will have a high specification with low U values, low air permeability and good passive design.

A photovoltaic system, ground source heat pump and mechanical ventilation heat recovery system, combined with low energy lighting and high quality heating and ventilation control systems will reduce carbon emissions to more than 40% below the baseline CO2 emissions.

Metering and sub metering of the building services will provide the occupants with full information on energy use and energy generation.

Water efficiency will be no more than 105 l/p/d for internal use and no more than 110 l/p/d including external use.