SAPS4u
Energy ratings, calculations and advice
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Energy Assessment

The building of a block of 3 new build flats behind the Western Public House on the High Street in Rickmansworth.

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Introduction

The applicant proposes to build a block of 3 new build flats behind the Western Public House on Rickmansworth High Street.

The design is intended to comply with the SPD Climate Change Mitigation and Adaptation Policy of the London Plan. These requirements are to minimise energy use by increasing fabric energy efficiency as much as is practically possible and to increase the affordability of fuel for occupants of the building. The building has been heated with a small air source heat pump in each flat and as many solar PV panels as possible have been accommodated on the flat roof of the building. As the flats are heated electrically and electricity is more expensive than gas, the solar PV panels are connected so that the electricity can be used inside the flats and solar storage batteries have been provided.

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Approach to Sustainability for the Project

Energy and CO_2 Emissions

1. Be Lean – Fabric Efficiency

The thermal fabric of the building conforms to the Londont Energy Transformation Initiative (LETI) typologies. A design air permeability of Q = 1 has been used, using the blown door method of air pressure testing. Triple glazing will be used with a U value of 1.0. 75mm of Celotex CW insulation will be used in the cavity walls with 77.5mm of Celotex thermal plasterboard on the inside leaf of the wall, to give a U value of 0.13 (see U Value Calculations for full details of insulation.) The Aircrete Constructive Details Thermal Bridging Scheme will be used, as this is intended for Aircrete blocks or identical blocks of conductivity between 0.15 and 0.19. The ground floor will be insulated with 200mm of Celotex, giving a U value of 0.10, and the flat roof will be insulated with 200mm of Celotex, giving a U value of 0.12.

2. Be Clean – Heating Infrastructure

This is a comparatively small project and there is no heat network available in this part of Rickmansworth at the present time. It was decided to use a small Mitsubishi air source heat pump or equivalent in each flat. This is an effective way of producing a heating system of similar efficiency to gas without using fossil fuel. A low temperature 35C version of the heat pump will be used with underfloor heating, for increased efficiency. The exact power of the heat pump needs to be discussed with the manufacturer and the installer. The common stairwells and corridors will be heated to reduce heat loss from the flats.

3.1 Be Green – Renewable Energy

The most effective method of providing renewable energy in small apartment blocks is to use solar PV panels. There is sufficient room on the roof for 15 standard 600W solar PV panels of dimensions 2.3M X 1.1M and a total of 9KW of solar PV panels will be installed. Because electricity is a more expensive fuel than gas, these solar PV panels will be connected to the flats' own electricity supply and a 5KW solar storage battery will be installed in each flat. This will lower the occupant's fuel bills considerably and gives a band A on the EPC, which is an indication of fuel affordability.

As part of the SAP calculation, it is necessary to divide the amount of solar PV by the floor area of the whole building, including the industrial ground floor, and then apportion the solar PV to each flat. This is shown in the table below.

Total Building Including Stairwell		Area	Flats	Area		Total KW to Flats	
14	4.45	62.3	1	49.84	0.048	2.40	
		62.3	2	49.84	0.048	2.40	
		62.3	3	49.84	0.048	2.40	
						Solar KW	0.6
						Number	15
						Total KW	9
		186.90	Total Area	149.52		Total Kw/M2	0.048

3.2 Ventilation Strategy

An MVHR system will be installed as the building is expected to have a very low air permeability. Windows will be fitted to the apartments on both sides to allow cross ventilation. The G value of the triple glazed windows is 0.57 in the SAP calculation, which is a typical value for triple glazed windows, although many have a G value less than this. A combination of low U value and low G value prevents heat loss in the winter and overheating in the summer.

3.3 Carbon Offsetting

The amount of space available for solar PV panels is not sufficient to generate the full amount of energy consumed. The following calculation shows the total amount of carbon dioxide emitted by the 3 apartments in tons of CO2 per year and the contribution for the purposes of Carbon Offsetting.

Flat 1	0.05
Flat 2	0.05
Flat 3	0.06
Total CO2/Tons/Year	0.16
Carbon Offset Contribution	
30 X 0.16 X £95	£456.00