

Energy Statement for No.28 Shepherds Close London N6 5AG

Undercurrent Architects

The proposal is a highly sustainable, energy efficient family home, designed with passive design principles, and compliant with Local Plan Policy SP4.

Land Use:

The proposal site is a centrally located, well connected, infill site, providing much needed family accommodation. In land use terms is a highly sustainable brownfield development.

Passive Design Principles:

i) Solar:

The building maximises solar heat gain in the winter months, with a large south facing courtyard, bringing natural warmth and daylight deep into the floor plan.

ii) Air flow:

The design is multi aspect and cross ventilated, with a layout and configuration designed to provide natural air flow and stack ventilation.

iii) Thermal mass:

The thermally massive brick envelope maintains comfort efficiently and remains relatively cool in summer. The use of stone surfaces and slab floors absorb heat and re radiate to reduce the diurnal temperature range.

Bio sustainability:

The proposal includes a bio sustainable landscape, with biodiverse green roofs to all flat roof areas, integrated swift bricks, and a range of green spaces offering both groundcover and tree canopies.

Materials:

The proposed materials are highly sustainable and reusable, and consist of 2nd hand and reclaimed bricks and wood cladding.

Space Heating:

The proposal includes provision for an air source heat pump.

This system has been sized according to the following assumptions, full details on page 3 of the Ecodan document

- Outside design temperature of – 1.8 °C
- Total floor area of 159m².
- U values were assumed to meet Building Regulations

- Air change rate of 1 per hour.
- Flow temperature 45°C.
- Average ceiling height 2.7m

This calculates as a peak heat loss of 6.39 kW. It works out at 43W/m². Therefore, the 8.5kW Ecodan has been selected, paired with 210L Pre-plumbed Cylinder to adequately serve the heating and hot water demand.

For the hot water daily demand, we base our calculation on the number of bedrooms assuming there is one person living in each bedroom. We calculate 45L per person plus an additional 45L for safety, unless otherwise stated. Therefore, we specify a 180 L hot water demand for this property.

P3 Has some estimates on emissions

3185 kWhr per annum for energy consumption in space heating mode

1647 Kg Co2 per annum emitted for space heating – however this is outdated, at the current value of 0.225kg Co2/annum for electricity, this gives $3185 \times 0.225 = 716\text{Kg}$.

This is using the latest data from energysavingtrust.org.uk

As an estimate on carbon saving against a gas boiler that is 90% efficient, we get 14650kWhr/annum used, at 0.213Kg Co2/annum so 3120Kg.

So a saving of $3120 - 716 = 2404\text{Kg Co2}$.

On Site Carbon emissions:

The proposal for a well insulated, draft proof home with a new heat pump significantly reduces on-site carbon dioxide emissions through renewable technologies. In line with Local Plan Policy SP4, it achieves a reduction in predicted carbon dioxide emissions of 20% from on site renewable energy regeneration, and an estimated saving of $3120 - 716 = 2404\text{Kg Co2}$.

Overheating:

Proposed green roofs provide significant insulative effects, reducing unwanted heat, combined with a cross ventilated plan to purge any heat build up.

The stack effect design of the house will allow unwanted heat to be gathered in the double height stair void, and purged from the cross ventilated top floor.

The lower part of the building is sunk into the hill and connected to the earth. This thermally massive design helps to maintain comfort efficiently and remain relatively cool in Summer.

The internal use of stone surfaces & slab floors also absorbs heat and re radiates it to reduce the diurnal temperature range.

Transport:

The proposal is car free and includes provision for secure bike storage.

Rubbish and recycling:

The proposal includes separate provision for rubbish and recycling in line with Haringey Standards.

Water use:

The proposal complies with Haringey's requirements for internal water use of 105 litres per person/day and an additional 5 litres person/day for external water use.

Solar PV Panels:

There is no provision of solar panels.

The environmental benefits of living, green roofs are preferred in terms of their biodiversity, thermal mass insulation and green outlook from the surrounding area.

Flooding and Water retention:

There is no history of localised or general flooding of this location, however the proposed green roofs and landscaped areas act to slow the flow of water after heavy rain events.

The green roof areas will retain water in the substrate, drainage /reservoir board and plants. This water is then used by the vegetation or evaporates back into the atmosphere. The FLL (Landscape Research, Development and Construction Society) reports that, over the course of a calendar year, a green roof can frequently retain 40% of the average rainfall on an extensive green roof with 20-40mm substrate and sedum vegetation, and 90% of average rainfall on an intensive green roof with over 500mm of substrate.

The Energy Hierarchy:

i) Reducing energy demand (be lean):

The house is set out in an east to west alignment and maximises solar orientation centred around a south facing courtyard.

The house has an outlook to the east, south and west, providing multi aspect for natural ventilation and cooling, removing any requirement for air conditioning.

ii) Supplying energy efficiently and cleanly (be clean):

The proposal includes provision for an air source heat pump.

As an estimate on carbon saving against a gas boiler that is 90% efficient, 14650kWhr/annum is used, at 0.213Kg Co2/annum so 3120Kg.

This is a saving of $3120 - 716 = 2404\text{Kg Co}_2$.

iii) Using renewable energy sources (be green):

The proposal includes provision for an air source heat pump, saving an estimate of $3120 - 716 = 2404\text{Kg Co}_2$.