# SUSTAINABILITY STATEMENT

PROJECT KM 2017: SUSTAINABILITY STATEMENT - REV 01

DESIGN PROPOSAL :1 DUNOLLIE ROAD LONDON NW5 2XN
GARAGE SITE RE-DEVELOPMENT

Architect – Francis Birch Architect DiplArch RIBA

## 1.0 Introduction

The new building is to be designed to comply with Camden Council's Planning Guidance sustainability document **CPG3** updated March 2018 for all developments & implement the sustainability design principles as policy **CC1**.

*'…..All new developments are to be designed to minimise carbon dioxide emissions by being as energy efficient as feasible & viable….*'

The Planning Guidance Energy hierarchy are;

- **Be Lean** – Use less energy.
- **Be clean** – Supply energy effectively.
- **Be Green** – Use renewable energy

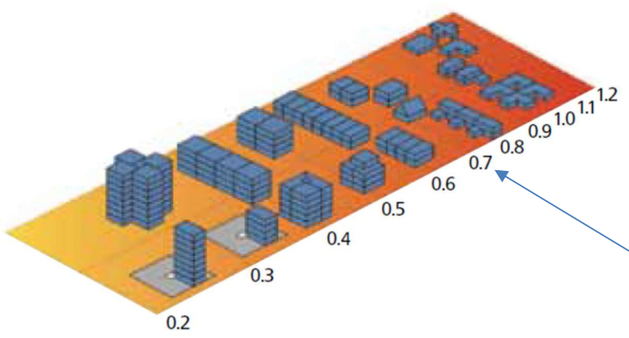
To meet the above criteria, the approach proposed for the design of the new building is to follow where practically possible 'Passivhaus' principles as outlined in the BRE 'Passivhaus' Primer - Designers Guide.

## 2.0 Passivhaus Standards

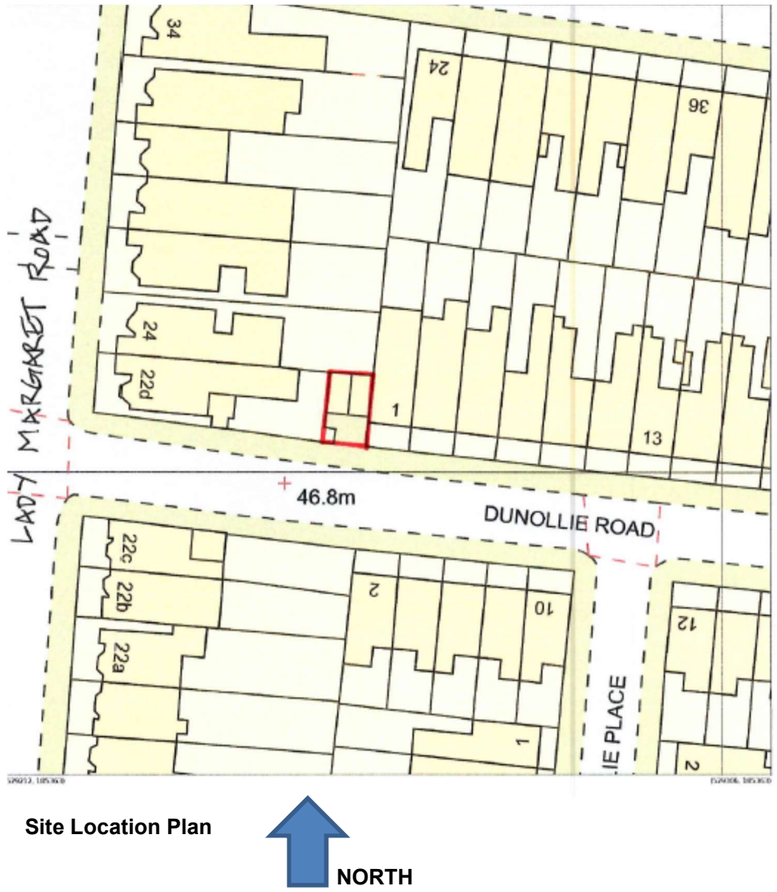
### 1. Orientation.

Ideally a Passivhaus building should be orientated along an East/west axis so that the building faces within 30 degrees of due south to allow the building to derive maximum benefit from useful solar gains. This is predominately available to the south facing façade to the street during the winter months. This greatly reduces annual heating demand by 30-40% as a result.

This is possible with the orientation of the proposed building which has the principle windows to the south façade being 15 degrees from due south.




igure 1 Surface area to volume ratio (A/V)


Site Location Plan

### 2. Building Form.

It is important to achieve a compact surface area/volume ratio particularly with small buildings of 2 storeys or less which have a higher A/V ratio than larger & taller buildings. This ratio will affect the insulation thicknesses, glazing & rooflight U values required to achieve Passivhaus standards. A favourable A/V ratio for a small building would be < 0.7 ratio.

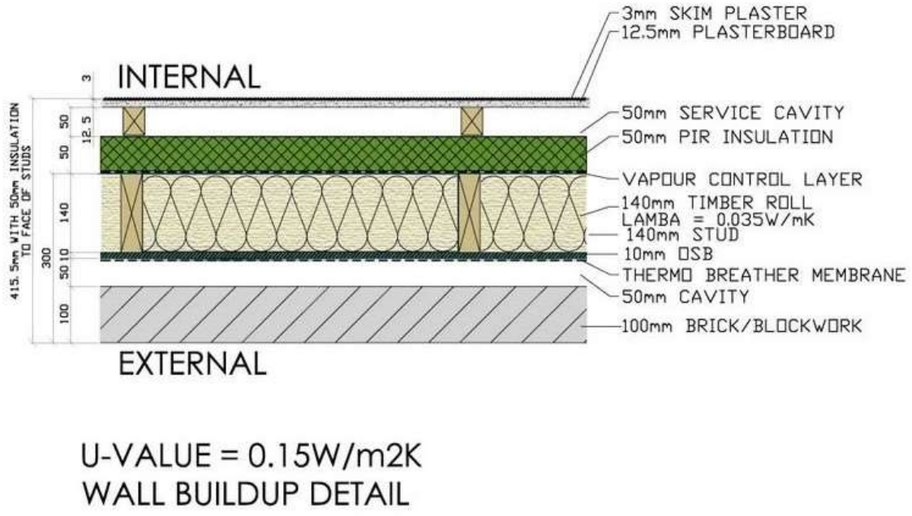
The proposed building is very compact & its target A/V ratio is aided by the basement & the adjoining end of terrace house conditions.

### 3. U values of fabric & opaque elements.

The Passivhaus standard requires that all thermal elements have very good U values.

- Walls, floors& roofs < 0.15W/m2K
- Complete window installation < 0.85W/m2K

The principle external walls are generally 400mm thick & could utilise a range of wall builld-up systems including highly insulated timber stud framed superstructure with an external brick skin cladding. High performance triple glazing will be used for all windows & rooflights, The main roof U value will also be supplemented by the inclusion of an extensive green sedum roof finish which will aid surface water run-off.




U-VALUE = 0.15W/m2K
WALL BUILDUP DETAIL

### 4. Thermal Bridges & Airtightness.

In Passivhaus detail design care is need to avoid cold bridging both in the detailing & workmanship. In order to reduce the heating demand a high level of airtightnes to the exterior fabric is required using air tight membranes within each of the building elements, which at 0.6 air changes per hour @ 50pascals is well in excess of the current Part L of Building regulations.

### 5. Glazing & Solar Gains.

In order to benefit from useful solar gains a Passivhaus requires glazing to be optimised on the south which the proposed building has as it is predominately single aspect to the south. The internal layout is arranged with the bathrooms & non-habitable rooms placed to the north facade. All windows are triple glazed high-performance type. Natural shading to the windows is provided by the 1.8m high screen wall on the street to the ground floor kitchen dining area & to the front lightwell serving the basement bedrooms. External shading blinds can be incorporated to the 1st floor windows to avoid summer over heating depending on later stage calculation.

### 6. Mechanical ventilation with heat recovery (MVHR).

Currently the only way to avoid ventilation heat losses & provide consistently good air quality in an energy efficient manner is by using a Mechanical Ventilation with Heat Recovery Unit (MVHR). This works by extracting warm air from bathrooms & other rooms & supplying fresh air to living room & other habitable rooms. The extracted warm air passes through a heat exchanger in the unit which warms the incoming fresh air. The incoming & extract air is kept separate & the unit has a small in built electric heater for frost protection in winter.

As the heating demand is low, a conventional central heating boiler feeding radiators or under-floor hating is not required as the heat given off by appliances will be sufficient to maintain an internal temperature of 20 degC. However a small additional electric heater battery in the MVHR unit can be included should this be required for the coldest days in winter.

### 7. Primary energy appliances

In order to achieve the overall Passivhaus Primary Energy Target, high energy efficient appliances (A++rated washing machines, dishwashers etc) & equipment (fans, pumps & lighting) are to be specified for the new building.

| Building energy performance | |
|---|---|
| Specific heating demand | ≤ 15kWh/m².yr |
| or Specific Peak load | ≤ 10 W/m² |
| Specific cooling demand | ≤ 15kWh/m².yr |
| Primary energy demand | ≤ 120kWh/m².yr |
| **Elemental performance requirements** | |
| Airtightness | ≤0.6 ac/h (n50) |
| Window U value | ≤ 0.80 W/m²K |
| Window installed U value | ≤ 0.85 W/m²K |
| **Services performance** | |
| MVHR heat recovery efficiency | ≥ 75%* |
| MVHR electrical efficiency | ≤ 0.45 Wh/m³ |
| **Thermal and acoustic comfort criteria** | |
| Overheating frequency | > 25°C ≤ 10% of year |
| Maximum sound from MVHR unit | 35 dB(A) |
| Maximum transfer sound in occupied rooms | 25 dB(A) |
| * Note MVHR efficiency must be calculated according to Passivhaus standards not manufacturer's rating | |

**Passivhaus Certification Requirements**

**3.0 Renewable Energy.**

Solar Panels either for hot water or to generate electricity have not been included in the proposals as it is not possible to satisfactorily integrate them into the design. The need for such devices is not recommended in the Passivhaus guidance which stresses the need to achieve efficient energy use through high fabric U values & airtightness.

**4.0 Water Efficiency.**

Minimisation of water use through choice of sanitary fittings & taps including dual flush WC & limits on bath capacity. This is to comply with water use limit internally of 105 litres/person/day & externally of 5 litres/person/day.

**5.0 Sustainable materials.**

10% value of all materials will be sourced from re-cycled materials. The new building will use recycled 2nd hand London stock bricks in the external facades to match the texture & finish of the existing brickwork facades of the adjoining 19th century terrace houses.

Site waste management during construction will be as outlined in the Construction Management Plan for the project when on site, to be secured by S106 as a condition of any planning consent.

**6.0 Surface Water.**

Permeable paving will be used where possible to the external entrance path & basement lightwell patio area to reduce water flow into the main sewer. The roof drainage will however be connecet to the main sewer however this roof will have an extensive Green sedum roof which will reduce the surface water flow rate.

**Francis Birch** Dipl.Arch RIBA
**Architect**