22 February 2022

DP9 Ltd
100 Pall Mall
London
SW1Y 5NQ

Dear Archie Halls,

21 Belsize Park, London, NW3 4DU – Energy & Sustainability Option

Further to the recent feedback from the Local Authority regarding Policy CC1 of the Camden Local Plan on the above residential development, please find below our summary technical response and supporting calculations clarifying the proposed energy solution on behalf of the end client.

The Proposed Development consists of a conversion of a Victorian property - developed in the mid 1850's – from a small hotel and garden flat, into a 6-bed residential home situated over five floors. The predicted actual building energy requirement is compared against a Building Regulations Part L1B compliant design, to meet the following planning policy requirements outlined in the Camden Local Plan:

- Min 19% improvement through energy efficiency measures over Building Regulations 2013 Standards
- Additional 20% reduction in CO_2 emission from on-site renewable energy generation

The Camden Local Plan also encourages an 'Excellent' BREEAM for a conversion or extension which has a residential floor space of 500 sqm or more. Since the floor area of the conversion element is <500 sqm and due to the prohibitive costs associated with BREEAM 'Excellent' certification, a pre-assessment will not be undertaken. Instead, the focus and investment will be on resource use and prioritising the energy strategy to achieve the targets set by the Local Planning Policy.

The adopted approach for the site is to deliver an energy efficient performing building envelope and supplement this with on-site renewable energy (RE)/ low zero carbon (LZC) technologies. The following specification has been designed for the Proposed Development:

Passive Design Measures

- Elements of shading provided to glazed areas through internal curtains & blinds
- The positioning of habitable rooms within the building will be designed to maximise natural light and positive solar gains
- The majority of glazing on the North elevation will be upgraded to Low E double glazing which will minimise overall heat loss.
- In line with conservation requirements, the property will have no noticeable visual changes to the external envelope, with the main solid brick and render structure being retained, which means the embodied carbon on site will be low
- Well insulated through all external elements with a low air infiltration rate
- Medium thermal mass construction will balance high energy efficiency and help limit overheating during summer months

Element	Notional Compliance (U-value)	Proposed (U-value)
External Brick & Rendered Walls	0.30 - 1.70	0.26 - 1.70
Boiler/Guest Room Wall Upgrade	0.30	0.28
Loft Dwarf Walls	0.30	0.28
Retained Roofs	0.68	0.68
Upgraded Roofs	0.16 - 0.18	0.16 - 0.18
Ground Floor	0.41	0.41
Exposed Floor	0.34	0.34
Windows and Rooflights New	1.60	1.20
Windows Retained	4.80	4.80
Solid Door New	1.8	1.4
Solid Door Retained	3.00	3.00
Air Tightness @ 50 N/m^2	15 ($m^3/hr/m^2$)	15 ($m^3/hr/m^2$)
Thermal Bridge	Not Applicable	Not Applicable

Table 1 – Fabric Energy Efficiencies

Active Design Measures

- 100% low energy/LED lighting
- Time, temperature zone controls
- Highly efficient Air Source Heat Pump (ASHP) which will be appropriately sized and specified to provide adequate heating and hot water whilst having low ambient noise levels

Cooling Hierarchy

Cooling Hierarchy	Potential Design Measures
Minimising internal heat generation through energy efficient design	All primary pipework to be insulated, therefore low system losses. Low energy lighting throughout with minimal heat output. High specification hot water cylinder installed with low heat loss.

Reducing the amount of heat entering the building in summer	All windows on the side and rear elevations (excluding bay windows and dormer windows) will be upgraded to Low E glass windows which will minimise solar gain in addition to internal blinds. All upgraded walls are to be well insulated.
Use of thermal mass and high ceilings to manage the heat within the building	Thermal mass is anticipated to be medium with some element of exposed mass (party wall).
Passive Ventilation	Openable windows will be provided to all habitable rooms and cross ventilation is possible.
Mechanical Ventilation	Standard extract.

Table 2 – Design measures following the cooling hierarchy

Air Source Heat Pump

Heat pumps are a renewable source of energy and has the potential to provide significant offset in CO_2 emissions for this development.

The ASHP will be appropriately positioned behind the existing garden wall and adjacent to the boundary wall to avoid any visual impacts within the conservation area or compromise to system performance. Additionally, it will be within an acoustic enclosure to prevent any potential noise disturbance to the building occupants and neighbours, and this will be supported by a site-specific acoustic assessment.

Photovoltaics

The installation of PV will be used to offset electrical demand within the Proposed Development. Aesthetically, the implementation of PV slates would be ideal within the Belsize Conservation Area, since compared to standard PV arrays, these slates will blend more effectively into the surrounding roof scape.

Based on a 25W PV slate (~0.18m^2 in area), an indicative proposed 6.1kWp PV system is to be installed - equivalent to 244 no. PV slates.

Local Policy Energy Requirements

Based on SAP 2012 calculations, the Proposed Development is able to achieve a total 20.83% offset in CO_2 emissions compared to a Building Regulations Part L1B compliant design using passive and active design measures. This exceeds the Local Planning Policy requiring a minimum 19% improvement through energy efficiency measures.

Energy Hierarchy	CO_2 emissions (t/yr)
Baseline	21.56
Lean	17.07
% Offset	20.83

Table 3 – Energy Efficiency Measures Offset in CO_2 emissions

The Camden Local Plan also states a 20% reduction in CO_2 emission is required using Green LZC technologies alone. With the proposed ASHP and PV slates, this will provide 20.09% reduction, thus delivering the Local Planning Policy requirement. The energy figures are summarised below:

Energy Hierarchy	CO_2 emissions (t/yr)
Clean	17.07
Green	13.64
% Offset	20.09

Table 4 – LZC Offset in CO_2 emissions

Please find attached the DER worksheets produced by the SAP 2012 software in support of the above energy requirement figures.

If you have any questions, please contact me.

Yours Sincerely,

Malcolm Maclean
Director

Elmhurst OCDEA
BREEAM AP & Assessor

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