

Re: **ENERGY STATEMENT**, 25 Ham Farm Road, London TW 10 5NA

Dear Sir/Madam

This report assesses the predicted energy performance and carbon dioxide emissions of the proposed development of the site located at 25 Ham Farm Road, London TW 10 5NA

Re-use vs Re-Develop

The development will replace an existing single-storey bungalow. In assessing appropriate strategies for the site, a serious embrace of environmental ambitions is essential. For this reason, the initial aim was to retain the existing dwelling and to substantially redevelop it.

The EPC for the existing property is extremely poor, rating a 32 F SAP rating. The property is modelled as producing 12 tonnes of CO₂, double the national household average. The EPC notes that by making recommended changes the carbon footprint could be reduced by 6.9 tonnes/year or about 42%. The sap rating could rise at most to the lowest C rating (69), with the environmental rating potentially only reaching a D. This does not align the property with the Future Homes Standard, and if the improvements failed to reach 69 in a revised EPC it would fail to comply with upcoming legislation requiring an EPC of C for rental purposes. Potential damp and mould issues must be eliminated to improve air quality and performance standards. All these would be required to be addressed and add to the complexity of the extensive renovations required. The final performance after these extensive renovations is only mediocre.

After consideration, replacing the existing property with a highly-efficient building meeting and far exceeding the New London Plan and local authority targets brings strong benefits and is the preferred option.

A SAP rating has been carried out confirming that the proposed building far exceeds current requirements and could meet the Net Zero Carbon ambitions for UK property in future.

Based on the London Plan, there are 3 steps in reducing energy use:

BE LEAN - use less energy

This first step requires reduction in energy demand, through the adoption of sustainable design and construction measures.

In accordance with this strategy, this development will incorporate a range of energy efficiency measures:

Enhanced Building Fabric

A building with low U-values provides better levels of insulation and reduced heating demand during the cooler months.

The new build will incorporate high levels of insulation and high- performance glazing to exceed Part L1a 2013 targets and notional building specifications, in order to reduce the demand for space heating. These are detailed below:

Roof walls and floors achieve 0.11 W/m²K (U-value).

Doors will achieve 0.60 W/m²K

Windows including roof windows will achieve 0.8 W/m²K

The improved fabric is modelled with a highly energy efficient heat pump. The heat pump is a drag on the SAP rating as the energy cost to run a heat pump is higher than the energy cost of a traditional boiler. However, the efficient fabric and heat pump reduce the carbon footprint from 9.38 tonnes (baseline of the new-build property to current Building Regs) to 6.44 tonnes, a 31.34 reduction from the baseline, and a 46.33% reduction from the existing building. Thus the fabric improvements alone of the new-build exceed all potential improvements applied to the existing building.

A green roof combined with solar panels deflect heat loading from the roof in summer to reduce potential over overheating. Pergola shading and extensive mixed landscaping including mature trees, a pond, as well as generally increased planted area, will reduce heat island effect on the site and further contribute to a climate-ready approach.

Thermal Bridging

Accredited construction details will be adopted for thermal bridging, ensuring that residual heat does not escape from the various junctions throughout the house.

Natural Ventilation and Cooling

The building achieves 6 Air Changes per hour from extensive sliding doors, openable/purge ventilation and energy efficient mechanical ventilation to wet areas. The dual aspect of the plan is based on a building depth which supports

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passive cross-ventilation. Additional purging is carried out via roof lights over areas which are more likely to need extra ventilation (kitchen, communal areas) so no whole-house mechanical ventilation system is needed.

This approach which will also reduce potential overheating is further supported by the external landscaping approach, which includes additional mature trees, a large planted pergola shading the South-west facade and maximized green landscaping, as well as a green roof.

Be Clean - supply energy efficiently

The second step prioritises decentralised energy generation. This ambition can only be realized if a sufficient network is in place, since single domestic properties on typical plots do not have sufficient scale to act as providers. There are no existing district heating networks within close proximity of the site that are feasible for connection.

The use of a CHP system is discounted due to the small size of the development

The property can be made ready to connect to such a network in the future should this opportunity be made available.

Be Green - use renewable energy

The third strategy covers the use of renewable technologies.

Relevant renewables might include biomass heating, ground source heat pump, air-source heat pump, solar photovoltaics, solar thermal and wind turbines.

An air source heat pump is the most suitable technology for the proposed development compared to a ground source heat pump given the plot size and need to retain as many of the existing trees as possible. A Daikin Altherma ERGA06DAV3A + EHBX08DA6V has been modelled as it is the most efficient system included in the current version of SAP software. A system that is at least as or more efficient as the Daikin Altherma will be selected for final fix.

A 3.6 kW PV array accommodated on a 30% sloping SW-facing roof portion with minimal shading will reduce carbon from 6.44 tonnes to 0.76 tonnes annually. This is a 60.56% reduction from the baseline provided by renewables.

Total reduction in energy use

Between fabric and renewables, the carbon footprint is reduced from the Baseline new build of 91.9%, compared to the target of 35%, and compared to the existing building the reduction is a reduction of 93.7%. Compared to the

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best-case scenario for the existing building it reduces the carbon footprint by a further 4.34 tonnes or by 85%, a significant improvement.

Daylight

Daylight is maximized in all habitable spaces to improve health and wellbeing of occupants. This measure reduces the need for artificial lighting whilst delivering pleasant, healthy spaces for occupants. Daylight factor will be modelled to ensure targets are achieved of between 1.5% and 2%, earning points under the Home Quality Mark scheme.

High Efficacy Lighting

The development will incorporate 100% low energy lighting fittings throughout. All light fittings will be specified as low energy lighting and will accommodate LED luminaries only.

Conclusion

In order to demonstrate that the dwellings have been designed in accordance with the Mayor's energy hierarchy (*be lean; be clean; be green*) outlined in Policy 5.2 of the London Plan:

Regulated CO2 emissions for the dwelling will be reduced by over 91% beyond minimum building regulations standards (2013).

If you require any further information, please don't hesitate to contact me.

Yours Faithfully

Melissa Merryweather
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