21 Chalcot Square

Sustainability Statement

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SPACE A.

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SUSTAINABILITY STATEMENT

a) Introduction

Project Address :

21 Chalcot Square
London
NW1 8YB

This sustainability statement is to be read in conjunction with the Design & Access Statement & Heritage Statement.

Camden Council requires a sustainability statement for

- All new build residential houses and flats
- Multi-occupation residential buildings with 10 or more rooms/units or occupiers
- Residential refurbishments, conversions and change of use for:
- 5 or more dwellings, or
- 500sgm or more of floorspace
- Non-residential development of 500sqm of more of floor spaces (including offices, retail and industrial)

As this application is for a single-family residential property of less than 500sqm of floor space - it is outside of the scope of applications requiring a sustainability statement above. However, in recognition of the listed status this report has been produced to justify the requirement for mechanical cooling and heating in the property.

Conjunction with the following drawings:
1140_PL_B1_001, 1140_PL_00_002, 1140_PL_01_003, 1140_PL_02_004, 1140_PL_03_005, 1140_PL_04_006, 1140_PL_05_007, 1140_PL_SE_008, 1140_PL_SE_009, 1140_PL_SE_010, 1140_PL_05_011, 1140_PL_B1_012, 1140_PL_00_013, 1140_PL_01_014, 1140_PL_02_015, 1140_PL_03_016, 1140_PL_04_017, 1140_PL_05_018, 1140_PL_SE_019, 1140_PL_SE_020, 1140_PL_SE_021, 1140_PL_SE_022

Fig 1: 21 Chalcot is situated in the north east corner of Chalcot square

b) Camden Local Plan

The Camden Local plan policy CC2 states:

Policy CC2 Adapting to climate change
The Council will require development to be resilient to climate change. All development should adopt appropriate climate change adaptation measure such as :
a. The protection of existing green spaces and promoting new appropriate green infrastructure;
b. not increasing, and wherever possible reducing, surface water run off through increasing permeable surfaces and use of Sustainable Drainage Systems;
c. incorporating bio-diverse roofs, combination green and blue roofs and green walls where appropriate; and
d. measures to reduce the impact of urban and dwelling overheating, included application of the cooling hierarchy.
Any development involving 5 or more residential units or 500 sqm or more of any additional floorspace is required to demonstrate the above in a Sustainability Statement.

Sustainable design and construction measures
The Council will promote and measure sustainable design and construction by :
e. ensuring development schemes demonstrate how adaptation measures and sustainable development principles have been incorporated into the design and proposed implementation;
f. encourage new build residential development to use the Home Quality Mark and Passivhaus design standards;
g. encouraging conversions and extensions of 500 sqm of residential floorspace or above or five or more dwellings to achieve “excellent” in BREEAM domestic refurbishment; and
h. expecting non-domestic developments of 500 sqm of floorspace or above to achieve “excellent” in BREEAM assessments and encouraging zero carbon in new development from 2019.

The policy requirements ‘a-c’ and ‘e-h’ are not relevant to this application. We will address requirement ‘d’ within the CC2 policy.

c) Requirement for mechanical cooling

Policy 5.9 Overheating and Cooling of the London Plan states:

5.*47 London will experience higher average temperatures. This is likely to intensify the urban heat island effect – the way higher ambient temperatures are experienced after sunset in urban areas in comparison with rural areas. This is most intense at night and in London is principally experienced within the Central Activities Zone, as buildings and roads absorb more solar radiation than green space and vegetation. Combined with man-made heat emissions, this can make the centre of London up to eight degrees warmer than the Green Belt on hot summer nights.*

21 Chalcot Square borders the Central Activities Zone and suffers the higher than average temperatures referenced above. The introduction of mechanical assisted ventilation is necessary to mitigate the dwelling overheating experienced at the residence.

d) Cooling Hierarchy

The London Plan ‘cooling hierarchy’ (Policy B of 5.9 - ‘Overheating and Cooling’) was applied to this scheme and informed the choice of a reversible air source heat pump as the appropriate solution for cooling and heating.

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1. Minimise internal heat generation through energy efficient design:
- The application is solely for the addition of a mechanical cooling and heating unit and therefore the scheme offers no opportunity to integrate energy efficient design elsewhere.
- All existing halogen light fittings are to be replaced with LED lights to improve the energy efficiency of the house without impacting the grade II listed building fabric.

2. Reduce the amount of heat entering a building in summer through orientation, shading, albedo fenestration insulation and green roofs and walls:
- The property's location in the Primrose Hill Conservation Area, as well as being Grade II listed prevents the introduction of these measures to reduce heat entering the building.

3. Manage the heat within the building through exposed internal thermal mass and high ceilings:
- There are existing high ceilings in the ground, first and third floors, which do no not mitigate the thermal gain. It is not possible to expose internal thermal mass of an existing building without causing significant harm to the property.

4. Passive ventilation:
- Not possible to retrospectively implement within an existing building. Passive ventilation will be used where ever possible through opening windows, but as mentioned below and as supported by the Heat Impact Assessment this is not a suitable permanent solution.

5. Mechanical ventilation:
- The application is solely for the addition of a mechanical cooling and heating unit and therefore the scheme offers no opportunity to integrate mechanical ventilation without causing significant harm to the existing property. The application property's location within the Primrose Hill Conservation Area also inhibits introducing these measures.

6. Active cooling and heating systems (ensuring they are the lowest carbon options)
- This is the only suitable solution for this proposal

e) Natural and Cooling Ventilation

Natural and cross ventilation are the favoured solution to solving the overheating situation in these spaces, but these have been thoroughly tried and tested within the property and found to be insufficient to mitigate the thermal gain the property suffers. This has been proven with the evidence from the Thermal Dynamic Modelling/ Overheating Assessment which is an appendix to this document.
The Thermal Dynamic Modelling/Overheating Assessment concluded "that to mitigate the overheating risk within the habitable spaces mechanical cooling will be required."

The use of natural ventilation is not currently sufficient to reduce heat build-up on the floors in question. The host building is Grade II listed and opportunities to change layouts/orientations/ ceiling heights, or increase thermal masses are highly limited. The scope for passive measures to control excess heat at the property, given its heritage constraints, is therefore limited. Given this context, it is considered that the proposal for the reversible air source heat pump is acceptable in this instance.

As an 1860s era building it was designed with natural ventilation in mind. High ceilings to the ground, first and third floors (the third had alterations added in the 1990's), mitigate thermal gain to an insufficient degree. Moreover due to the change in environment and modes of living - which include use as offices - this feature is inadequate to address the cooling needs of the house, which suffers from overheating.

The house faces south west and is particularly exposed to the heat of summer afternoon sun. In particular this impacts the top three floors of the house - the living space, bedroom & the two home offices on the third floor reach unbearable temperatures in the summer months. Excessive build-up of heat during some days during these months makes the rooms on the relevant floors virtually uninhabitable.
The overheating is exacerbated because the windows cannot be fully opened for a number of reasons: security requirements; health requirements - one of the main residents suffers from severe hay fever and allergies - and the need for sound insulation in the third floor offices.

As referenced in The Camden Local Plan (Adopted 2017), Policy A1: 'The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity. We will .... seek to ensure that the amenity of communities, occupiers and neighbours is protected.'
Ventilation and thermal comfort are evidently a requirement for quality of life, and as sole use of cross ventilation damages the health of the occupant, the installation of the fixed reversible air source heat pump will serve this purpose without damaging amenity.

As the Thermal Dynamic Modelling Study shows even when the windows are 25% open the rooms fail the thermal dynamic modelling test.
The proposal seeks to install mechanical cooling only to the areas worst affected by the dwelling overheating, therefore minimising any perceived negative impact of installing mechanical cooling.

f) Suitability of Active Cooling System

The unit has been chosen due to its ability to heat as well as cool. In winter, the unit will reduce the need for gas heating - therefore increasing the energy efficiency of the property and lessening reliance on gas.
The air-sourced heat pump has been specifically chosen for its energy efficiency. Using Variable Refrigerant Temperature Technology (VRT), the unit increases seasonal efficiency by up to 28% when compared to other solutions.
The units chosen allow rooms requiring cooling to be switched on independently, so as to ensure maximum energy efficiency. The units chosen also have timer settings to ensure they are only used during the hottest hours.

f) Relevant Planning Approval

In preparing this application we have researched similar applications that have gained approval in the Primrose Hill Conservation Area or in neighbouring conservation areas. There are numerous, below are some examples of recent cases which have gained approval :

- 2021/4822/L - 38 Chester Terrace. (Grade I Listed)
  Installation of two external air conditioning units and associated acoustic enclosure in the rear lower ground floor courtyard and associated internal works including the relocation of the fan coil unit (FCU) on the first floor.
  *Objection from PHCAAC

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- 2019/0556/P - 18 Regent's Park Road (Primrose Hill Conservation Area)
  Installation of two external air conditioning units and associated acoustic enclosure in the rear lower ground floor courtyard and associated internal works including the relocation of the fan coil unit (FCU) on the first floor.
  *Objection from PHCAAC

- 2019/5443 - 12 Keats Grove (Grade II Listed)
  Installation of 3 air conditioning units to rear garden.

- 2019/2550/L - 10 St George's Terrace (Grade II Listed)
  Installation of an external free-standing air condenser unit on the roof terrace at front elevation.
  *Objection from PHCAAC

- 2018/4209/L - Flat 2-3, 10 Cambridge Gate (Grade II Listed)
  Alterations to internal layout involving works to staircase, doors, decorative features and installation of under floor heating and air conditioning; installation of 2 condenser units to the rear roof with associated acoustic enclosure.
  *Objection from PHCAAC

- 2018/3245/P - Paxton House 15 St George's Mews (Primrose Hill Conservation Area)
  Installation of 3x air conditioning units (1x retrospective) to first floor roof level behind front parapet

g) Conclusion

This statement and the accompanying Thermal Dynamic Modelling has demonstrated that the property in this application requires mechanical cooling to control the internal environment temperature. The Thermal Dynamic Modelling shows that all five floors in the property require mechanical cooling. However, the proposal is only for mechanical cooling on the three upper floors (offices, bedroom and living room) in order to balance the requirements of the residents with the most efficient environmental solution. It should also be noted that the air-source heat pump will be used for heating the top three floors of the property in the winter, thereby reducing overall gas usage.
Every effort has been made to ensure that this is the most suitable system - a fixed reversible air source heat pump to provide year-round sustainable and energy-efficient temperature control.