WEBB YATES ENGINEERS

Proposed Overheating and Cooling Statement

J3988 Shelton Street

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Webb Yates Engineers Ltd
48-50 Scrutton Street
London. EC2A 4HH
020 3696 1550
london@webbyates.com
www.webbyates.com

Registered in England & Wales No.: 5393930

REVISION HISTORY

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1. COOLING AND OVERHEATING

Camden Planning have requested that a refurbishment of a 5 bedroomed flat a Shelton Street, WC2H9HW complies with the following Excerpt from the London Plan.

We would note that that Policy SI 4 is usually associated with larger scale developments, however we understand the principle being adopted in this case.
The following explains the process involved to mitigate the requirement for cooling within a large scale development. Within existing constructions the process will be limited by nature of existing fabric, orientation building form and whether any overshadowing exists.

Explanation of Policy S1.4

'The Mayor of London seeks to reduce the impact of urban heat island effect in London and encourages the design of places and spaces to avoid overheating and excessive heat generation, and to reduce overheating due to the impacts of climate change and the urban heat island effect. Policy SI 4 asks all development proposals to minimise adverse impacts on the urban heat island through design, layout, orientation materials and incorporation of green infrastructure.

Policy SI 4 of the London Plan has set out the Cooling Hierarchy to be followed for major development to ensure that suitable passive design measures have been incorporated into the design prior to the inclusion of any active cooling:

1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
2) minimise internal heat generation through energy efficient design
3) manage the heat within the building through exposed internal thermal mass and high ceilings
4) provide passive ventilation
5) provide mechanical ventilation
6) provide active cooling systems'

Camden council is seeking all development to adapt to climate change by regulating all development to reduce the impact of urban and dwelling overheating, including application of the cooling hierarchy. All new developments are expected to submit a statement demonstrating how the London Plan's 'cooling hierarchy' has informed the building design.

Proposed Response

Although the proposed retrofit of the existing property does not fall under the category of major development nor is a new development, we would propose it is still proposed that the refurbishment works have been designed with the inclusion of first stages of the cooling hierarchy.

Stage one of the Cooling Hierarchy is to minimise the amount of heat entering the building through energy efficient design, this has been achieved through replacing all existing windows with double glazed windows with a low g-value of 0.4938. In addition, high performance double glazed rooflights with low g-values will be installed to replace the existing rooflights in 6th floor living areas. All southerly oriented glazing will be provided with internal shades.

The orientation and the location of the existing glazing constrains the capability of reducing the heat gains through the high performance glazing. The existing property height (6th Floor), results in no immediate overshadowing is provided by surrounding buildings.

The existing building thermal envelope has been upgraded with insulation attached to all external walls and roofs. Both flat roof under the terraces and pitched roof have been designed to be lined up with more than 100mm insulation to reduce the energy consumption for conditioning the internal space. All new installed double glazed windows have been specified with a high energy efficient U value of 1.086 W/m2.K. Whilst the application of insulation reduces heating related carbon emissions, unfortunately it does impact negatively on internal temperatures during the summer period.

Stage two of the Cooling Hierarchy is to minimise internal heat generation through energy efficient design. Low energy lighting has been specified with occupancy controls to be provided for the luminaire.

Medium thermal mass is expected in the dwelling. The double height space between the 6th level pitched roof is existing and is inherently thermally light weight and creates high gains into the living space.

The next stage of the cooling hierarchy is to consider passive and active ventilation methods. Passive ventilation through openable windows and rooflights has been proposed. The required air changes to mitigate the overheating risk will be achieved via the openable windows/rooflights stack effect and cross ventilation. Energy efficient equipment such as mechanical ventilation supply and extract fans with highly efficient heat recovery system has been specified to create robust air circulation within the dwelling.

It is proposed to complete a dynamic thermal simulation using TAS software from EDSL. CIBSE guide TM59, entitled 'Design methodology for the assessment of overheating risk in homes. The dynamic thermal model will be established following the passive measures discussed above in order to maximise the thermal comfort and minimise overheating risks for the proposed dwelling. The proposed modelling process will fully comply with Policy PI 4.