6.3
Cooling Heirarchy Compliance

Cooling Hierarchy

London Plan

Greater London Authority Policy 5.9 of the London Plan states that major development proposals should reduce potential oveheating and reliance on air-conditioning systems and demonstrate this in accordance with the following cooling hierarchy:

- Minimise internal heat generation through energy efficient design.

- Reduce the amount of heat entering a building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls

- Passive or mechanical ventilation within less frequent use transient spaces example stair well

- Active cooling systems (ensuring they are the lowest carbon options)

Camden Council

In addition to GLA's policy, Camden Council's Sustainabilty Plan 'Green Action for Change' expects that all new developments are designed to minimise energy use and CO2 emissions in operation through the application of the energy hierarchy. The design reviews Camden Planning Guidance Energy efficiency and adaptaion, January 2021, which supports its Local Plan 2017. The Camden Local Plan ***Section 8 Sustainability and Climate Change*** describes the energy heirarchy as a series of steps to minimise energy consumption of a building. It prioritises lower cost passive design measures such as improved fabric performance over higher cost active systems such as renewable energy technologies. These steps are to ***Be Lean*** (use less energy), ***Be Clean*** (supply energy efficiently), and ***Be Green*** (use renewable energy).

40-42 Hatton Garden Design Compliance

The objective of this cooling heirarchy statement is to demonstrate compliance of 40-42 Hatton Garden development with the policies noted above.

Cooling Hierarchy – Design Principles

The below is a summary of the passive design features applied to the proposed development with the aim to minimise the need for cooling in this existing building in a Conservation Area. It should be noted that this planning application is limited to window replacement, and no other works to the building fabric are proposed.

1. All existing operable windows will be replaced with new thermally improved models with a Uw Value of 1.6 W/m^{2}K (except those which have already been boarded over internally and which therefore do not contribute to solar gain or overheating). These new windows are is an improvement of 11% over the Approved Document L2B Conservation of fuel and power in existing buildings other than dwellings requirements which states a Uw Value of 1.8 W/m^{2}K for the whole unit is required.

2. The single corner glazed unit on each floor will be repaced with a new thermally improved fixed glazed unit with a Uw of 1.1 W/m^{2}K. This represents a 38% improvement over the building regulations U Value requirement.

3. All new windows except the corner glazed units are operable. This allows for natural cross ventilation and cooling of the office space on floors.

3. The streetfront elevation faces west and as such existing office windows are affected by solar gain. It is therefore proposed that the new replacement windows have solar control glazing with an improved g-value of 0.45 (see attached technical sheet for glass). Other passive measures to reduce solar gain on this elevation such as reducing the amount of glazing or adding shading panels were not deemed appropriate given the sensitive Conservation Area setting and the reduction of natural daylighting that would entail. This facade is not over-glazed and has a mixture of solid and glass.

4. The new ground floor level windows will have clear glazing without any solar control treatment due to the nature of activity that demands transparency to create a more active frontage. These low level windows do not experience extended periods of direct sunlight like the upper office floors as a result of the overshadowing from the buildings on the street opposite, and as such solar control treatment is not critical.

5. The rear courtyard elevation faces east so does not suffer from hot afternoon solar gain, and additionally it is largely over shadowed by the close proximity of neighbouring buildings. As with the streetfront facade, the rear elevation is not over glazed, and contains a large proportion of solid wall. As such, there is no reduction in glazing proposed on this elevation. For visual internal consistency, new replacement windows will have the same 0.45 g-value so any possible thermal gain when the sun is highest will also be reduced.

6. The north and south elevations only have very small windows, their elevation being comprised largely of masonry and that, combined with the orientation and overshadowing caused by the close proximity of neighbouring buildings means these windows do not have a significant impact on any overheating.

Cooling Hierarchy Compliance

1. All new windows have excellent thermal performance to reduce the energy needed for heating.

2. Solar control glazing has been specified on all windows to minimise overheating.

3. Openable windows have been provided for natural ventilation.

4. Due to the proximity next to a busy road there is the potential for poorer indoor air quality and acoustic issues associated with relying solely on natural ventilation to provide thermal comfort. Therefore, energy efficient comfort cooling will be provided using high efficency chillers.

5. The possibility of night time purging of the office spaces will be investigated during the detailed design stages of the project.

4. LED lighting and energy efficient services have been specified for the development, reducing the internal heat gains within the spaces (refer Section 4.0 Sustainability).

5. Internal operating temperature ranges will be from 22-25o C as per CIBSE guidance.

Conclusion

All appropriate passive measures have been implemented to reduce the cooling demand before consideration has been given to energy efficient air conditioning.

Windows are not over-sized and solar control glazing is proposed to all new replacement windows which will remain operable for natural passive cooling during spring and autumn.

Given the location of the building and In order to maintain adequate comfort levels, acoustics and indoor air quality, all the spaces within the buildings are intended to be comfort cooled to offset remaining heat gains using high efficient chillers.

6.3 Technical Submission - Solar Control Glazing Specification

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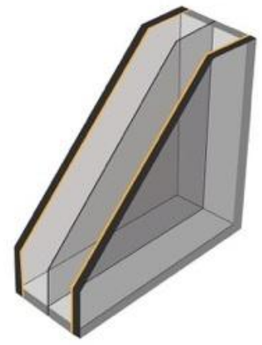
CUIN Eco

Specification
4mm low e 1.1 outer
14mm Argon
CUIN transparent film
14mm Argon
4mm low e 1.1 inner



IGU thickness :	36 mm
IGU weight:	20 kg/m2 (glass weight)

Light

Light transmission:	70%
Light reflection:	18%

Solar

Direct transmission:	39%
Reflection:	38%
Absorption:	23%
g-value:	45%

Shading Coefficient

Total:	0.52
Short wave:	0.44
Long wave:	0.08

Heat transfer

U value:	0.6 W/m²K

Light and solar data is determined in accordance with EN 410, U-value with EN 673.