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Gloucester Lodge – Response to Camden Council's comments regarding overheating

XCO2 have revisited the overheating risk mitigation strategy for The Link following receipt of Camden Council's Statement of Case for the appeal. The Council's Statement of Case states that the Cooling Hierarchy has not been adequately applied and that the strategy relies on venting heat to the existing house, thus increasing the risk of overheating of the host property. It is recognised that overheating risk mitigation opportunities are partially constrained by the glazing design, however we feel that overheating risk has been mitigated as far as possible via application of the Cooling Hierarchy, through carefully considered shading and ventilation measures as described. The below summary builds upon the previously outlined strategy, clarifying how compliance is achieved through application of the Cooling Hierarchy.

The design of The Link incorporates the priorities of the Cooling Hierarchy, through a series of passive design measures following the hierarchy steps as outlined below. The first aspects to note are that The Link is predominantly north facing, and that solar control glazing with a low g-value is proposed to reduce solar transmittance, before additional ventilation measures have been incorporated.

Glass fritting has been specified to provide shading, along with internal blinds on the south side up to the roof apex, to limit solar gains into the space. This reduces the amount of heat entering the building in line with the first step of the Cooling Hierarchy, without compromising the aesthetic value and external visual impact of the proposal.

Ventilation is also a key component of the strategy to alleviate any heat buildup during spells of hotter weather. The strategy no longer relies on any ventilation to adjacent spaces and utilises the courtyard door on the ground level to provide daytime ventilation to the space. It is also proposed that a door between The Link and host property is installed to ensure these can be thermally separated, ensuring no additional overheating risk to the host property.

Furthermore, ventilation grilles on either side of the bespoke glazed façade are being proposed to allow greater levels of ventilation to reduce overheating risk further and has been modelled showing positive results. Although this would be a bespoke solution to be developed during the next design phases, an indicative flow rate of 5 litres per second to the space is proposed to ensure compliance can be achieved.

Based on a conservative wind speed of 2 m/s, this would require 2,500mm^2 equivalent area of ventilation to be achieved, which would be typical of a 300-400mm trickle vent, and therefore it is expected that the locations and areas currently shown on the architectural drawings for ventilation grilles would provide sufficient space to accommodate the necessary ventilation rate.

Whilst The Link is a circulation space for which mandatory overheating criteria does not apply, following the implementation of these mitigation measures, the space is able to achieve compliance with the optional CIBSE TM59 criteria by meeting an average internal temperature of < 28°C for < 3% of annual hours.

Table 1: Summary of proposed measures in line with London Plan Cooling Hierarchy

Measure	Implementation
1. Minimise internal heat generation through energy efficient design	
High efficiency lighting installation	High efficiency LED lighting will be installed to minimise heat gains. It is also expected that the demand for artificial lighting will be very low due to the high levels of natural daylight within the proposed building.
Negligible equipment gains	Due to the nature of the space, there is not expected to be any additional equipment such as plug-in devices that would contribute to internal heat gains.
2. Reduce the amount of heat entering the building in summer through orientation, shading, albedo, fenestration, insulation and green roofs and walls	
Solar control glazing	The Link will incorporate solar control glazing to achieve g-value = 0.30 (through thin film or glazing specification).
Glass fritting	Use of fritting on glass to reduce solar transmittance. 90% fritting at south glazed wall, gradually reduced to 50% fritting up to apex of glazed roof.

Internal blinds	Shading from internal blinds up to roof apex, to minimise excessive solar gains further. A shading coefficient of 0.20 has been applied in the model, and assumed to be in in operation when incident irradiance exceeds 200 W/m^2.
3. Manage the heat within the building through exposed internal thermal mass and high ceilings	
Thermal mass	The use of exposed high thermal mass materials for the masonry walls and proposed walkway link will assist in reducing diurnal temperate ranges within the space by absorbing excess heat during the day and releasing during the night.
High ceilings	The Link is a double height space which allows greater levels of air circulation to reduce the impact of heat build-up.
4. Passive ventilation	
Open courtyard door	During spells of hot weather, the door to the courtyard will be opened to allow air flow. This has been modelled within the overheating assessment when the internal temperature exceeds 22°C.
Ventilation grilles	The Link will incorporate ventilation grilles for passive ventilation, to be operated when necessary. A total flow rate of 5 l/s has been applied in the model.
5. Mechanical ventilation	
Not proposed. This step of the hierarchy is not required since TM59 criteria are already met through passive solutions.	
6. Active cooling systems	
Not proposed. This step of the hierarchy is not required since TM59 criteria are already met through passive solutions.	

Table 2: Overheating assessment iteration results for London Weather Centre DSY1, 2020s, high emissions, 50% percentile

ID	Design change	Glazing g-value	Glass Fritting	Internal Blinds	Corridor TM59 hours above 28°C criterion	Pass/Fail
1	Base Design. G-value 0.63, no glass fritting.	0.63	N	N	38.6%	Fail
2	Reduce g-value to 0.50.	0.50	N	N	33.0%	Fail
3	Glass fritting incorporated for south facing and roof glazing.	0.50	Y	N	18.9%	Fail
4	Reduce g-value to 0.30.	0.30	Y	N	10.5%	Fail
~~5~~	~~Introduce internal blinds on south facing roof up to apex, and allow for ventilation to adjacent spaces through door openings.~~	*Cancelled iteration.*				
6	Introduce internal blinds on south facing roof up to apex, and allow ventilation through courtyard door.	0.30	Y	Y	3.3%	Fail
7	**Introduce ventilation grilles to achieve flow rate of at least 5 l/s.**	**0.30**	**Y**	**Y**	**2.9%**	**Pass**