

**15 SHORTS GARDEN & 2-3 NEALS YARD
CAMDEN COOLING HIERARCHY COMMENTARY**

CPG Cooling Hierarchy Reference	Option Considered	Viability
1	Layout	Restaurant cold rooms will be provided by the incoming tenant in the basement away from windows & solar gains, therefore confining the areas that require the greatest level of cooling to the coolest areas of the floorplate.
1	Reduce Heat Gains	The restaurant is a shell and core fit-out only but the incoming tenant will be required to provide a lighting design with 100% low energy consuming LED fittings with occupancy sensing reduce energy consumption.
1	Seal / Insulate	<p>Restaurant cold rooms will be provided by the incoming tenant in the basement away from windows & solar gains, therefore confining the areas that require the greatest level of cooling to the coolest areas of the floorplate.</p> <p>Cold rooms will be thermally insulated to meet current regulations to ensure minimum energy consumption</p>
1	Reduce Distances	All refrigerant pipework will be thermally insulated to maximise efficiency of their respective systems. The condensing units will be located in the central lightwell which is the shortest practicable route for refrigerant pipework, therefore minimising uncontrolled heat losses from pipework
1	Layout Design	The building is existing and it is therefore not possible to alter the internal layouts significantly.
1	Evaporative Cooling	This type of cooling is not suitable for this property due to insufficient external plant space allowances for such a system
1	Night Cooling	<p>Night cooling via openable windows is not considered a viable strategy in this location due to security risks. However, restaurant mechanical ventilation systems could be utilised through the night to reduce reliance on air conditioning but will not be sufficient to eliminate the requirements during peak times due to the high internal loads that cannot be reduced further.</p> <p>The tenant will configure the restaurant ventilation systems to utilise free daytime cooling where practicable (dependant on the external ambient temperature being lower than the internal temperature).</p>

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2	Sun angle	The building is existing and it is therefore not possible to alter the angle of sun into the property.
2	Orientate and Recess Windows	The building is existing and it is therefore not possible to alter the orientation nor recess the windows into the property.
2	G Values and Window Details	<p>The existing glazing to the restaurant areas will be retained. This could be provided with solar film to reduce direct solar gains, but this will not eliminate the requirement for active cooling and could impact on the visibility of the unit. There is minimal glazing on East, South and West elevations, and the rooflight in the lightwell is deeply recessed in the lightwell and will be shaded in all but the highest of sun positions.</p> <p>The existing rooflight is being reduced in size by approximately 50%.</p> <p>The building is existing and it is therefore not viable to alter the proportion, size or location of the windows at the property.</p>
2	Shadowing	The building is existing and it is therefore not possible to utilise additional shading from other buildings.
2	Shading	<p>Blinds are not suited to restaurant use preventing view in and view out of the space.</p> <p>The incoming tenant could potentially install an awning on the Shorts Garden elevation which will provide a small reduction in direct solar gain to this small area of the unit. Awnings will have no impact on internal loads. The internal loads are greater than can be dealt with via natural ventilation and therefore overheating is still a problem.</p> <p>A brise soleil is not suited to the ground floor windows of this unit.</p> <p>The building is existing and there is no viable external space to introduce vegetation.</p>
2	Albedo Effect	<p>There is no opportunity to implement a reflective roof over the restaurant areas to reduce cooling loads as there are other floors above the restaurant.</p> <p>The external walls impacted by solar gains on the Shorts Garden elevation are 100% existing shopfront.</p>
2	Green Roof	No opportunity to implement a green roof over the restaurant areas to reduce cooling loads due to the other floors above.

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3	Thermal Mass	The available thermal mass of the existing building will be utilised in the restaurant space by utilising their mechanical ventilation systems through the night to reduce reliance on air conditioning. However, this will not be sufficient to eliminate the requirements during peak times due to the high internal loads that cannot be reduced further.
4	Natural Ventilation	Windows & Doors. The existing shopfronts at ground floor level contain openable elements which will provide natural crossflow ventilation.
4	Design Layouts	The building is existing and it is therefore not possible to alter the internal layouts significantly, including no possibility to increase floor to ceiling heights.
4	Evaporation Cooling	This type of cooling is not suitable for this property due to insufficient external plant space allowances for such a system
4	Night Cooling	Night cooling via openable windows is not considered a viable strategy in this location due to security risks. However, restaurant mechanical ventilation systems could be utilised through the night to reduce reliance on air conditioning but will not be sufficient to eliminate the requirements during peak times due to the high internal loads that cannot be reduced further.
5	Mechanical Ventilation	<p>The restaurant is a shell and core fit-out only but the incoming tenant will be required to provide mechanical ventilation systems with heat recovery where practicable in order to comply with Building Regulations. The units will be modern equipment with optimum specific fan powers and heat recovery efficiencies to reduce energy consumption. MVHR units will have summer bypasses to provide free cooling.</p> <p>Natural ventilation will be utilised by the tenant in conjunction with the mechanical ventilation systems to provide a 'mixed mode' ventilation strategy.</p>
5	Heat Recovery	<p>The restaurant is a shell and core fit-out only but the incoming tenant will be required to provide mechanical ventilation systems with heat recovery where practicable in order to comply with Building Regulations. The units will be modern equipment with optimum specific fan powers and heat recovery efficiencies to reduce energy consumption. MVHR units will have summer bypasses to provide free cooling.</p> <p>Natural ventilation will be utilised by the tenant in conjunction with the mechanical ventilation systems to provide a 'mixed mode' ventilation strategy.</p>

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6	Lowest Carbon Options	<p>The heat pumps proposed and that will be required from tenant installations will be modern equipment with variable speed compressors, with the highest EER/COPs possible to ensure these are the lowest carbon solutions.</p> <p>The proposed system will incorporate heat recovery (via a 3-pipe VRF system) to reutilise otherwise wasted energy.</p>
6	Reversible Heat Pumps	The heat pumps proposed are reversible and will provide space heating during winter as well as cooling during peak summer conditions.
6	Water Based System	There is insufficient external space to incorporate a water based air conditioning system, therefore water based cooling systems of this type are not considered viable for this scheme.
Additional	Load Shedding	The restaurant has openable shopfronts which will be used for load shedding to provide cooling outside of peak periods where air conditioning will supplement the natural ventilation.
Additional	PV	No opportunity to implement a PV array on the roof to assist in powering the air conditioning plant as the available roof space allocated to the restaurant tenants is only sufficient to house their external condensing units and heavily shaded in the lightwell