**Maple Place: Cooling Hierarchy Compliance Statement**

This Statement has been prepared in support of proposals for replacement and new plant at 1-5 Maple Place. This Statement has been prepared with input from the wider team who are providing services advice on the project.

1. **Cooling Hierarchy** 
   1. **London Plan**

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| **Policy SI 4 - Managing Heat Risk**  Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.  Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:   * Reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure * Minimise internal heat generation through energy efficient design * Manage the heat within the building through exposed internal thermal mass and high ceilings Provide passive ventilation * Provide mechanical ventilation * Provide active cooling systems |

The policy requires that passive ventilation should be prioritised, taking into account external noise and air quality in determining the most appropriate solution. The increased use of air conditioning systems is not desirable as these have significant energy requirements and, under conventional operation, expel hot air, thereby adding to the urban heat island effect. If active cooling systems, such as air conditioning systems, are unavoidable, these should be designed to reuse the waste heat they produce.

* 1. **Camden Council**

The Local Plan states that:

* Active cooling (air conditioning) will only be permitted where its need is demonstrated and the steps in the cooling hierarchy are followed (Local Plan policy CC2).
* Development is expected to reduce overheating risk through following the steps in the cooling hierarchy. All new development should submit a statement demonstrating how the cooling hierarchy has been followed (Local Plan policy CC2).
* All developments should seek opportunities to make a positive contribution to green space provision or greening.

**Cooling hierarchy**

All developments should follow the cooling hierarchy outlined below, to reduce the risk of overheating and subsequent reliance on active cooling:

1. Minimise internal heat generation through energy efficient design, considering the following:

• Layout and uses: locate any spaces that need to be kept cool or that generate heat on cooler sides of developments.

• Reducing heat gains e.g. including low energy lighting.

• Seal/ insulate heat generating processes.

• Reduce the distance heat needs to travel and insulate pipework.

• Design layouts to promote natural ventilation e.g. shallow floor plans and high floor to ceiling heights.

• Consider evaporation cooling which cools air through the evaporation of water.

• Consider ‘free cooling’ or ‘night cooling’, which uses the cooling capacity of ambient air to directly cool the space.

1. Reduce the amount of heat entering a building in summer:

• Consider the angle of the sun and optimum daylight and solar gain balance.

• Orientate and recess windows and openings to avoid excessive solar gain.

• Consider low g-values and the proportion, size and location of windows.

• Make use of shadowing from other buildings.

• Include adequate insulation.

• Design in shading: e.g. include internal courtyards, large shade-providing trees and vegetation, balconies, louvers, internal or external blinds, and shutters.

• Make use of the albedo effect (use light coloured or reflective materials to reflect the sun’s rays).

• Include green infrastructure e.g. green wall, green/blue roofs and landscaping, to regulate temperatures.

• Reduce the amount of heat entering a building in summer.

1. Manage the heat within the building through exposed internal thermal mass and high ceilings.
2. Passive ventilation:

• Natural ventilation, openable windows, the ‘stack effect’ system

• Design layouts to promote natural ventilation e.g. shallow floor plans and high floor to ceiling heights.

• Consider evaporation cooling which cools air through the evaporation of water.

• Consider ‘free cooling’ or ‘night cooling’ which uses the cooling capacity of ambient air to directly cool the space

1. Mechanical ventilation:

• Ensuring the most efficient system possible.

• Consider mechanical ventilation with heat recovery

1. Active cooling:

• Ensuring they are the lowest carbon options.

• Ground Source Heat Pumps and Air Source Heat Pumps can be used in reverse to provide cooling to buildings.

• Water based cooling systems also reduce the need for air conditioning by running cold water through pipes in the floor and/or ceiling to cool the air.

1. **Maple Place Design Compliance**

The objective of this section is to demonstrate compliance of the proposed works for new plant equipment at Maple Place with the policies presented above.

* 1. **Cooling Hierarchy – Design Principles**

The following is a summary of the passive design features applied to the building with the aim to minimise the need for cooling.

* The application proposals relate to an existing building and opportunities to alter the levels of glazing to the building are minimal.
* The replacement windows to Maple Place will be openable allowing natural ventilation.  However, due to the proximity to a busy road such as Tottenham Court Road there is potential for indoor air quality and acoustic issues associated with relying solely on natural ventilation to provide thermal comfort. Therefore, energy efficient air conditioning will be considered.
* The use of internal blinds will be considered to reduce the effects of solar gains and heat transmission through the facade.
* LED lighting and energy efficient services will be specified reducing the internal heat gains within the spaces.

In order to maintain adequate comfort levels, acoustics and indoor air quality, the existing condensers are proposed to be replaced. No additional capacity is proposed. These new units will be significantly more energy efficient than the existing units.

1. **Conclusion**

The Cooling Hierarchy has been fully considered and all appropriate passive measures have been implemented to reduce the cooling demand before consideration has been given to energy efficient air conditioning.

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 a highly efficient system.