MorenoMasey

Cooling Hierarchy Statement

27 April 2022

Site Address:

Parker Street 12-16 Market House Flat 6

To address the Council's requirement under Policy CC2 and the 2021 adopted Energy Efficiency and adaptation SPD, the following information is provided in relation to the cooling hierarchy of flat 6 and the annexe of 12-16 Market House, Parker Street.

Due to the site constraints of the existing building being a block of flats and the application relating to the top floor units, intervention to reduce reliance on active cooling is limited. The application site is an established building located within a conservation area. The opportunities to significantly alter the design of the building to address the design principles of the Cooling Hierarchy are severely limited. As such, the measures employed are limited to retro-fitting the building, and more specifically the application site (as the Applicant has no control over the other units or the communal areas of the building).

Nevertheless, all possible measures to reduce the requirement for active cooling have been undertaken and are addressed below. These measures are not sufficient to negate the need for mechanical cooling in the form of 1no AC condenser unit cooling 2no existing bedrooms but the extent of the provision is limited to that absolutely necessary for the particular constraints and characteristics of the site. Our responses to the Cooling Hierarchy process are detailed in italics below.

Cooling hierarchy process

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. *The 2no bedrooms are located on the east and west sides of the building. The ability to reconfigure the space is limited due to the other units in the building but spaces that need to be kept cooler are in the coolest locations possible.*

- Reducing heat gains e.g. including low energy lighting. All opportunities to reduce heat gains have been employed. *As part of the refurbishment works, all lighting will be altered to low energy with controlled sensors.*
    - all other materials, appliances and fixtures will be energy efficient and energy rated excellent (A+) wherever possible to further reduce heat gains.

  - Zoned lighting, heating and cooling with individual controls will be installed to reduce the energy consumption of the flat.
  - Energy monitoring, metering and controls will be used to inform and facilitate changes in user behaviour.

- Seal/ insulate heat generating processes. *Under a separate application, all existing windows are being replaced to improve the energy efficiency of the units to reduce heat/cooling losses.*

- Reduce the distance heat needs to travel and insulate pipework. *As part of the refurbishment works, all pipework that is within the Applicant's control will be insulated*

- Design layouts to promote natural ventilation e.g. shallow floor plans and high floor to ceiling heights. *As an existing building, the opportunities for this are limited within the existing building envelope.*

- Consider evaporation cooling which cools air through the evaporation of water. *Due to the site constraints, this is not possible.*

- Consider 'free cooling' or 'night cooling', which uses the cooling capacity of ambient air to directly cool the space. *Due to the site constraints of the existing building, this is not possible as a simple refurbishment of the existing flat.*

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

- Consider the angle of the sun and optimum daylight and solar gain balance. *As a simple refurbishment of an existing dwelling within a block of flats, opportunities to alter the relationship of the building with the sun are severely limited.*

- Orientate and recess windows and openings to avoid excessive solar gain. *As a simple refurbishment of an existing dwelling within a block of flats located in a conservation area, opportunities to alter the relationship of the window openings are severely limited.*

- Consider low g-values and the proportion, size and location of windows. *As a simple refurbishment of an existing dwelling within a block of flats located in a conservation area, opportunities to alter the relationship of the window openings are severely limited.*

- Make use of shadowing from other buildings. *As a simple refurbishment of an existing dwelling within a block of flats located in a conservation area, opportunities to alter the relationship of the building and its neighbours are severely limited.*

- Include adequate insulation. *As part of the refurbishment works, all opportunities to insulate the building will be taken.*
- Design in shading: e.g. include internal courtyards, large shade-providing trees and vegetation, balconies, louvers, internal or external blinds, and shutters. *Under a separate application, a solar blind has been proposed to reduce the heat gain within the reception spaces. In addition, internal window treatments will be installed to reduce heat gains into spaces through the use of blinds and curtains.*

- Make use of the albedo effect (use light coloured or reflective materials to reflect the sun's rays). *The interior design of the unit will make use of the albedo effect wherever possible.*

- Include green infrastructure e.g. green wall, green/blue roofs and landscaping, to regulate temperatures. *As a simple refurbishment of an existing dwelling within a block of flats located in a conservation area, opportunities to include these items are severely limited.*

- Reduce the amount of heat entering a building in summer. *The measures detailed above such as internal blinds and the external sun shade will help reduce how much sun is entering the building.*

3. Manage the heat within the building through exposed internal thermal mass and high ceilings.

- *This is an existing flat within a block of other flats. There is little opportunity to significantly alter floor to ceiling heights as suggested.*

4. Passive ventilation:

- Natural ventilation, openable windows, the 'stack effect' system *All windows are openable.*

- Design layouts to promote natural ventilation e.g. shallow floor plans and high floor to ceiling heights. *The layout of the building cannot be significantly altered but the floor plan is relatively shallow with the opportunity to create through breezes with windows on three sides of the building.*

- Consider evaporation cooling which cools air through the evaporation of water. *Due to the site constraints, this is not possible.*

- Consider 'free cooling' or 'night cooling' which uses the cooling capacity of ambient air to directly cool the space *Due to the site constraints of the existing building, this is not possible as a simple refurbishment of the existing flat.*

5. Mechanical ventilation:

- Ensuring the most efficient system possible. *The system proposed is the most efficient possible and the smallest possible to achieve the desired outcomes.*

- Consider mechanical ventilation with heat recovery

6. 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. *Due to the constraints of the site being a top floor flat within a block of other flats, it is not possible to install these measures.*

- 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. *Due to the constraints of the site being a top floor flat within a block of other flats, it is not possible to install these measures within areas demised to the Applicant.*