

## Cooling Hierarchy Covering Letter (Planning Application)

Project Name:	50-52 Monmouth Street (Ground and Basement Restaurant)		
Project No:	P2783	Rev:	01
Issued:	22/03/2024	Engineer:	DC

As part of the planning application for the refurbishment works of the ground floor and basement restaurant unit at 50-52 Monmouth Street, QuinnRoss have undertaken an assessment of the internal heat losses and heat gains associated with the potential usage of the space. At present both levels of the existing restaurant, and the first floor (proposed to be converted to office use), are provided with air conditioning.

The assessment of heat losses is a relatively simple steady state calculation based on fabric data and the external design criteria during summer. Based on this calculated load various heat generating sources were reviewed and air source (air-to-air) heat pumps were considered the most optimal solution in terms of their efficiency, lack of contribution to local air pollution (no use of fossil fuels), and their minimal external plant space requirements. Variable Refrigerant Flow (VRF) type air source heat pump units are proposed for heating and cooling. These units have been selected as the most appropriate and sustainable means of heating/cooling for the proposed space.

With regards to heat gains and the provision of comfort cooling, the cooling hierarchy under the London Plan is thoroughly considered, and as with all our projects we only recommend active cooling where necessary.

As the fabric is largely existing and being retained the 'lean' measures applicable to the refurbishment are largely restricted to the building services design, although new windows and awnings are proposed. As part of the design, LED lighting is proposed to limit internal heat gains.

As the fabric is existing, with no proposed change to the overall building height proposed, it is not possible to provide high floor to ceiling levels. Whilst limited, existing fabric elements with high thermal mass shall be left exposed and this has been considered within our heating and cooling assessment.

The new ground floor windows are proposed to be fixed and there are no windows or passive vents at basement level and therefore natural ventilation is not viable to meet the ventilation requirements for the occupants or to offer any cooling benefit. Allowance for mechanical ventilation will be made for the unit to ensure sufficient fresh air can be provided for the potential occupants and will offer periods of free cooling when external temperatures allow, reducing the annual cooling demand. However, the volume of air introduced will offer limited cooling benefit in peak summer conditions when 30°C+ air would be being introduced, without active cooling.

As the unit is intended for restaurant use and therefore will likely contain a kitchen, the anticipated heat gains are high and based on the limitations noted above it is deemed that there is a requirement for active cooling to be provided to meet the peak summer conditions. This will allow the space to be suitable for use by incoming tenants and their customers. Figure 1 sets out the anticipated high cooling loads for restaurants and retail spaces.

Description	Rule of thumb
	Cooling load (W/m <sup>2</sup> )
Restaurants	200
Retail establishments	140

Figure 1 - Extract from BSRIA Rules of Thumb 5th Ed. (Table 16)

As an air source heat pump is proposed to provide space heating, QuinnRoss have proposed utilising the same system in reverse to provide cooling benefit during peak summer conditions. The external units shall be located in place of existing air conditioning equipment in an enclosure on the roof of the building. The condensing units will be sized to meet the heating load and will be selected from among the most space efficient available on the market.

Based on previous experience on similar projects of a comparable scale in the local area we can confirm that thermal modelling will not yield different results that would result in comfort cooling not being required to achieve suitable internal temperatures during the summer months.

The units proposed will be of the current generation with the latest energy efficient technology and feature a refrigerant with zero ozone depletion potential (ODP) and low global warming potential (GWP).

All works will be undertaken to the highest standards and 'best practice' procedures to ensure the highest environmental and energy efficient rating (and improvement upon the existing).

Signed on behalf of QuinnRoss Consultants Ltd:

Name: Daryl Curtis  
 Tel: 01795 841 035  
 Email: dcurtis@quinnross.com