Cooling Hierarchy Covering Letter (Planning Application)

Project Name:	50-52 Monmouth Street (First Floor Office)		
Project No:	P2783	Rev:	01
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As part of the planning application for the redevelopment of First Floor 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 this area is part of a restaurant unit over three floors, all of which have air conditioning, and is to be converted to office use.

The assessment of heat losses is a relatively simple steady state calculation based on fabric data and the external design criteria during winter. 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 existing and being retained the 'lean' measures applicable to the refurbishment are largely restricted to the building services design. 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.

Natural ventilation is proposed for the office space which will have the ability for cross-ventilation via windows in opposite façades and this is sufficient to meet the fresh air requirements for the occupants. However, it is insufficient to meet the peak cooling load and must therefore be supplemented. Refer to Figures 1 & 2 below for maximum cooling capacity of natural ventilation and cooling loads of office spaces.

Description	Rule of thumb	Comments
	Measurement of ventilation system area	
Maximum cooling capacity of a natural ventilation system	40 W/m^2	A natural ventilation system is unlikely to cope with heat gains exceeding 40 W/m^2

Figure 1 - Extract from BSRIA Rules of Thumb 5th Ed. (Table 15)

Description	Rule of thumb
	Cooling load (W/m^2)
Offices	87

Figure 2 - Extract from BSRIA Rules of Thumb 5th Ed. (Table 16)

Due to the limited floor to ceiling heights, mechanical ventilation with high level ductwork is not considered suitable and natural ventilation only shall be provided.

As the unit has a proposed office use the heat gains are high and based on the 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 spaces to be suitable for use by incoming tenants and their employees.

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 unit shall be located in place of existing air conditioning equipment in an enclosure on the roof of the building. These 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).

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