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THE GEORGE HOTEL SUPPLY AND EXTRACT VENTILATION STATEMENT

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EXECUTIVE SUMMARY

The George Hotel will be ventilated by a combination of systems in accordance with the appropriate standards and operational specifications, ensuring the correct level of fresh air is introduced to and stale air removed from the various areas of the hotel.

Natural Ventilation.

Natural ventilation to the central atrium will be achieved through automated openings at high level within the roof construction, controlled via averaging CO₂ sensors monitoring the parts per million of CO₂ (PPM) within the space.

Each bedroom will incorporate an opening window to provide the option of natural ventilation when external conditions permit. Each bedroom will also incorporate a mechanical ventilation solution.

Mechanical Ventilation

With the exception of the atrium the entire hotel will be provided with mechanical ventilation, complete with high efficiency heat recovery. Fresh air will be tempered via the transfer of heat from the exhaust air, and further heated by a heating coil via air source heat pumps. The fresh air volume to each space will be controlled via temperature and CO₂ sensors to ensure optimised performance is achieved both in terms of energy efficiency and air quality.

A dedicated mechanical ventilation system will be provided for the kitchen ensuring the correct pressure regime and air change rate is achieved within the kitchen and associated ancillary areas.

A dedicated smoke extract system will be provided to the atrium area. Supply and extract fans will ensure smoke is effectively cleared from the atrium space in the event of a fire. Fresh supply air will be delivered via a roof mounted fan to a dedicated shaft which drops through the atrium to the ground floor, smoke will be extracted at high level via a roof mounted extract fan, as in accordance with the fire strategy.

1. INTRODUCTION

The supply and extract ventilation system statement has been compiled to summarise the proposed ventilation strategies being developed for The George Hotel to support the planning application. The hotel consists of various areas and room types, the ventilation strategies have been considered and developed to meet the requirements of each space, ensuring compliance with relevant standards and specifications, whilst also ensuring that the operational control of each system is optimised for both effectiveness and efficiency.

2. NATURAL VENTILATION

Atrium

The atrium is intended to be naturally ventilated. High level automated openings within the roof structure will enable fresh air in and exhaust air out, complete with heat recovery. Averaging temperature and CO₂ sensors interfaced with the BEMS will monitor the atrium space controlling the status of the automated openings ensuring the introduction of fresh air maintains the pre set CO₂ ppm levels, whilst optimising efficiency.

Bedrooms

Each bedroom will incorporate an opening window to provide the option of natural ventilation when external conditions permit. Each bedroom will also incorporate a mechanical ventilation, heat recovery solution. There are two mechanical ventilation strategies proposed for the bedrooms described in the next section of the report

3. MECHANICAL VENTILATION

Bedrooms

Central mechanical ventilation with heat recovery - a central air handling unit mounted on the roof will provide fresh supply and stale extract air via a ducted system to bedrooms and ensuites within the listed areas of building. A central system has been selected to serve the listed areas of the building to prevent the need for numerous penetrations through the listed façade

Localised mechanical ventilation and heat recovery – ceiling void mounted MVHR units will provide supply and extract air to individual bedrooms and ensuites. Each room will draw fresh air and exhaust stale air through the new façade via a ducted system and louvres.

Offices & Meeting/Conference Rooms

Offices and meeting rooms will be mechanically ventilated via a combination of central air handling units or localised MVHRs. The location of each of the rooms will determine the ventilation strategy utilised. For either strategy the operation of the system will be optimised by a combination of VAV boxes (central AHU) together with CO₂ sensors interfaced with the BEMS.

Gym

The gym is located within the basement of the listed building, ventilation will therefore be provided by a central AHU complete with heat recovery, located on the roof with supply and extract air distributed via a ducted system. A variable air volume box (VAV) linked to CO₂ sensors interfaced with the BEMS will control the fresh air volume to the Gym, The gym may have 24 hour access, therefore the ventilation system will only operate when the gym is occupied and the pre-set CO₂ ppm levels are reached, ensuring that the operation of the ventilation system is optimised.

Restaurant/ Banqueting/Events & Bar

These areas are located within the basement and ground floor of the new build and will be ventilated via a central AHU complete with heat recovery, located on the roof with supply and extract air distributed via a ducted system. Variable air volume boxes (VAV) linked to CO₂ sensors interfaced with the BEMS will control the fresh air volume to the spaces, The ventilation system will only operate when the spaces are occupied and the pre-set CO₂ ppm levels are reached, ensuring that the operation of the ventilation system is optimised.

Kitchens

A dedicated supply AHU and separate extract AHU will deliver fresh air and extract air to the kitchen(s) and ancillary areas via a fire rated ducted system. The central AHU and sperate extract will provide the required air change rates to the kitchen(s) and ancillary areas. The ventilation system will be operated based on a usage profile and time schedule controlled via the BMS to ensure the appropriate air change rate is achieved whilst the kitchen is in use. The ventilation system will be designed and commissioned to ensure the correct pressure regime is set up, the kitchen will be maintained under a negative pressure to ensure the odours emanating from the kitchen(s) are contained and do not escape into other areas of the hotel. The exhaust air will be discharged at roof level at relatively high velocity to ensure it sufficiently clears the building and any air intakes.

Bin Stores

A localised extract system will be provided to ensure and odours are contained within the bin store, the soiled air will be discharged at roof level. Fresh air will be drawn in via wall mounted louvres. The ventilation system will be operated based on a time schedule via the BMS.

WCs

Dedicated MVHR units mounted on the roof or within bulk heads will extract air from each WCs via a ducted system, useful heat will be recovered and transferred back into the makeup air supplying fresh air to the WCs (without mixing of air streams). The ventilation systems will be operated based on PIR presence sensors interfaced with the BMS. When the WCs are not in use the ventilation systems will provide 'trickle' ventilation, on occupancy the PIRs will detect a presence and the ventilation will 'boost' increasing the air change rate, following a pre-set run on period the ventilations systems will drop back to 'trickle'.

4. SMOKE EXTRACT

A smoke extract system will be provided to the atrium area, as in accordance with the fire strategy. The smoke extract system is a dedicated system and does not form part of the general ventilation strategy for the hotel. The system will be utilised to clear smoke in the event of a fire.

A supply fan located on the roof will deliver fresh air down a dedicated shaft which runs from roof level to the ground floor. Extract will be drawn at high level via a roof mounted extract fan, smoke discharged at relatively high velocity to ensure smoke sufficiently clears the building and any air intakes.

5. AIR QUALITY

In all scenarios the mechanical ventilation systems will be designed in accordance with the operational specifications and standards applicable.

The mechanical ventilation systems will deliver the correct level of fresh supply air to each space, with the corresponding stale air being extracted and discharged from the building.

Incoming fresh air will be appropriately filtered as it passes through the air handling units and localised MVHR units, removing air borne particles from the supply air.

Fresh air intake louvres and exhaust air outlet louvres will be positioned to ensure short circuiting between the inlets and outlets does not occur ensure a high level of air quality is maintained

6. ACOUSTIC REQUIREMENTS

All fresh air inlet and exhaust air outlet ductwork associated with the central air handling units and localised MVHR units will incorporate attenuators. The attenuators will prevent external noise from "breaking in" via the ductwork distribution systems, ensuring that the specified acceptable noise criteria identified within the operational specifications for each individual space is achieved.