MEP Strategy Submission Report

GMI Construction / Queensbury

Project: Radisson Red, George Hotel, Huddersfield

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1. Introduction

This Ventilation Strategy Report has been prepared to support the planning submission for the proposed Radisson RED Hotel development in Huddersfield. The purpose of this report is to outline the design intent and performance requirements for ventilation across the development, ensuring that the internal environment will be healthy, comfortable, and compliant with current building regulations and best practice guidance.

The Radisson RED project involves the refurbishment of the existing historic George Hotel along with a new-build extension, collectively providing 110 guest bedrooms, public spaces including a restaurant and bar, meeting rooms, gym facilities, and back-of-house service areas. Given the mixed-use nature and varied occupancy types within the building, a robust and carefully coordinated ventilation strategy has been developed to ensure suitable indoor air quality is maintained throughout.

The proposed strategy combines both centralised and localised mechanical ventilation systems, tailored to the specific needs of each area of the hotel. The approach has been informed by acoustic constraints, fire safety requirements, spatial coordination, and sustainability targets including BREEAM and Part L compliance. Key aspects of the design include the use of Mechanical Ventilation with Heat Recovery (MVHR) units within guest bedrooms, central Air Handling Units (AHUs) for communal spaces, dedicated extract systems for WCs, kitchens and a Supply & Extract Fan system for the basement which will have a multipurpose function for Smoke Extract Ventilation.

This report sets out the ventilation provisions in detail and demonstrates how the proposed systems will meet the relevant performance criteria.

2. Design Standards and Guidance

The ventilation strategy for the Radisson RED Hotel has been developed in accordance with current legislation, recognised industry standards, and specific client and brand requirements. The design ensures that ventilation systems deliver appropriate levels of fresh air, occupant comfort, and energy efficiency while meeting health, safety, and environmental obligations.

The following standards and guidance documents have been referenced in the strategy:

Building Regulations Approved Document Part F (Ventilation)

Building Regulations Approved Document Part L (Conservation of Fuel & Power)

CIBSE Guide B, CIBSE TM40 – Health & Wellbeing in Building Services

British Standards BS EN13779:2007 – Ventilation for Non-Residential Buildings

BESA DW/144 – Specification for Sheet Metal Ductwork

DW/172: Specification for kitchen ventilation systems

DW/145 – Guide to Good Practice for the Installation of Fire and Smoke Dampers

BREEAM Construction 2018 – Environmental Assessment Method

Radisson brand standards

3. Ventilation Principles

Mechanical Ventilation Systems Block A

Bedrooms

All guest bedrooms will be provided with localised Mechanical Ventilation with Heat Recovery (MVHR) units, discreetly installed within the bathroom ceiling voids. These units are connected to the room's keycard system, ensuring that ventilation operates correctly, 24l/s (boost) when keycard is activated and trickle ventilation without the card, thereby enhancing energy efficiency. The units will blow fresh air on to the back of the Fan Coil Unit that is heating/cooling the space and extract shall be done via an air valve in the Shower area. Fresh air intake and exhaust ductwork from each unit will utilise existing chimney flues, which have been repurposed to act as vertical risers. These ducts will terminate to atmosphere with appropriate separation between intake and exhaust points to prevent cross-contamination and maintain indoor air quality.

Signing Room

This space benefits from existing openable windows, and in order to preserve the traditional character and aesthetic of the room, a natural ventilation strategy is proposed. Ventilation will be achieved through the use of these windows, avoiding the need for mechanical systems or visible alterations that could detract from the architectural integrity of the space. This will be subject to C02 build up calculations.

Toilets

These spaces will have a dedicated inline extract fan that will utilise existing chimney flues, which have been repurposed to act as vertical risers. These will be linked to the light switch for the unit to operate, these ducts will terminate to atmosphere via the existing chimney flues.

Basement

The basement has a dedicated supply & extract fan which have been designed to suit both normal operational use and emergency conditions, in accordance with current building regulations and fire safety requirements.

Under normal operating conditions, the basement will be ventilated using a dedicated supply and extract fan system, providing sufficient air changes to maintain acceptable indoor air quality and comfort levels for staff and maintenance personnel.

In the event of a fire, the ventilation system will be configured to provide smoke clearance and purge ventilation, designed to deliver a minimum of 10 air changes per hour (ACH). This is achieved via a high-capacity supply fan and extract fan, with the system controlled by three-point motorised dampers that enable the ventilation mode to switch based on the fire alarm system signal. All ductwork has been sized to 1 Pa/m under normal operations.

To ensure resilience and life safety compliance, both fans will be connected to the building's Uninterruptible Power Supply (UPS) system, maintaining full functionality in the event of a power failure. This aligns with the fire strategy developed for the project and allows the basement to be safely cleared of smoke during emergency conditions.

Mechanical Ventilation Systems Block 1

Ground Floor Common Areas

A centralised Air Handling Unit (AHU) will be provided to serve the primary public and back-of-house areas of the ground floor, including the reception, linen rooms, restaurant, lounge, and other ground floor common areas. The AHU will be located on the mezzanine plant level above the kitchen and has been strategically positioned to ensure efficient duct distribution and reducing the size of service voids needed.

The AHU will be designed to deliver a consistent supply of filtered and tempered fresh air to these high-occupancy spaces, in accordance with CIBSE guidance and Approved Document F.

The AHU ductwork will be routed carefully to maintain spatial coordination with other building services, minimise noise transmission, and preserve ceiling heights. Acoustic attenuation will be provided to ensure internal noise levels remain within acceptable limits, in line with the acoustic report.

Bedrooms

All guest bedrooms within the new-build extension will be served by local Mechanical Ventilation with Heat Recovery (MVHR) units, installed discreetly within the bathroom ceiling voids. The units will blow fresh air on to the back of the Fan Coil Unit that is heating/cooling the space and extract shall be done via an air valve in the Shower area. These units are controlled via the room keycard system, ensuring that ventilation operates correctly, 24l/s (boost) when keycard is activated and trickle ventilation without the card, ensuring the ventilation system operates only when the room is occupied, thereby optimising energy efficiency and reducing unnecessary energy consumption.

Fresh air intake and exhaust ductwork from each MVHR unit will be routed directly to the external façade, terminating via discreet architectural grilles. The positioning of these grilles has been carefully coordinated to maintain the building's visual integrity while ensuring adequate separation between intake and exhaust to prevent cross-contamination and ensure a reliable supply of fresh air to each space.

Circulation & House Keeping Ventilation Zoning and Distribution

Ventilation to the circulation corridors and housekeeping areas throughout the hotel will be provided via a dedicated centralised heat recovery ventilation system, designed to maintain consistent air quality across all floors, the allowance for the circulation spaces will be 0.5ACH as per building regulations.

A roof-mounted Mechanical Ventilation with Heat Recovery (MVHR) unit will serve these spaces, supplying tempered fresh air and extracting stale air from each floor. The system will be ducted vertically through a main riser to serve each level of the building, with both fresh air and exhaust air terminating at roof level via appropriately spaced bird beaks.

This is not currently modelled due to discussions with the Design team regarding the Ventilation, this is to be modelled as a matter of urgency.

Circulation & House Keeping Ventilation Zoning and Distribution

Ventilation to the circulation corridors and housekeeping areas throughout the hotel will be provided via a dedicated centralised heat recovery ventilation system, designed to maintain consistent air quality across all floors, the allowance for the circulation spaces will be 0.5ACH as per building regulations.

4. Energy Efficiency

Energy efficiency has been a key driver in the development of the ventilation strategy for the Radisson RED Hotel, in alignment with the project's sustainability objectives, Part L Building Regulations, and BREEAM requirements.

The ventilation systems across the building have been designed with the following energy-efficient measures:

- Heat Recovery Ventilation: All centralised and local ventilation systems, including the bedroom MVHR units and circulation space ventilation, incorporate high-efficiency heat recovery. This reduces the energy required to condition incoming fresh air by reclaiming heat from the exhaust air stream – All equipment has been selected to meet Heat Recovery figures in Part L documentation.
- Efficient Fan Technology: All fans specified within the AHUs, MVHRs, and extract systems are EC (Electronically Commutated) or equivalent high-efficiency types with variable speed drives. This allows for turndown during periods of low occupancy or demand, further reducing electrical consumption -– All equipment has been selected to meet SFP's figures in Part L documentation.
- Optimised Controls: Ventilation systems are Integrated with the Building Management System (BMS) which ensures optimal control, monitoring, and scheduling.

- Thermal and Acoustic Insulation: All ductwork is appropriately insulated to minimise thermal losses and maintain system efficiency, while also ensuring compliance with acoustic criteria.

5. Maintenance & Access

The ventilation systems for the Radisson RED Hotel have been designed with full consideration for safe, efficient, and practical maintenance access, in line with CIBSE guidance and the requirements of the Health and Safety at Work Act and CDM Regulations.

Key considerations include:

- **Plant Location and Accessibility**:
  Major ventilation plant, such as the central AHU and circulation MVHR units, are located on dedicated roof-level or mezzanine plant areas. These locations allow safe access for maintenance personnel without disruption to hotel operations or guest areas. Safe access routes, working platforms, and adequate lighting will be provided as required.

- **Local MVHR Units in Bedrooms**:
  These are installed within ceiling voids in each bathroom. Access panels will be provided for routine maintenance, such as filter changes and general inspection, in compliance with manufacturer recommendations.

- **Ductwork and Terminal Devices**:
  All ventilation ductwork, grilles, and terminal devices are located to allow for regular cleaning and inspection in accordance with TR19 guidance. Access doors will be incorporated into long duct runs where necessary to enable full system maintenance.

- **Controls and BMS**:
  All major plant will be monitored via the Building Management System (BMS), enabling fault detection, operational status review, and performance monitoring. This supports a proactive maintenance regime and reduces the risk of unplanned downtime.

- **Fire and Smoke Dampers**:
  Where fire and smoke dampers are installed, appropriate access hatches will be provided to allow for periodic testing and maintenance as required under BS 9999 and BS 9991.

The overall design ensures that all ventilation components can be safely and effectively maintained throughout the building's lifecycle, supporting long-term performance, energy efficiency, and compliance with statutory obligations.

6. Conclusion

The ventilation strategy for the Radisson RED Hotel has been carefully developed to meet the functional, environmental, and regulatory requirements of a modern hotel development, while aligning with Radisson brand standards while minimizing visual disruptions, energy efficiency goals, and sustainability aspirations.

A combination of centralised and local mechanical ventilation systems ensures that all areas — from guest bedrooms and circulation spaces to public zones and back-of-house areas — are appropriately served. The use of high-efficiency heat recovery systems, demand-controlled ventilation, and intelligent BMS integration ensures optimal indoor air quality while minimising energy consumption.

The strategy has been coordinated closely with the wider MEP design, architectural constraints, and fire and acoustic requirements to ensure a well-integrated, practical solution. Provisions for ongoing maintenance and access have been built into the design to support operational performance and ease of management throughout the building's lifecycle.

This approach supports the project's objectives for sustainability, compliance with Part L and BREEAM, and ensures a comfortable, safe, and efficient environment for future guests and staff of the Radisson RED Hotel.