MEP Strategy Submission Report

GMI Construction / Queensbury

Project: Radisson Red, George Hotel, Huddersfield

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AMENDMENT RECORD SHEET

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Contents

1. Introduction

This report outlines the Mechanical, Electrical, and Public Health (MEP) design strategy for the proposed Radisson RED Hotel in Huddersfield, prepared as part of the RIBA Stage 3 – Developed Design. The document is intended to support the planning application and to provide an overview of the key building services proposals that underpin the design intent.

Waldeck Consulting (WAL) have appointed our team to undertake the full RIBA Stage 3 and Stage 4 MEP design on behalf of GMI Construction. This report summarises the current Stage 3 outputs and establishes the basis for the subsequent detailed design stages.

2. Project Overview

The proposed development is a new Radisson RED Hotel located in the heart of Huddersfield. The project forms part of a wider regeneration initiative and aims to enhance the local hospitality offering, bringing high-quality accommodation and modern guest facilities to the town centre.

The hotel will provide a total of 110 guest bedrooms, with 31 located within the refurbished section of the historic George Hotel, and the remaining rooms housed within a new-build extension. The scheme has been carefully developed to preserve and celebrate the heritage of the original building, while introducing a contemporary extension that reflects the Radisson RED brand's modern, design-led aesthetic.

In addition to guest accommodation, the hotel will offer a range of complementary amenities including meeting and conference spaces, a restaurant and bar, and a fully equipped gym. These facilities are designed to cater to both leisure and business guests, creating a flexible and vibrant destination.

The development is being delivered on behalf of the Radisson Hotel Group, with GMI Construction appointed as the main contractor, With the Client being Queensway. Waldeck Consulting (WAL) are providing lead consultancy services and have commissioned our team to undertake the full Mechanical, Electrical, and Public Health (MEP) design through RIBA Stages 3 and 4.

The MEP design is being developed in close coordination with the wider design team to ensure full integration with architectural and structural elements. The strategy prioritises energy efficiency, operational reliability, and long-term maintainability, while ensuring compliance with current building regulations and technical standards.

The project is also targeting a **BREEAM rating of 'Good'**, demonstrating a commitment to sustainable construction, responsible energy use, and improved building performance.

3. Design Criteria and Regulations

The Mechanical, Electrical, and Public Health (MEP) strategy for the Radisson RED Hotel development has been designed to meet the key functional and regulatory requirements for a wide range of building services. These include, but are not limited to, the following applications:

- **Thermal Comfort**
- **Ventilation & Indoor Air Quality**
- **Energy Efficiency & Monitoring**
- **Acoustic Criteria**
- **Plumbing & Water Systems**
- **Fire & Life Safety**
- **Power Distribution**
- **Communications Systems**
- **Lighting Systems**
- **Emergency & Standby Power**
- **Earthing & Protection**
- **Controls & BMS Integration**

These applications are critical to ensuring a comfortable, safe, and sustainable environment for all occupants and ensuring operational efficiency throughout the building's lifecycle.

The design has been developed in full compliance with the following standards and regulations, ensuring that the project adheres to industry best practices, legislative requirements, and Radisson Hotel Group's brand standards:

- All related British Standard Specifications and British Standard Codes of Practice.
- Health and Safety at Work Act & Regulations.
- Systems/installations specialist's recommendations for installations, testing and commissioning.
- Local by-laws and regulations.
- Requirements of the Building Control and Fire Officer.
- BSRIA documents including Commissioning Guides.
- Building Regulations - Approved Document A-O.
- CIBSE Guide A – Environmental design.
- CIBSE Guide B – Heating, ventilating, air conditioning and refrigeration.
- CIBSE Guide F – Energy Efficiency in Buildings.

- CIBSE Guide G – Public Health Services.
- CIBSE Guide H – Building Control Systems.
- CIBSE Guide K – Electricity in Buildings.
- CIBSE Guide L – Sustainability.
- BS 1710:2014 – Specification for identification of pipelines and services.
- BESA DW/143 – Ductwork Air Leakage Testing, Sixth Edition 2013.
- BESA DW/144 – Sheet metal ductwork, Third edition 2016.
- BESA DW/145 – Guide to good practice for the installation of fire and smoke dampers.
- BESA DW/172 – Specifications for Kitchen Ventilation systems.
- BESA TR19 – Guide to good practice for the internal cleanliness of ventilation ductwork.
- Existing Topographical & GPR Surveys.
- IET Wiring Regulations (BS 7671): Compliance with the Institution of Engineering and Technology's standards for electrical installations.
- British Standards (BS): Relevant UK standards for electrical, mechanical, and plumbing systems, including the latest editions of BS 7671 (Wiring Regulations), BS 5839 (Fire Alarm Systems), BS 9999 (Fire Safety), and BS EN 13779 (Ventilation).
- Radisson Brand Standards: Compliance with the operational, aesthetic, and technical specifications set forth by the Radisson Hotel Group to maintain brand consistency and quality across their hotel portfolio.
- CIBSE Guides: These include CIBSE Guide A (Environmental Design), CIBSE Guide B (HVAC Design), and CIBSE TM44 (Air Conditioning Inspections), which provide detailed guidance on best practices for the design of building services.
- BREEAM: The project is targeting a 'Good' rating under the BREEAM standard, aligning with sustainability goals and ensuring environmental performance meets the required benchmarks for energy efficiency, water use, and overall building impact.

These standards and regulations form the foundation for the design approach, ensuring that the building services contribute to the overall functionality, sustainability, and regulatory compliance of the project.

4. Mechanical Design

4.1 Heating, Ventilation, and Air Conditioning (HVAC)

Heating

The heating strategy for the Radisson RED Hotel has been carefully designed to provide efficient thermal comfort across all areas of the building while integrating sustainable and energy-efficient systems.

The primary heating provision will be provided by the Air Conditioning (AC) system, which will be utilised to maintain comfortable indoor temperatures throughout the hotel. The AC systems have been selected to ensure both cooling and heating capabilities, offering a flexible and efficient solution for the hotel's diverse operational requirements. The system will be capable of meeting the heating demands across the majority of the hotel, with careful consideration given to the specific needs of each space.

In certain areas where air conditioning is not required, such as circulation spaces and stores, local electrical panel heaters will be installed to provide supplementary heating. These heaters will be strategically positioned to compensate for heat loss in smaller or less frequently occupied areas, ensuring that temperature levels remain consistent and comfortable without over-heating the building.

For Domestic Hot Water (DHW) generation, the system will be served by 4No. Air Source Heat Pumps (ASHPs), which will be responsible for generating the heat required for the hotel's hot water supply. These heat pumps will operate efficiently, extracting thermal energy from the outside air to provide renewable, low-carbon heat to the building. The generated heat will be distributed via a circuit loop (CT Circuit) that will feed into 4No. 2000L Hot Water Indirect Calorifiers, where the thermal energy will be transferred to the water for the hotel's hot water supply.

The calorifiers will be sized to meet the expected peak demand for hot water, ensuring that the hotel can operate efficiently even during high occupancy periods. The indirect heat transfer method used within the calorifiers will provide an energy-efficient means of heating water, reducing the overall load on the mechanical system and enhancing the sustainability credentials of the project.

Ventilation

A comprehensive ventilation strategy has been developed for the Radisson RED Hotel, with systems tailored to suit the requirements of each area within the development.

A central Air Handling Unit (AHU) will be located on the plant mezzanine above the kitchen, providing mechanical supply and extract ventilation to the ground floor landlord and common areas. This unit has been selected to deliver optimal air quality and thermal comfort in these high-traffic zones, with appropriate filtration and heat recovery included to improve energy efficiency.

The basement level will be ventilated via a dedicated supply and extract fan system terminating at the existing lightwells, designed to operate in both normal and emergency modes. In the event of a

fire, the system will be activated to provide smoke clearance at a rate of 10 air changes per hour (ACH). Operation in this mode will be controlled via three-point motorised dampers, which will adjust airflow direction and volume based on system requirements. To ensure resilience and compliance with life safety systems, both fans will be connected to the Uninterruptible Power Supply (UPS), guaranteeing continuous operation during a power failure.

Each guest bedroom will be served by a local Mechanical Ventilation with Heat Recovery (MVHR) unit, located within the bathroom ceiling void. These units will deliver continuous background ventilation, providing both supply and extract air to ensure a comfortable and healthy indoor environment. The MVHR units will be integrated with the keycard system, ensuring that ventilation operates only when the room is occupied, thereby reducing unnecessary energy consumption.

Within the existing building, a sensitive approach has been taken to respect the fabric of the historic structure. Existing chimney stacks have been repurposed as ventilation risers, allowing for routing of fresh air intake and exhaust ducts to atmosphere. In the new-build extension, ventilation ductwork will terminate at the nearest external facade, except for the fourth floor, where terminations will occur through the roof at the facade edge.

Circulation spaces, housekeeping rooms, and similar ancillary areas will be ventilated via a heat recovery ventilation unit, designed to serve multiple spaces efficiently. This system will ensure appropriate air change rates, maintain acceptable indoor air quality, and recover heat where possible to support the project's energy efficiency targets.

Air Conditioning

Air conditioning will serve as the primary source of heating and cooling for the Radisson RED Hotel, providing comfort to guests and staff across all areas of the building. The system will utilise R-410A refrigerant, selected for its efficiency and compatibility with the chosen plant equipment.

In line with best practice and to align with the project's sustainability goals, the design has eliminated the need for refrigerant leak detection within the bedrooms, reducing complexity, cost, and ongoing maintenance.

All guest bedrooms will be served via concealed fan coil units, located within ceiling bulkheads in each room. These units have been carefully selected and sized to meet the heating and cooling demands of each space, while maintaining low noise levels to ensure guest comfort. The fan coils will operate in conjunction with the room keycard system, ensuring they only function when the room is occupied—improving energy efficiency and reducing unnecessary usage.

The basement and ground floor areas feature a variety of air conditioning solutions tailored to suit the diverse room types and functional requirements. These include:

Fan coil units for larger open-plan areas; Cassette units for spaces requiring a more discrete aesthetic; Wall-mounted units in smaller or more constrained spaces.

Each unit type has been selected to provide effective zonal control, maintain occupant comfort, and allow for efficient system operation across all areas of the hotel.

The comms room will be served by a dedicated split air conditioning system, allowing for precise environmental control and temperature stability, which is critical for the reliable operation of IT and network equipment. This system will be independent from the general hotel air conditioning, ensuring resilience and continuity of service even during broader system downtime or maintenance.

The Air Conditioning condensers will be positioned at roof level, strategically spaced to ensure optimal airflow and maintenance access. All units will be installed behind an acoustic plant screen to mitigate noise transmission, ensuring compliance with local noise regulations and minimizing any potential impact on the surrounding environment or building occupants.

4.2 Domestic Water Services

The Cold Water supply for the Radisson RED Hotel will be provided by reutilising the existing incoming water supply to the site. The water will enter the building via the basement, where it will be connected to a 16000L Cold Water Storage Tank, which has been sized to meet the maximum peak demand for the entire hotel in accordance with CIBSE. This tank will serve as the primary storage for the building's cold water supply, ensuring an adequate reserve for daily operations, even during high demand periods.

To ensure the reliable and efficient distribution of cold water throughout the hotel, a three-stage booster pump system will be employed. This system will ensure consistent water pressure across the building, providing reliable water flow to all areas, including guest bathrooms, kitchens, public facilities, and back-of-house spaces.

In terms of hot water distribution, as previously mentioned, 4No. 2000L Indirect Calorifiers will be used to heat and store hot water. These calorifiers will be integrated with the cold water storage and supply systems to ensure that both hot and cold water are delivered efficiently to all areas of the hotel, including bathrooms, kitchens, and laundry facilities.

The distribution of both hot and cold water will be managed via a series of risers, strategically placed throughout the building to ensure even and efficient delivery to all outlets. The system will be carefully designed to minimise any pressure losses, with appropriate sizing of pipework and components to ensure optimum performance.

Safety is a top priority in the design of the water systems. As such, key safety components, such as surge arrestors, will be incorporated into both the hot and cold water systems. These devices will help to protect the system from pressure surges, ensuring that water supply is delivered without the risk of damage to the pipework or fittings, and ensuring the longevity and safety of the entire system.

4.3 Sanitary Waste and Vent Systems

The above-ground drainage system for the Radisson RED Hotel has been meticulously designed to ensure efficient waste water removal while minimising pipe lengths and fittings. This approach not only optimises the performance of the system but also reduces the potential for maintenance issues and ensures compliance with relevant standards.

The waste water from the hotel's guest bedrooms will be directed to a local drainage riser, which will service multiple floors, with double-stacked bedrooms where possible. This design strategy ensures that the drainage system operates efficiently, reducing the need for multiple risers and simplifying the layout. By grouping the waste outlets in this way, we can minimise both the pipework and the space required, improving overall system performance and reducing the building's footprint.

For the kitchen, bar, and refuse areas, we are still awaiting final specifications. However, provisional allowances have been made to accommodate these key spaces, ensuring that the drainage system can be adjusted to meet the unique requirements of these high-demand areas once the final details are confirmed.

The design has been sized and configured in full compliance with British Standards (BS) and CIBSE Guides, ensuring that all aspects of the drainage system meet the necessary performance criteria, including loading units, waste disposal requirements, and system durability. Particular attention has been given to ensuring that the drainage is capable of handling the peak waste loads expected in the hotel's operational environment, including high guest occupancy periods and busy service times in the kitchen and bar areas.

4.4 BMS and Controls

The Building Management System (BMS) for the Radisson RED Hotel will be a key element in ensuring the efficient operation, monitoring, and control of all mechanical, electrical, and public health systems throughout the building. A dedicated BMS control panel will be installed in the Low Voltage (LV) switch room, acting as the central hub for managing the integration of critical plant and systems.

The BMS will interface with various plant and equipment, allowing for real-time monitoring and automated control, thus ensuring optimal performance and energy efficiency. The key systems that will be integrated into the BMS include:

- Air Handling Unit (AHU): The BMS will control the AHU to ensure efficient air exchange, monitoring air quality, temperature, and humidity levels across the hotel to maintain a comfortable and healthy indoor environment for guests and staff.
- Booster Set: The BMS will manage the operation of the booster pump set, ensuring that consistent water pressure is maintained throughout the building, adjusting pump speeds as required based on real-time demand.
- Domestic Hot Water (DHW) Pump: The BMS will regulate the DHW pump, ensuring that hot water is delivered efficiently to all outlets, maintaining a consistent supply while minimising energy consumption.
- Air Source Heat Pumps (ASHPs): The BMS will manage the operation of the 4No. Air Source Heat Pumps, optimising their performance to meet the hot water demands of the hotel, ensuring energy efficiency and reducing operational costs.
- Bedroom MVHR Systems: The BMS will also integrate with the Mechanical Ventilation with Heat Recovery (MVHR) systems in each guest room. These systems will operate based on the

occupancy of the room, controlled via the keycard system. When a guest enters the room and inserts the keycard, the MVHR system will be activated to provide fresh air ventilation while recovering heat from the exhaust air to pre-condition the incoming air. This system will improve energy efficiency and ensure a fresh and comfortable environment for guests, while also reducing heating or cooling demands.

In addition to the above, the BMS will monitor and control various other plant and system components, including lighting systems, heating and cooling systems, and emergency power systems. The integration of these systems within the BMS will allow for seamless operation, with real-time data to support efficient building management.

The BMS will offer remote access, enabling facility management teams to monitor system performance, identify issues, perform diagnostics, and optimise operations from a central location. This capability will improve the overall energy efficiency of the building, reduce maintenance costs, and help achieve the project's sustainability goals, supporting the BREEAM 'Good' rating and enhancing the operational longevity of the hotel's systems.

5. Electrical Design

5.1 LV Distribution

A dedicated HV/LV transformer will be required to supply power to the site. This transformer will feed a main LV panel, which will be located in the building's basement. From this main panel, power will be distributed to communal split-load lighting and power distribution boards, mechanical services supplies, dedicated kitchen distribution board, etc. A rising main busbar system will be installed, incorporating tap-offs at each floor to supply dedicated bedroom distribution boards. Each of these distribution boards will feed consumer units, with each consumer unit serving two bedrooms.

The final current rating of the main LV panel and associated infrastructure will be determined during the detailed design phase. Metering will be integrated at the main panel and connected to the BMS (Building Management System) for energy monitoring.

A minimum of 25% spare capacity will be provided within both the main panel and the associated distribution boards to allow for future expansion.

5.2 Small Power and Data

Indicative small power and data requirements across the scheme are currently shown on the Waldeck design drawings and are subject to further coordination and development. The final positions and quantities of small power and data outlets will be developed in collaboration with the client team and the interior design team to ensure alignment with the intended use of each space and the final architectural layout.

Provisions have been made to accommodate typical small power and data demands within bedrooms, communal areas, and back-of-house spaces. These will include appropriately rated outlets and structured cabling systems, with containment routes and outlet positions to be

confirmed as the interior design progresses and specialist requirements such confirmed kitchen equipment needs.

Allowance for flexibility and future adaptability will be built into the design, with consideration given to potential changes in furniture layout, equipment specification, and specialist integration. Final circuit loads and outlet quantities will be confirmed during the next stage of design development.

5.3 Fire Alarm System

A new addressable fire alarm system will be provided throughout the hotel, designed in accordance with BS 5839-1. The detailed design, including system category, device placement, void detection requirements and zoning strategy, will be developed in response to the project specific Fire Risk Assessment and in coordination with the appointed fire engineer and relevant stakeholders. The current Waldeck drawings give an indicative design of the new fire alarm system however this will require further development at the next stage of design development.

The system will provide full coverage to all guest bedrooms, circulation areas, back-of-house spaces, and plant rooms, with appropriate interfaces to other life safety systems such as smoke ventilation, lifts, access control, and the building management system (BMS), where required.

Cause-and-effect programming and alarm zoning will be defined following confirmation of the fire strategy documentation. All equipment selections and final layouts will be confirmed during the next stage of design development to ensure compliance with both regulatory requirements and operational needs of the hotel.

5.4 Security and Access Control

A comprehensive security and access control system will be developed for the hotel, with the final scope and layout to be confirmed through ongoing coordination with the client, and design team. The system design will be developed through the overall security strategy and operational requirements of the hotel.

Access control will be provided to restrict entry to back-of-house areas, staff zones, plant rooms, and other secure spaces, with proximity card or key fob readers integrated into the door hardware. Guest room access will be via a standalone electronic lock system, typically operated by RFID cards or mobile credentials, in line with the hotel's brand and operational preferences.

CCTV coverage will be provided throughout key areas including main entrances, lobbies, circulation zones, and back-of-house spaces, with recording and monitoring capabilities routed to a secure location within the building. The extent of camera coverage and recording retention periods will be developed further during detailed design and aligned with the client’s security requirements.

All systems will be designed to allow for future expansion and integration with the hotel's wider management systems where appropriate.

5.5 Lighting

A complete internal lighting and emergency lighting scheme will be developed for the hotel in accordance with relevant standards, including BS 5266-1 for emergency lighting and CIBSE lighting guidelines for comfort and efficiency. The lighting design will be coordinated with the interior design intent to provide a high-quality guest experience, while also addressing functional and operational requirements across front-of-house, back-of-house, and service areas.

Emergency lighting will be incorporated throughout the development to ensure safe egress in the event of power failure, with luminaires selected and positioned to comply with statutory escape route and standby lighting requirements. The system will comprise or self-contained conversion emergency luminaires.

Lighting controls, including presence detection and dimming capabilities, will be integrated in appropriate areas to enhance energy efficiency and user comfort. Scene-setting controls may be considered in selected public areas such as lobbies, restaurants, and conference spaces to support flexible use.

External lighting requirements will be reviewed and developed in line with the architectural design and operational needs of the hotel. The final extent and specification of external lighting will be subject to the outcome of discussions with the planning officer and any conditions set as part of the planning consent.

7. Sustainability and Energy Strategy

The sustainability and energy strategy for the Radisson RED Hotel has been developed to align with both regulatory requirements and the broader environmental aspirations of the client and design team. A key objective is to deliver a building that is energy-efficient, futureproof, and environmentally responsible, without compromising on performance or guest comfort.

As part of the low-carbon strategy, the project incorporates four Air Source Heat Pumps (ASHPs), which will serve as the primary renewable technology, providing low-carbon heating to the domestic hot water system via a closed-temperature (CT) circuit connected to indirect calorifiers. This approach significantly reduces reliance on fossil fuels and supports compliance with national carbon reduction targets.

All mechanical and electrical systems have been carefully selected to meet or exceed the requirements of Approved Document Part L (Conservation of Fuel and Power). Equipment has been assessed for energy performance and efficiency, ensuring that both individual components and the overall building services strategy contribute to reduced energy consumption and operational carbon emissions.

The project is being delivered in line with BREEAM sustainability assessment criteria, with a target rating of 'Good'. This will be achieved through a combination of passive and active measures,

including energy-efficient plant selection, water conservation strategies, responsible sourcing of materials, and enhanced indoor environmental quality.

In addition, the development aims to achieve an Energy Performance Certificate (EPC) rating of Class A, reflecting a high level of energy efficiency. This will not only support planning and building control compliance but also contribute to reduced operational costs for the building operator and improved asset value.

The sustainability strategy has been integrated across all design stages, and the project team will continue to monitor performance outputs and coordinate with energy consultants throughout RIBA Stage 4 to ensure that all proposed measures are implemented effectively.

8. Acoustics, Fire Strategy and Interfaces

The acoustic performance of the Radisson RED Hotel has been carefully considered as part of the overall design strategy to ensure that the building meets both regulatory requirements and the comfort of its occupants. An initial acoustic assessment has been carried out by a qualified acoustician to identify and address potential sources of noise disturbance. In response to this assessment, the design team proposes the installation of acoustically rated plant screens around all plant and mechanical equipment, ensuring that noise levels are kept within the parameters specified by the acoustician. This will help to mitigate noise transmission to surrounding areas, both within the building and to the external environment, and ensure compliance with local noise regulations.

The fire strategy for the project has been developed by Orion Fire Engineering, ensuring that the design fully complies with the necessary fire safety regulations and standards. The strategy outlines key fire protection measures, including the layout of escape routes, and the clarification of fire dampers within block A chimneys, which are now not required. Additionally, the fire strategy incorporates necessary changes to the building services to ensure fire protection is maintained across all systems, including smoke extraction, fire dampers.

The design team continues to work closely with the acoustician and fire engineer to address any emerging issues during the design process, ensuring that all aspects of the project meet the required performance standards and comply with the relevant regulations.

9. Coordination and Spatial Planning

A coordinated spatial planning approach has been undertaken to ensure that all mechanical, electrical, and public health (MEP) services are fully integrated into the architectural and structural design of the Radisson RED Hotel, while maintaining functionality, ease of access, and compliance with relevant standards.

Bathroom risers have been appropriately sized to accommodate soil and vent pipework, domestic hot and cold water services, and electrical consumer units, with space allowances included to facilitate installation and future maintenance access. These risers are distributed strategically

throughout the hotel to serve stacked room layouts efficiently and to minimise the horizontal distribution of services.

In addition to the local bathroom risers, the design incorporates several main service risers which form the core vertical distribution routes for the project. These infrastructure elements include pipework, ductwork, and electrical containment, and serve to distribute services from plant areas to each level of the building. Where possible, services have been grouped to reduce spatial requirements and improve coordination.

The ceiling voids across all floor levels have been carefully assessed to ensure they can accommodate the required services, including ductwork, cable trays, fan coil units, and ventilation terminals. Particular attention has been paid to areas with limited floor-to-floor height, where early-stage clash detection and coordination between disciplines has been critical to achieving a viable design.

The design team has worked collaboratively through regular coordination workshops and model reviews to ensure that adequate space has been allowed for all building services, while also addressing the architectural and structural constraints inherent to both the new-build and refurbished elements of the development.

10. Planning Submission Requirements

The following items have been produced to assist with the planning submission.

- MEP Strategy report
- Part L, EPC & BRUKL Report
- Ventilation Strategy Report
- Drawings Mechanically & Electrically for the project

11. Drawings and Appendices

Please refer to our Task Information Delivery Plan.