

**St. Michaels, Manchester
Commercial Development**

Project Title: St. Michaels, Manchester

Project Ref: 2986

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Report Ref: 01

VENTILATION SYSTEMS

System Objectives;

To provide complete, energy efficient, fully working and balanced ventilation system to the development that can:-

- Deliver sufficient outdoor fresh air to occupants;
- Deliver good indoor air quality;
- Ensure acceptable internal noise levels are not exceeded;
- Assist in the removal of heat gains;
- Remove odours, contaminants and moisture;
- Avoid cold draughts;
- Assist in avoidance of summertime overheating;
- Provide summertime night time cooling of the building fabric when required;
- Provide an easily controlled and maintainable system;
- To recover heat from the exhaust air stream for re-use in the fresh air supply.

The ventilation strategy, location of plant areas, proximity to external noise sources and selection of internal systems shall all be carefully considered from an acoustic perspective with particular attention to those areas which are very noise sensitive.

A mechanical ventilation strategy is proposed, whereby:-

PHASE 2

Offices

Air handling units shall be provided to supply tempered fresh air to the office spaces. They will utilise a variable air volume strategy, controlled to limit carbon dioxide levels on the floorplates. This approach will provide optimised air quality whilst minimising energy use. The AHUs shall be located in the designated roof plant area. The air handling units will be served by the air source heat pump LTHW and CHW circuits, to provide heating and cooling, the units will also incorporate all necessary filtration and attenuation. The units provide heat recovery in the form of a thermal wheel and shall generally comprise of the following sections:-

1. Air intake louver
2. Motorised shut off damper
3. Panel filters
4. Bag filter
5. thermal wheel (providing heat recovery)

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6. Supply fan
7. Return air fan
8. LTHW frost and heating coils
9. CHW cooling coils

The fans shall be inverter driven to provide variable speed control. Access panels shall be provided to allow access to all components.

Landlord and WC AHU

An air handling unit shall be provided to supply tempered fresh air to the landlord spaces and changing rooms and extract vitiated air from the WCs and Shower rooms. Make up air shall be provided naturally via undercut doors, door transfer grilles or transfer duct subject to the extent of air volumes required. The AHU shall be located in designated roof plant area. The air handling unit will be served by the air source heat pump LTHW circuits, to provide heating, the units will also incorporate all necessary filtration and attenuation. The units provide heat recovery in the form of a plate heat exchanger and shall generally comprise of the following sections:-

1. Air intake louver
2. Motorised shut off damper
3. Panel filters
4. Bag filter
5. Plate heat exchanger (providing heat recovery)
6. Supply fan
7. Return air fan
8. LTHW frost and heating coils

The fans shall be inverter driven to provide variable speed control. Access panels shall be provided to allow access to all components.

Basement AHU

An air handling unit shall be provided to supply tempered fresh air and remove vitiated air from the basement spaces. The AHU shall be located in the basement plant room. Intake air will be drawn from the landscaping and exhausted via façade louvers located at the ground floor. The air handling unit will be served by the air source heat pump LTHW circuit, to provide heating, the units will also incorporate all necessary filtration and attenuation. The units provide heat recovery in the form of a thermal wheel and shall generally comprise of the following sections:-

1. Air intake louver
2. Motorised shut off damper
3. Panel filters
4. Bag filter
5. thermal wheel (providing heat recovery)
6. Supply fan
7. Return air fan
8. LTHW frost and heating coils

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Basement carpark and general smoke extract and makeup air intake

Extract fans will be provided sized to provide adequate basement or carpark smoke extract, as well as general carpark extract in normal operation. In the event of smoke extract, the system will utilise motorised smoke and fire dampers to control zonal extract. An intake air fan will provide makeup air to the basement spaces in a smoke extract scenario. Carpark makeup air will be drawn passively via intake louvres in the landscape.

PHASE 3

5* Hotel Guest Rooms

Mechanical supply and extract ventilation within each hotel room shall be provided with continuous mechanical heat recovery systems designed to satisfy the background requirements of Building Regulations Part F. The MVHR (mechanical ventilation with heat recovery) units shall be mounted above the pod. Supply air shall be pre heated by the extract air via the integrated composite plastic counterflow heat recovery cell. This shall automatically vary the ventilation rate via EC/DC motors' as it receives signals from one of the interconnected sensors. When a signal is received the fans shall vary their speed proportionally or on a trickle and boost principle. The unit shall have the facility to commission the supply and extract fans individually via inbuilt minimum and maximum speed adjustments, or alternative wired remote control unit. The fans themselves shall have independent and variable speed control.

Residential Apartments

Mechanical supply and extract ventilation within the apartments shall be provided with continuous mechanical heat recovery systems designed to satisfy the background requirements of Building Regulations Part F. The units shall boost by means of the light switch operation within the pod bathroom and kitchen. In order to meet the requirement for purge ventilation, an MVHR boost facility will be provided together with reliance upon operation of the balcony doors (where provided). This pragmatic approach to compliance needs to be agreed with building control and it should be noted the boost facility also compromises the design acoustic criteria. All habitable spaces will be provided with mechanical temperature control in summer and winter, which will mitigate the need to operate the boost facility / open the balcony doors to control the temperature.

The MVHR units shall be mounted within the designated services cupboard and also in some ceiling voids/bulkheads.

The supply and extract configuration shall be generally as indicated on the drawings and as detailed in this specification. Supply air shall be pre heated by the extract air via the integrated composite plastic counterflow heat recovery cell. This shall automatically vary the ventilation rate via EC/DC motors' as it receives signals from one of the interconnected sensors. When a signal is received the fans shall vary their speed proportionally or on a trickle and boost principle.

General Areas

All other areas of the Block A tower shall be provided with mechanical supply and extract ventilation via air handling units located in dedicated plant zones, as identified below;

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AHUs shall be provided to the following areas;

1. Spa AHU
2. Gym AHU
3. Function North AHU
4. Function South AHU
5. Recording AHU
6. Ballroom AHU
7. Ballroom Kitchen AHU
8. Main Kitchen AHU
9. Restaurant AHU
10. Living Room AHU
11. North BoH AHU
12. South BoH AHU
13. Synagogue AHUs 1-5

Local Toilet Extract

Make up air shall be provided naturally via undercut doors, door transfer grilles or transfer ducts subject to the extent of air volumes required.

The local WC extract fans shall be complete with the following;

- time clock controller
- electronic fan speed controller
- an auto changeover facility
- duty/share facility which changes the lead fan every 12 hours
- AV mounts
- Back draught shutters
- Ductwork distribution system rising vertically through the building

Basement AHU

An air handling unit shall be provided to supply tempered fresh air and remove vitiated air from the basement spaces. The AHU shall be located in the basement plant room. Intake air will be drawn from the landscaping and exhausted via façade louvers located at the ground floor. The air handling unit will be served by the air source heat pump LTHW circuits, to provide heating, the units will also incorporate all necessary filtration and attenuation. The units provide heat recovery in the form of a thermal wheel and shall generally comprise of the following sections:-

1. Air intake louvre
2. Motorised shut off damper
3. Panel filters
4. Bag filter
5. thermal wheel (providing heat recovery)
6. Supply fan
7. Return air fan

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8. LTHW heating coils