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One Castlefield, Manchester

Planning Report | Ventilation Statement

Date: 15/07/2026
Ref: 3582-CWC-XX-XX-RP-N-7003



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Revision Record

Date	Reference	Revision	Prepared By	Checked By	Authorised By
29/06/2026	3582-CWC-XX-XX-RP-N-7003	P01	Ben Hawksworth	Ben Hawksworth	Ben Hawksworth
			Ben Hawksworth	Ben Hawksworth	Ben Hawksworth
15/07/2026	3582-CWC-XX-XX-RP-N-7003	P02	Ben Hawksworth	Ben Hawksworth	Ben Hawksworth
			Ben Hawksworth	Ben Hawksworth	Ben Hawksworth

Glossary of Key Terms

Abbreviation	Details	Abbreviation	Details
CIBSE	Chartered Institute of Building Services Engineers	Continuous operation	Uninterrupted running of a mechanical ventilation device, such as continuous mechanical extract ventilation or mechanical ventilation with heat recovery. The air flow rate provided by mechanical ventilation need not be constant but may be varied, under either manual or automatic control, in response to the demand for the removal of pollutants or water vapour
HVAC	Heating Ventilation and Air Conditioning	Ventilation	The supply and removal of air (by natural and/or mechanical means) to and from a space or spaces in a building. It normally comprises a combination of purpose-provided ventilation and infiltration
Whole dwelling ventilation (general ventilation)	Nominally continuous ventilation of rooms or spaces at a relatively low rate to dilute and remove pollutants and water vapour not removed by extract ventilation, purge ventilation or infiltration, as well as to supply outdoor air into the dwelling.	Dwelling	A self-contained unit designed to accommodate a single household
Background ventilator	A small ventilation opening designed to provide controllable whole dwelling ventilation	Extract ventilation	The removal of air directly from an internal space or spaces to the outside. Extract ventilation may be by natural means or by mechanical means (e.g. by an extract fan or a central system).
MVHR	Mechanical ventilation with heat recovery A mechanically driven ventilation system that both continuously supplies outdoor air to the inside of the dwelling and continuously extracts indoor air and discharges it to the outside.	Natural Ventilation	Ventilation provided by thermal, wind or diffusion effects through doors, windows or other intentional openings without the use of mechanically driven equipment. For the purposes of this approved document, natural ventilation refers to a ventilation strategy using background ventilators and intermittent extract ventilation

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1.0 Introduction

This report has been prepared to outline the proposed ventilation strategy for One Castlefield and to support the project planning application. The report aims to summarise the following key elements pertaining ventilation systems:

a) Areas of the building requiring ventilation
b) Proposed Ventilation systems design criteria
c) Proposed Ventilation strategies for each area of the building
d) Proposed Overheating Risk Mitigation strategies

The ventilation strategies outlined in this report will need to be developed as and when the scheme moves into the developed and detail design stages. To ensure optimum solutions are provided, the final designed solutions may differ from the outline proposals contained herein. However, the design criteria and basis for design will be maintained.

2.0 Project Background

The proposals for One Castlefield represent a refined residential development, addressing previous scheme shortcomings while maintaining a high-density residential offer. The site, located adjacent to the A57 Chester Road in Manchester city centre, is strategically positioned within the established Castlefield/St. George's area. It is well-connected, benefiting from proximity to Bridgewater Canal, mainline railway, tramway and Cornbrook Metrolink Station.

This development is the final phase of the St. George's regeneration. The design has evolved through rigorous pre-application engagement with the Manchester City Council, focusing on creating a high-quality, sustainable solution that responds positively to its local context, contributes to regeneration and aligns with current planning policy for tall buildings and the historic environment. Previous proposals were unviable due to regulatory changes (fire safety requirements for high-risk buildings necessitating an additional stair core) and design challenges related to site optimisation and amenity provision. The current design addresses these by consolidating blocks, increasing public and amenity space and strategically reorienting a taller tower to minimise impact on neighbours while creating a landmark. The scheme aims to be a positive visual marker and enhance the streetscape, capitalising on its gateway location and proximity to Cornbrook Metrolink Interchange to encourage sustainable transport.

3.0 Proposed Ventilation Strategy

The proposals around ventilation provision within the buildings is outlined below:

3.1 General Approach

The general approach to the building services strategy for each residential block is as follows:

- The design will adopt a low-energy approach, prioritising energy efficiency and reduced operational carbon through a fabric-first methodology. The building services will be based on an all-electric solution, with space heating provided via high-efficiency electric heating systems and domestic hot water generation through domestic air source heat pump technology.
- Systems will be selected to provide simple, robust and user-friendly solutions that are straightforward to operate and maintain, while incorporating appropriate innovation and delivering value for money throughout the building lifecycle.
- All building services installations will be designed to comply with current relevant legislation, Building Regulations, British Standards and industry guidance applicable to the development

3.2 Building Areas

The development includes the following key general spaces requiring ventilation:

- Residential Areas comprising of a mix of 1, 2, 3 and 4-bed units
- Residential ancillary areas including:
  - Residential lounge areas
  - Plant and equipment areas
  - Refuse Bin stores
  - Cycle stores
- Commercial Unit (Shell and Core)

3.3 Design Criteria and Compliance

The scheme will comply with the relevant statutory legislation and obligations as well as good practice where relevant. The following key elements will inform the ventilation services design:

- Building Regulations 2010 with the following Approved Documents (AD) employed:
  - Approved Document B (Fire Safety) volume 1: Dwellings, 2019 edition incorporating 2020 and 2022 amendments
  - Approved Document F (Ventilation) volume 1: Dwellings,
  - Approved Document F (Ventilation) volume 2: Buildings other than Dwellings,
  - Approved Document L (Conservation of fuel and power) volume 1: Dwellings, 2021 edition incorporating 2023 amendments
  - Approved Document K (Protection from falling, collision and impact)
  - Approved Document O (Overheating)
  - Approved Document Q (Security): Dwellings
- Other relevant documentation relied upon to develop the design will include:
  - The project Acoustic Consultant, Stantec and their report.
  - The project Air Quality Consultant, Stantec and their report.
  - The project Fire Engineering Consultant Alt Fire and their report.

The general design criteria for the ventilation systems for each general areas in the buildings are summarised below:

Residential Areas	Design Basis	Outline Indicative Design Criteria
Apartment/Townhouses	Ventilated in accordance with Part F (ADF) and Part O (ADO)	Part F requirements will be in accordance with section F(1). Part O requirements will be determined via the specific Part O calculations for the relevant example dwellings.
Residential corridors and stairwells	Ventilated in accordance with Part F (ADF) and Part O (ADO)	To meet TM59 and Part O
Plant and equipment areas	To suit plant and equipment	Mechanical ventilation due to basement plant area location
Refuse Bin stores	Ventilated in accordance with Part F and Part H (AD F & AD)H	Natural Ventilation plus Supplementary mechanical ventilation
Cycle Stores	Background ventilation	Natural Ventilation
Residential Lounge Area	Ventilated in accordance with Part F	Mechanical Ventilation

3.4 Air Quality

The assessment assumes that no air quality restrictions apply, with window operation available to support overheating control during occupied hours.

3.5 Noise Impact Assessment

The assessment assumes that no noise restrictions apply, with window operation available to support overheating control during occupied hours.

3.6 Overheating Assessment

The results of the overheating assessment indicate that all bedrooms and kitchen spaces in the One Castlefield residential development comply with the relevant overheating criteria.

Based on the inputs and assumptions detailed in this report, including the adopted ventilation strategy, glazing specifications, and internal gains, the simulated results demonstrate that all modelled spaces achieve compliance under the Approved Document Part O assessment methodology. This confirms that, with the proposed design inputs, the development has an acceptable risk of overheating during typical summer conditions.

3.7 Ventilation Concept Proposals

The buildings will be provided with ventilation systems in order to provide adequate supplies of fresh (outdoor) air for the comfort of occupants in accordance with the Building Regulations. Generally, the system shall have the following features:

- Provide sufficient fresh air supply and air extract to meet the requirements of Building Regulations part F.
- In conjunction with the heating systems, maintain internal temperatures as indicated within the design parameters to occupied areas of the building.
- Maintain fire compartmentation strategies as required by the Fire Strategy as set out in the Fire Engineers report.
- Coordinate with other systems and services within the building so as to allow easy access for maintenance and cleaning
- Be energy efficient and look to utilise appropriate, suitable low energy fans with low specific fan powers and controls.
- Meet the internal and external noise criteria as outlined by the Acoustic Consultant.

3.8 Residential Apartment and Townhouses

Each individual house and apartment will be provided with an individual ventilation system to meet the requirements of Building Regulations in particular AD F, AD L and AD O.

At present the design basis for the residential apartment and townhouses ventilation outline design proposals are as follows:

a) Mechanical ventilation with heat recovery (MVHR) to each individual house and apartment.
b) Opening windows to provide purge ventilation and as part of overheating risk limitation mitigation strategy.
c) Where windows are non-openable due to any external noise constraints overheating mitigation will be provided via the Mechanical Ventilation with Heat Recovery (MVHR) system, ensuring compliance with applicable indoor air quality and thermal comfort standards.

In accordance with the safety and security provisions set out in Approved Document O, the use of openable windows during nighttime hours is not recommended for ground floor bedrooms. To maintain compliance with thermal comfort criteria while ensuring occupant safety, overheating mitigation will be achieved through enhanced ventilation rates delivered via the Mechanical Ventilation with Heat Recovery (MVHR) system. This approach provides sufficient cooling without reliance on open windows, thereby aligning with both comfort and security requirements.

Local controls will be provided for the MVHR units, allowing user adjustment of operational modes in accordance with Building Regulations Part F requirements. Integral room and atmosphere attenuators will be incorporated to ensure compliance with internal and external noise criteria, maintaining occupant comfort and minimizing noise intrusion.

Air intake and exhaust terminals will be strategically located on external walls for the flats or roof terminals for the townhouses, designed to prevent recirculation and ingress of pollutants, and to comply with acoustic and weather protection requirements

The final design solution will be determined at the detailed design stages considering the principles set out in this document, Building Regulations, plant space as well as economic viability.

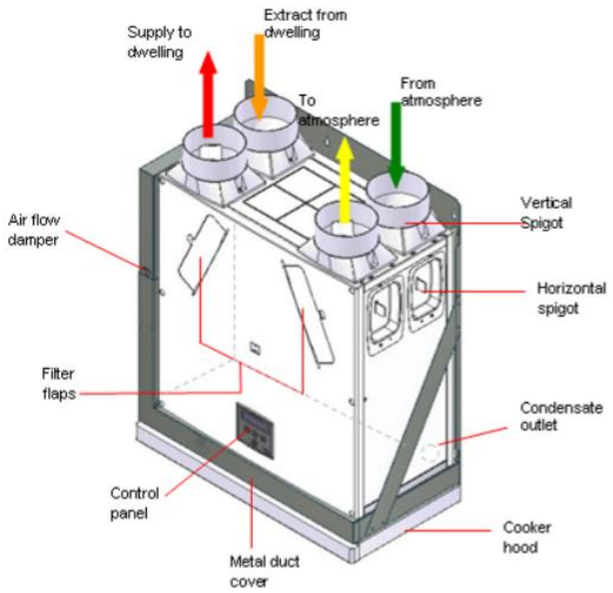


Figure 1: Typical MVHR Unit

3.9 Residential corridors and stairwells to apartment Blocks

Mechanical smoke ventilation system has been designed to provide both life safety smoke control to the residential corridors. The system comprises a mechanical smoke shaft serving the residential corridors, along with Automatic Opening Vents (AOVs) located at the head of each staircase. For day-to-day use, the AOVs and smoke shaft will operate via independent environmental controls such as local CO_2 or temperature sensors, or timed control units, to facilitate passive ventilation and maintain internal air quality. The system incorporates fail-safe override functionality to ensure that, in the event of a fire, it automatically switches to smoke ventilation mode in accordance with Approved Document B.

The smoke ventilation requirements for the project will be developed throughout the design process with the appointed Fire and Life Safety Consultant.

All proposals will be reviewed with the Fire and Life Safety Consultant and Building Control Officer as the design progresses

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3.10 Plant and equipment areas

The dedicated plant and equipment areas located at basement floor level will be provided with day-to-day ventilation via mechanical means ducted to ground floor louvres on the façade, with standby smoke extract fans to provide smoke ventilation to the basement areas.

3.11 Internal Refuse Bin stores

The internal refuse bin store areas located at ground floor level in both block of flats will be ventilated via a combination of natural and mechanical systems. Intake louvres on the façade will facilitate natural air flow, while dedicated mechanical extract ventilation fans will be provided. These systems will be equipped with timeclock and manual override controls. In addition, appropriate odour control measures will be incorporated as part of the mechanical ventilation design to ensure a hygienic and compliant environment.

3.12 Cycle stores

Cycling store areas will be provided with ventilation via natural means using louvres on the façade/security doors.

3.13 Amenity Lounge Areas

The amenity areas are to be ventilated with local MVHR units which are ducted to the external façade to meet the ventilation requirements of Approved Document F.

3.14 Ventilation Summary

A summary overview of the proposed ventilation strategies is provided below:

Residential Areas	Overview	System	Natural Ventilation Overheating risk Limitation	Purge Ventilation	Background Ventilation
Apartments / Townhouses	MVHR, Opening Windows (Natural Ventilation for purge and overheating requirements)	✓ MVHR	✓ MVHR + Opening Windows Where non openable windows enhanced ventilation rates delivered via the MVHR	✓ Opening Windows	n/a
Residential corridors and stairwells	Mechanical ventilation	✓ Via AOV and mechanical	✓ Via AOV and mechanical ventilation smoke	n/a	n/a

Residential Areas	Overview	System	Natural Ventilation Overheating risk Limitation	Purge Ventilation	Background Ventilation
		ventilation smoke shaft for block of flats	shaft for block of flats		
Plant and equipment areas	Mechanical Ventilation	n/a	n/a	n/a	n/a
Refuse Bin stores	Ventilation for odour control and gas build-up	✓ Supplementary mechanical extract	✓ Via façade louvres/security doors	n/a	✓
Cycle stores	Ventilation for odour control	n/a	✓	n/a	✓
Amenity Lounge Areas	Mechanical Ventilation	✓ MVHR	✓ MVHR	✓ Mechanical Ventilation	n/a

3.15 Ventilation terminals

Ventilation terminals will be sited in accordance with Building Regulations Part F and Part J and integrated into the façade design by the Architect.

The building does not propose to use any fossil fuels for general day to day use and therefore there will be no local flues from boiler plant etc.

3.16 Other Considerations

The project will take due consideration of other associated factors informing the design including ensuring window and door design and openings meets the wider requirements of Approved Document K (Protection from falling, collision and impact) and Approved Document Q (Security): Dwellings.

3.17 Conclusion

The mechanical design of the residential development will be design with particular emphasis on mitigating overheating and ensuring optimal air quality. For the apartment and townhouses, the design includes Mechanical Ventilation with Heat Recovery (MVHR) systems, complemented by opening windows for natural ventilation to address both purge and overheating needs. In instances where windows are non-openable, enhanced ventilation rates will be provided through the MVHR system to maintain indoor air quality. Residential corridors and stairwells are mechanically ventilated using Automatic Opening Vents (AOV) and a mechanical ventilation smoke shaft, in line with the fire engineer strategy. Plant and equipment areas are ventilated via mechanical ventilation via façade louvres. Refuse bin stores receive ventilation for odour control and gas build-up through supplementary mechanical extract, while cycle stores are ventilated to control odours via façade louvres or security doors. The amenity lounge areas will be ventilated via local MVHR units which will be connected to louvres within the building façade. This design approach ensures all areas meet stringent air quality, ventilation standards and overheating, maintaining the high standards of energy efficiency and comfort as required for the development.