

Manchester Metropolitan Library Transformation Project

Ventilation Statement

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Glossary

Term	Definition
AHU	Air handling unit
BREEAM	Building Research Establishment Environmental Assessment Method
CHW	Chilled water
FCU	Fan coil unit
GIA	Gross internal area
LTHW	Low temperature hot water
MCC	Manchester City Council
MMU	Manchester Metropolitan University
MVHR	Mechanical ventilation (with) heat recovery
PV	Photovoltaic
VAV	Variable air volume
WC	Water closet

1 Introduction

This document defines the basis of design and outline description of the ventilation systems for the Library Transformation Project at Manchester Metropolitan University, as required by the Manchester City Council Planning Authority.

1.1 Description of Development

The proposed overall quantum of development is set out within Table 1.1.

Table 1 Description of Development

	Proposed Parameters
Site area (inside red line)	C. 6,700 sq m
Use (Library)	21,800 sq m GIA
Use (Terrace)	900 sq m GEA
Height	63 m, ground + 12 storeys
Parking	No car or cycle parking directly associated to the site, utilising the existing Manchester Metropolitan University travel plan.

1.2 Site Description

The Site lies within the City Centre, and within the Regional Centre as defined by MCC's Core Strategy 2012. The Site boundary extends to c.0.7 hectares. The Site is bound to the east by Oxford Road, to the north by the Mancunian Way, Manchester Metropolitan University's Faculty of Business and Law to the west, and All Saints Park to the south.

The Site currently comprises the All Saints Library Building, a seven storey brick building, currently used as a library facility for students and staff of Manchester Metropolitan University, and comprising desk spaces, book clusters and meeting rooms. The Site is currently occupied, and it is intended that part of the site will remain in operation through the five year refurbishment and construction period.

The building's pedestrian access is currently from All Saints Park to the south of the building. There is no car parking associated to the library building.

The Site forms a key site along the Oxford Road Corridor, a priority location for higher education and an opportunity to strengthen and diversify the economy by creating high added value growth in sectors such as Creative and Digital, Health, Science and Innovation, and Advanced Materials and Engineering.

Low rise buildings are located to the east, on the opposite side of Oxford Road, which comprise of shops and commercial properties of approximately 2 to 3 storeys in height. To the south, All Saints Park provides public realm, surrounded by Manchester Metropolitan University Buildings, and St Augustine's Church.

To the west, there are further University buildings, and student accommodation. To the north, Mancunian Way runs east to west, and to the north of that, the Manchester Metropolitan University John R Dalton Building and Circle Square.

2 Basis of Ventilation Design

2.1 Overview

A good ventilation strategy is crucial to providing a high-quality indoor environment, whilst minimising energy consumption. A fully mechanical ventilation system is proposed delivering outdoor air to the back of fan coil units and/or chilled beams, which will deliver the air to the occupied zone while also providing space heating and cooling. Variable air volume (VAV) boxes will allow demand control ventilation; adjusting the rate of air supply according to demand by monitoring and responding to carbon dioxide levels within the space.

To ensure the quality of outside air drawn into the building, several factors have been considered, such as avoiding recirculation of exhaust air and the intake of contaminants. Extract discharges and air intakes will face different directions or be spaced to minimise cross-contamination and short-circuiting.

2.2 Design Criteria

The internal design parameters displayed in the table below have been used as a basis for ventilation system design. These parameters are based on Building Regulations Approved Document F, CIBSE guidance, and Manchester Metropolitan University design standard.

Table 2.1 Internal Design Criteria

Space Type	Upper limit for the indoor ambient noise level L _{Aeq,30mins} dB	Ventilation Rate
1:1 Spaces / Phone Booths / Pods	40	10l/s/person
Assistive Learning	30	10l/s/person
Book Sorting	40	10l/s/person
Café/Kitchen	50	10l/s/person
Collection Care	40	10l/s/person
Conservation Studio	40	10l/s/person
Consulting Space	35	10l/s/person
Cleaners Stores	50	3 ACH
Digitization Space / Gallery / Digital Studio	40	10l/s/person
Meeting Rooms	35	10l/s/person
Offices	40	10l/s/person
Open Plan Workspace	40	10l/s/person
Plantrooms / Comms Rooms	50	3 ACH
Prayer Room	30	10l/s/person
Reception/Entrance	45	10l/s/person
Stairs / Lobbies / General Circulation	45	10l/s/person
Teaching Rooms	35	10l/s/person
Toilets / Showers	45	5 ACH

3 Description of Ventilation Systems

This section describes the ventilation systems at the end of RIBA Stage 3. It may be necessary to adjust these systems as the design develops, while maintaining the requirements described in the previous section.

3.1.1 Open Plan Study Areas / Offices / Meeting Rooms

Ventilation will be provided by centralised air handling unit (AHU) plant. The new build tower and existing refurbishment will be serviced by two separate systems due to the phasing of the construction. In each case the plant will be located at roof level of the phase served.

The AHUs will include filters, thermal wheel for heat recovery, cooling coil and heating coil for tempering of fresh air supply. A bypass will be provided within the AHUs to cater for conditions where it is not preferential to recover the heat. Intake, discharge, supply and extract air will be provided with attenuators as required to meet the external ambient and room noise criteria.

AHU supply and extract air will be manifolded at plant level before being distributed throughout the building via vertical risers and high-level horizontal distribution. CO2 and temperature sensors located in the spaces will control a zonal variable air volume (VAV) damper within the spaces, modulating the supply and extract air rate to suit varying occupancy within the zone and shutting down the mechanical ventilation to save energy during periods of no or low occupancy. VAV boxes will be provided with attenuation to mitigate regenerated noise.

3.1.2 WCs

WC and shower areas will be provided with mechanical extract ventilation with make-up air via lobbies / corridors / adjacent rooms.

3.1.3 Ancillary areas

Corridors and circulation spaces will be ventilated by the circulation of air from surrounding spaces, resulting from general movement around the building.

3.1.4 Plant rooms

Plant rooms will be ventilated naturally by louvred openings where connectivity to the external environment is practicable. Local mechanical ventilation will be provided to prevent stagnation where natural ventilation cannot be achieved.

3.1.5 Firefighting Shafts

Each firefighting stair core has a shaft to provide a smoke-ventilated lobby on each floor. Smoke ventilation fans will be located on the roof and will have a secondary power supply.

4 Conclusion

The ventilation strategies described in this document will comply with Part F of the building regulations, and ensure that the air quality and occupant comfort within the buildings is satisfactory.

Any negative impact of ventilation systems on accommodation within the proposed development or neighbouring properties has been mitigated by:

- Avoiding exhausting onto neighbouring buildings or locations where people are likely to be present; by exhausting at roof level where possible.
- Installing noise attenuation equipment on ventilation plant to comply with the acoustic criteria.

This document describes the ventilation systems at the end of RIBA Stage 3. It may be necessary to adjust these systems as the design develops, while maintaining the intent to meet the basis of design described in the previous section.

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