

NOMA 2 & 3 Angel Square

Ventilation Statement

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Glossary

Term	Definition
AHU	Air handling unit
BCO	British Council for Offices
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
MEV	Mechanical extract ventilation
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 NOMA 2&3 Angel Square, as required by the Manchester City Council Planning Authority.

The application site comprises of Plots M and N of the NOMA Masterplan as defined in the NOMA Strategic Regeneration Framework Update 2020. The proposed development comprises the erection of two high quality commercial office buildings of 13 and 14 storeys, alongside public realm, car parking, extensive cycle parking facilities, and associated highways and access arrangements.

A breakdown of buildings' floor space is detailed below:

Table 1.1: NOMA 2 Angel Square

Level	Use	Area (GIA m ²)	Notes
Level 13/Roof	Plant area	288	
Level 12	Open office, meeting rooms, and terrace	1,447	GIA inc. toilets, building plant & building core
Level 11	Open office & meeting rooms	1,944	GIA inc. toilets, building plant & building core
Level 10	Open office & meeting rooms	1,900	GIA inc. toilets, building plant & building core
Level 09	Open office & meeting rooms	1,900	GIA inc. toilets, building plant & building core
Level 08	Open office & meeting rooms	1,900	GIA inc. toilets, building plant & building core
Level 07	Open office & meeting rooms	1,856	GIA inc. toilets, building plant & building core
Level 06	Open office & meeting rooms	1,856	GIA inc. toilets, building plant & building core
Level 05	Open office & meeting rooms	1,856	GIA inc. toilets, building plant & building core
Level 04	Open office & meeting rooms	1,900	GIA inc. toilets, building plant & building core
Level 03	Open office & meeting rooms	1,900	GIA inc. toilets, building plant & building core
Level 02	Open office & meeting rooms	1,900	GIA inc. toilets, building plant & building core
Level 01	Open office & meeting rooms	1,944	GIA inc. toilets, building plant & building core
Upper Ground	Open office & meeting rooms	1,408	GIA inc. toilets, building plant & building core
	Commercial units		
Lower Ground	Entrance	1,855	GIA inc. reception
	Carpark		
	Plant		
	Refuse		
	Changing & cycle store		GIA inc. toilets, showers, changing rooms
	Circulation		
Total		25,794	

Table 1.2: NOMA 3 Angel Square

Level	Use	Area (GIA m ²)	Notes
Level 12/Roof	Plant area	252	
Level 11	Open office & meeting rooms, and terrace	2,182	GIA inc. toilets, building plant & building core
Level 10	Open office & meeting rooms	2,414	GIA inc. toilets, building plant & building core
Level 09	Open office & meeting rooms	2,414	GIA inc. toilets, building plant & building core
Level 08	Open office & meeting rooms	2,414	GIA inc. toilets, building plant & building core
Level 07	Open office & meeting rooms	2,387	GIA inc. toilets, building plant & building core
Level 06	Open office & meeting rooms	2,387	GIA inc. toilets, building plant & building core
Level 05	Open office & meeting rooms	2,387	GIA inc. toilets, building plant & building core
Level 04	Open office & meeting rooms	2,414	GIA inc. toilets, building plant & building core
Level 03	Open office & meeting rooms	2,414	GIA inc. toilets, building plant & building core
Level 02	Open office & meeting rooms	2,414	GIA inc. toilets, building plant & building core
Level 01	Open office & meeting rooms	2,481	GIA inc. toilets, building plant & building core
Upper Ground	Open office & meeting rooms	1,769	GIA inc. toilets, building plant & building core
	Commercial units		
Lower Ground	Entrance	2,423	GIA inc. reception
	Carpark		
	Plant		
	Refuse		
	Changing & cycle store		GIA inc. toilets, showers, changing rooms
	Circulation		
Total		30,752	

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, 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 BCO and CIBSE guidance, and the MEPC design standard.

Table 2.1 Internal Design Criteria

Room type	Noise criteria (NR)	Ventilation rate	
		air changes / hour	litres/sec / person
Office Space (Open Plan)	<42		14
Retail Space	35-40		12
Internal Plant Room	<50 dBA		To suit plant requirements
External Plant Room	<50 dBA		To suit plant requirements
Reception/Lobby	<45		TBD
Circulation Space	<45		TBD
WCs / Changing / Showers	<45	6	
Restaurant	35-40		12
Gym	35-45		12
Kitchen (Commercial)	40-45		To BESA Guidance
Refuse Store		3	
Cycle Store		1	
Carpark		6 (ventilation) 12 (smoke)	

3 Description of Ventilation Systems

This section describes the ventilation systems at the end of RIBA Stage 2. It may be necessary to adjust these systems as the design develops, while maintaining the requirements described in the previous section.

3.1 2 Angel Square

3.1.1 Offices

Main offices (level 01 to level 12) will be served by floor-mounted air handling units (AHUs) installed within a plant room located on each level. Each plant room has louvres on the external façade for air intake and exhaust. Each office floor can be split into two tenancies, and VAV boxes will be used to shut off the air supply to a single tenancy if unoccupied.

3.1.2 Landlord-provided amenities

The office on the upper ground floor is likely to function as a business lounge operating outside standard office hours. This space will be ventilated individually using local MVHR units ducted to a louvre-band above the glazing.

The changing facilities on the lower ground floor will be ventilated using an MVHR unit ducted to louvres in the plant room on the upper ground floor.

3.1.3 WCs

WCs will be ventilated via MVHR units, with a single MVHR unit serving each group of WCs on each side of the core, on each floor of the building. The MVHR units will be ducted onto the façade of the plant room through louvres. The extract louvre is positioned to mitigate the risk of being drawn into other areas of the building and surrounding developments.

3.1.4 Ancillary areas

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

3.1.5 Commercial Units

Commercial units at ground floor are designed to a shell and core level of fitout and the ventilation system will be provided by the future tenant. A louvre-band has been provided above the glazing for the tenant ventilation systems. Where a retail unit is expected to have a commercial kitchen, a dedicated riser has been provided to allow a flue to be routed to the roof.

On the Level 12 office space, a louvre band has been provided above the glazing to allow future-flexibility for the office to be converted to a commercial unit; this will allow the tenant to install their own ventilation system.

3.1.6 Carpark

The car park will be provided with mechanical extract ventilation. Extract air will be ducted to the louvres on the plant room on the upper ground floor; make-up air for the extract will be provided naturally via supply air from the car park entrance doors and louvres.

3.1.7 Cycle store

The cycle store will be provided with mechanical extract ventilation. Extract air will be ducted to the louvres on the plant room on the upper ground floor; make-up air for the extract will be ducted from the louvres on the plant room on the upper ground floor.

3.1.8 Bin store

The bin stores will be provided with mechanical extract ventilation. Extract air will be ducted to the louvres on the plant room on the upper ground floor; make-up air for the extract will be transferred from the adjacent car park areas, or (if required by fire strategy) will be ducted from the plant room on the upper ground floor.

3.1.9 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.

3.1.10 Firefighting Shafts

Each 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.

3.2 3 Angel Square

3.2.1 Offices

Owing to a central core layout without direct connection to the external façade, upper floor office levels will be served by AHUs located on the roof. There are currently expected to be up to four tenancies per floor: splitting the floor plate into four, roughly equal quadrants; an AHU will serve each quadrant, giving each tenant access to a riser within their demise.

3.2.2 Landlord-provided amenities

The gym on the upper ground floor will be ventilated using a local MVHR unit ducted to a louvre band above the glazing in the façade.

The changing room on the lower ground floor will be ventilated using an MVHR unit ducted to louvres in the façade.

3.2.3 WCs

Two AHUs located on the roof will provide ventilation to WCs on all floors of the building, with one AHU located on either side of the core serving each group of WCs. The extract louvre is positioned to mitigate the risk of being drawn into other areas of the building and surrounding developments.

3.2.4 Ancillary areas

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

3.2.5 Commercial Units

Two commercial units each occupy two floors on the lower ground and upper ground floors facing Angel Square, and a third commercial unit (cinema/seminar) is on a single level (upper ground floor) on the Angel Gardens side of the building. All three commercial units will be designed to a shell and core level of fitout and the ventilation system will be provided by the future tenant. A louvre-band for the tenant ventilation systems has been provided above the glazing on the upper ground floor level.

3.2.6 Carpark areas

The car park will be provided with mechanical extract ventilation. Extract air will be ducted to the louvres on the plant room on the upper ground floor; make-up air for the extract will be provided naturally via supply air from the car park entrance doors and louvres.

Carpark exhaust fans will provide general ventilation and smoke extract and will therefore have a secondary power supply.

3.2.7 Cycle store

The cycle store will be provided with mechanical extract ventilation. Extract air will be ducted to the louvres on the plant room on the upper ground floor; make-up air for the extract will be ducted from the louvres on the plant room on the upper ground floor.

3.2.8 Bin store

The bin stores will be provided with mechanical extract ventilation. Extract air will be ducted to the louvres on the plant room on the upper ground floor; make-up air for the extract will be transferred from the adjacent car park areas, or (if required by fire strategy) will be ducted from the plant room on the upper ground floor.

3.2.9 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.

3.2.10 Firefighting Shafts

Each 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.
- Ensuring carbon filtration is used in kitchen exhaust systems to mitigate potential odours.

This document describes the ventilation systems at the end of RIBA Stage 2. 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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