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M1 Piccadilly, Manchester

Manchester

Ventilation Statement

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QA

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Contents

<u>Section 1 - Introduction</u>	4
<u>Section 2 - Ventilation Strategy</u>	5
<u>2.1 - Basis of Design</u>	5
<u>2.2 – Living Spaces</u>	5
<u>2.3 – Reception and Communal Areas</u>	6
<u>Section 3 – Conclusion</u>	7

Section 1 - Introduction

Futureserv Ltd have been appointed by M1 Piccadilly to produce a Ventilation Statement in support of a planning application for the construction of a new build private residential development at Store Street, Manchester.

The development shall consist of 54 apartments across 15 storeys, varying in size between 2 bedrooms. The development includes a cycle store and plant space at ground floor, and residential amenity space at first floor in the form of a residents' lounge and outdoor terrace.

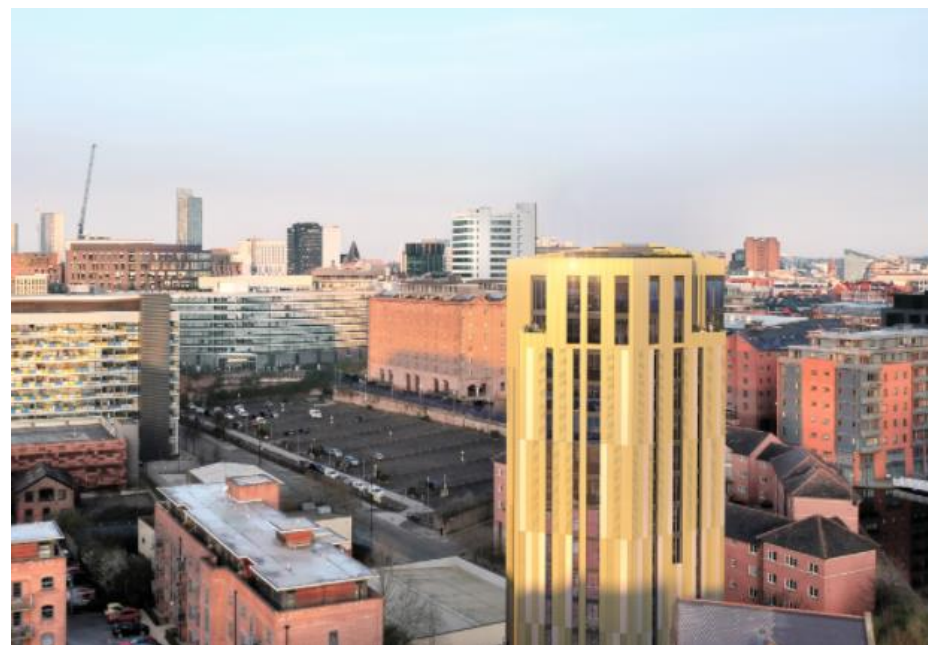
This Ventilation Statement has been prepared to illustrate the proposed ventilation designs. It addresses the building regulation requirements described within Approved Document Part F, 2010 for ventilation to the various facets of the proposed development.

The statement also highlights the need to provide complete, energy efficient, fully working and balanced ventilation systems 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 prevent cross infection (by full fresh air and negative pressure regime).
- To recover heat from the exhaust air stream for re-use in the fresh air supply.

Futureserv Consulting Engineers have collaborated with the design team in order to provide a holistic solution for the building that will provide an efficient envelope and contain intelligent building services reducing the environmental impact of the proposed development whilst providing comfortable living and working accommodation.

Proposed Development



Section 2 - Ventilation Strategy

2.1 - Basis of Design

The ventilation strategy has been designed to comply with the Building Regulations approved document Part F Means of Ventilation, 2010 with 2013 amendments.

This ventilation statement describes the basis of the design and outline scope of ventilation works for the various parts of the proposed development.

Table 5.1a Extract ventilation rates			
Room	Intermittent extract	Continuous extract	
	Minimum rate	Minimum high rate	Minimum low rate
Kitchen	30 l/s adjacent to hob; or 60 l/s elsewhere	13 l/s	Total extract rate should be at least the whole dwelling ventilation rate given in Table 5.1b
Utility room	30 l/s	8 l/s	
Bathroom	15 l/s	8 l/s	
Sanitary accommodation	6 l/s	6 l/s	

Table 5.1b Whole dwelling ventilation rates					
	Number of bedrooms in dwelling				
	1	2	3	4	5
Whole dwelling ventilation rate ^{a, b} (l/s)	13	17	21	25	29
Notes:					
a. In addition, the minimum ventilation rate should be not less than 0.3 l/s per m ² of internal floor area. (This includes all floors, e.g. for a two-storey building add the ground and first floor areas.)					
b. This is based on two occupants in the main bedroom and a single occupant in all other bedrooms. This should be used as the default value. If a greater level of occupancy is expected add 4 l/s per occupant.					

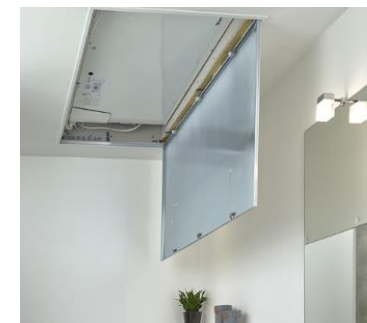
Abstract from Approved Document Part 'F'

2.2 - Apartments

The apartment ventilation systems will be designed to operate continuously at low speed air volumes created by energy efficient fans. This will allow the construction of a tightly sealed and correctly ventilated environment reducing thermal heat loss through reduced infiltration, whilst at the same time improving air quality and reducing the occurrence of moisture and mould.

To provide fresh air into the apartments each dwelling will be provided with a whole dwelling mechanical ventilation heat recovery (MVHR) system. This system comprises of a continuous mechanical supply and extract ventilation unit located within a service cupboard within each apartment.

The unit will be provided with a high level of heat recovery efficiency designed to aid part L compliance of the Building Regulations as detailed within the energy statement associated with this planning application. The air volumes will be determined to satisfy the requirements of the Approved Document Part F of the Building Regulations (see table opposite).



Wall Mounted and Ceiling Void Mounted Heat Recovery Units

The unit will be provided with a high level of heat recovery efficiency for example an integrated counterflow heat recovery cell designed to aid part L compliance of the Building Regulations as detailed within the energy statement associated with this planning application.

The air volumes will be determined to satisfy the requirements of the Approved Document Part F of the Building Regulations (see abstract from Approved Document Part F).

Each unit will intake fresh air and discharge exhaust air through the façade. The intake and exhaust louvres will be located a suitable distance apart to prevent cross contamination.

An intake supply filter inside the unit will be provided to remove incoming particulate and pollen matter.

The ventilation unit will remove air from the bathrooms and kitchens and provide air to the habitable rooms; namely the bed and living spaces, this will be via a rigid flat ductwork system with supply and extract air grilles located in the ceilings.

These systems shall operate day to day automatically and be controlled to vary ventilation rates via EC/DC motors' as they receive signals from one of the interconnected sensors and controllers such as a humidity sensor. When a signal is received the fans shall vary their speed proportionally or on a trickle and boost principle. The units may also be provided with manual control by means of switch control serving kitchens and ensembles.

The units 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, infinitely variable speed control.

The ventilation systems will be designed in rooms to meet the noise levels stated within available Acoustic design specifications. These figures will apply for all supply and extract systems.

Purge ventilation, giving the occupant final control over their environment, will be provided by minimum effective free area natural ventilation openings in the building facade. These openings shall only be used for purge and user overheating comfort and day to day ventilation shall be provided by the mechanical systems.

It should be noted that openable windows are purely for user comfort and shall satisfy the building regulations compliance for purge ventilation for odour control and to offset summertime overheating.

Window effective ventilation area openings shall be in line with the minimum requirements set out in Approved Document Part F of the Building Regulations including Appendix B.

2.3 – Landlord Areas/Communal Spaces

The developments ground and first floor consists of social space, concierge, landlord corridors and plant space.

The concierge and social area's will all require mechanical ventilation.

Local Heat Recovery units shall be provided to supply tempered fresh air to these spaces. The units shall be located locally within the ceiling voids at each floor level discharging to atmosphere via local louvres within the facade. The units shall be of the heat recovery type as per Mitsubishi Lossnay units or equal and approved. The units shall generally comprise of the following sections: -

- Return air fan
- Air intake louver
- Motorised shut off damper
- Fresh air filter (F7 Grade Filter)
- Extract filter (M5 Grade Filter)
- Counter flow heat exchanger (providing heat recovery)
- Supply fan
- Local controllers provided on each office floor plate.

- Common landlord corridors will all be naturally ventilated.

The systems shall be controlled to supply a constant air volume during occupied hours to meet minimum fresh air requirements and be provided with manufacturers controls package to ensure fresh air rates and temperatures are maintained at comfortable levels and allow connection to the central building management system.

Toilet, refuse and cleaners rooms will be ventilated by means of a fan extract systems with the fan units located locally to the space they are serving. 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
- Fan 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.

Section 3 – Conclusion

The ventilation strategy improves on the fundamental principles of the Building Regulations and will contribute to reducing the annual CO₂ emissions of the proposed development.

The proposed development will incorporate energy reduction measures in the ventilation systems to reduce the carbon footprint of the site using heat recovery devices and energy efficient fan selections.

Waste heat from the apartments will be recovered by the mechanical ventilation heat recovery (MVHR) systems. This type of ventilation will help to reduce heat demand and provide filtered air to the apartments thus promoting healthy living conditions for the occupants. All fans and motors shall be specified to incorporate ECA accredited technology and appropriate controls.