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Ventilation Strategy

Client

Forshaw Land & Property Group

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Project

Victoria House
Manchester



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INTRODUCTION

Project Address
Victoria House, Manchester

The project will comprise of a new build residential scheme for the Developer, Forshaw Land and Property Group Ltd. The high rise residential development of 177 residential units will comprise a mixture of one, two and three bedroom apartments.

The basement level will be a plant area. The ground floor will comprise a single commercial unit, concierge/management facilities, refuse store residents entrance area and gymnasium for the use of residents.

- Floor level 1 comprises apartments and cycle store.
- Floor level 2 comprises apartments and access to a terraced garden.
- Floor levels 3 to 23 comprise apartments.

This document has been commissioned to provide an overview of the ventilation strategies for the scheme and supports a planning application for residential development. This strategy is subject to further detailed design as the overall scheme is developed by the Architect and Design Team.

The following ventilation systems will be considered:

- Gymnasium Ventilation
- Plant areas Ventilation
- Common Areas and Meeting/Amenity Rooms Ventilation
- Apartment Ventilation

Smoke ventilation riser locations/sizes and automatic opening vents have been determined by the Fire Engineer and the Architect. This system shall be developed by the Architects and Fire Engineer.

2 GYMNASIUM VENTILATION STRATEGY

2.1 General Overview

The gymnasium shall occupy an area on the ground. Ventilation to the gymnasium shall be designed in accordance with CIBSE recommendations, HVCA standards and Building Regulations Approved Document F.

2.2 Gymnasium Ventilation

A supply and extract ventilation system, with heat recovery from extract air, shall be provided to the gymnasium. The system shall comprise ductwork systems and equipment located within ceiling voids with fresh air distribution and extract air louvres and grilles located within suspended ceiling grids.

Extract air rates shall be matched to supply air rates of 10l/person/second with supply and extract fans being housed integrally within the heat exchange equipment. The equipment shall include automatic summer bypass of the heat exchanger and have facility for condensate drainage. Presence sensors shall be used to control the ventilation equipment so use is restricted to hours of occupation.

Common Landlords areas shall be naturally ventilated where possible with supplementary ventilation provided via local mechanical fans as required.

Meeting rooms, concierge and facility management areas including the residents lounge shall either be naturally ventilated or mechanically provided with fresh air to meet a requirement of 10l/person/second.

Should there be a requirement for mechanically supplied fresh air, a supply/extract system shall be installed, with heat recovery, to give facility for tempering of the fresh air and improved room environmental conditions. The equipment shall include automatic summer bypass of the heat exchanger and have facility for condensate drainage. Presence sensors shall be used to control the ventilation equipment so use is restricted to hours of occupation.

Plantrooms will be either naturally ventilated or provided with mechanical ventilation.

Refuse chutes will be ventilated in accordance with the manufacturers recommendations. At planning stage the refuse chutes require 0.2m² of free area around the top and bottom of each chute.

4 APARTMENT VENTILATION STRATEGY

4.1 Introduction

A mechanical supply/extract system shall be provided to serve each apartment. The initial SAP calculations have indicated a requirement for MVHR (Mechanical Ventilation with Heat Recovery) to each residential unit.

4.2 Performance

An individual continuous mechanical extract/supply air ventilation system shall be provided within each apartment. Fresh air shall be introduced into each habitable space by means of a decentralised heat recovery MVHR (Mechanical Extract Ventilation System with heat recovery) unit within each apartment.

The following ventilation rates shall be provided as required under Approved Document F:

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 m² 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.

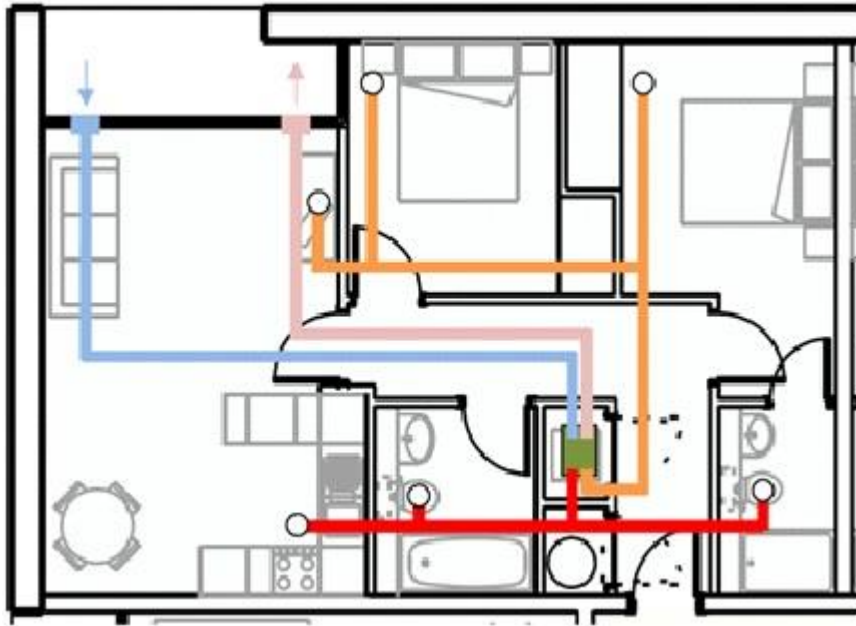
Extract from Approved Document Part F (2010)

The residential apartments will be provided with a continuous mechanical ventilation system with heat recovery (MVHR) as defined in Part F of the Building Regulations and have facility for boosted extract rates.

In boost mode the fan should additionally provide the extract rates:

- 13l/s in the kitchens
- 8l/s in the ensuites/bathrooms

A local “boost” switch shall be provided within the kitchen to permit additional extract as required. Boost within in the bathrooms and ensuites shall be achieved by the tenant operating the local lighting circuit.



Typical apartment MVHR system configuration

The fan unit shall be located at high level within the cylinder/laundry cupboard. The system shall draw in supply air from local perforated vent panels in the external facade and shall pass the air through a heat recovery section before discharging air into the bedrooms and lounge area. The system extracts warm air from the bathroom, ensuites and kitchen area and passes it through the heat recovery section before discharging to the external facade.

Internal supply and extract grilles shall typically be circular disc valve type.



Typical ceiling mounted Supply/Extract grilles

4.3 Additional Considerations

The ventilation design will need to take into consideration the acoustic recommendations both from external noise levels and prevailing winds. Reference shall be made to the acoustic report and the internal noise criteria for sleeping/resting. The ductwork would be securely connected and sealed to the external air grille/louvre. The junction between the ductwork and the external grille will need to ensure that the facade sound insulation performance is not adversely affected noting that the sound insulation performance is expected to be very high.

It should be noted that the supply and extract ductwork may require attenuation between the external facade grille and internal fan unit to prevent external noise being transferred through to the dwelling via breakout noise through the ductwork.

Should it be found that external air quality would adversely affect the internal conditions within the apartments suitable filtration units would be installed on the fresh air ductwork to provide acceptable conditions.

The SAP calculations have been based on high efficiency MVHR systems which have high heat recovery efficiency and low Specific Fan Powers (SFP's). Therefore the designer will need to ensure that the final selected product matches or exceeds the performance parameters within the SAP results. Openable ventilation grilles will provide facility for purge ventilation.

The ventilation system designer will consider the locations of compartment walls. Providing the ductwork does not have any internal strengthening ribs, PVC ductwork can generally be fitted with intumescent fire collars or duct wrap should it pass through fire compartments

External grille location should conform to the minimum recommended separation distances between the supply and extracts ducts in order to minimise the potential of short circuiting of supply and exhaust air. Domestic Ventilation guidance documents recommend a minimum separation of 300mm horizontally where ducts are terminated on the same facade although it would be recommended that the ducts are separated by at least 1 metre.

The Fire Engineering Specialist has identified that smoke extract ventilation is required to the apartment corridor areas. The solution would be in the form of a mechanical extract riser or a natural extract riser with automatic opening vent grilles/doors opening out into the compartment corridor. The smoke ventilation grilles would be controlled by a smoke/fire detection system installed to protect all areas other than apartments, which would have individual smoke/ fire detection systems installed.

The Architect and Fire Engineer have identified locations and sizes on their proposal drawings and will be submitting a suitable solution as part of a separate package of information.