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Moss Lane East, Manchester

Ventilation Statement

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QA

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Contents

Section 1 - Introduction.....	4
Section 2 – Ventilation strategy	4
2.1 - Basis of Design	5
2.2 – Student Residential Living Space	6
2.3 – Heat Recovery Ventilation	6
2.4 – Landlord Areas/Communal Spaces.....	8
Section 3 – Conclusion	10

Section 1 - Introduction

Futureserv Ltd have been appointed by CS Moss Lane East Ltd to produce a Ventilation Statement in support of a planning application for the re-development of a site at Moss Lane East, Manchester.

The development shall consist of the erection of a nine-storey purpose-built student accommodation building (plus basement and rooftop level) and associated landscaping, following demolition of nos. 470-472. This will include the conversion of and formation of internal link to nos. 466-468 to facilitate the conversion of the property to purpose-built student accommodation. Overall circa 261 units of purpose built student accommodation will be provided.

The new building will consist of plant space in the basement, amenity, and communal space at ground floor level, with space allocated for meeting and collaboration rooms, a gym and cinema, and nine-levels of living space complete with studio rooms, and clusters with shared kitchen space.

This ventilation statement has been prepared to illustrate the proposed ventilation designs. It addresses the building regulation requirements described within Approved Document Part F, 2021 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.

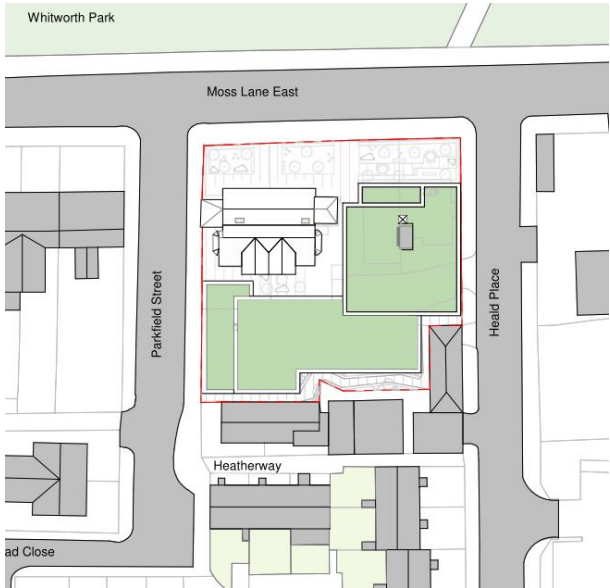
- To prevent cross infection (by full fresh air and negative pressure regime).
- To recover heat from the exhaust air stream for re-use in the fresh air supply.

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.

Existing Site Location & Layout



Proposed Site Layout



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, 2021 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 – Student Accommodation Living Space

The living space will include both studio apartments complete with kitchenette and 4, 6 & 8 person clusters, with shared living and kitchen space. Communal space will be located at ground floor level.

The existing listed building 466-468 Moss Lane East will be refurbished to provide studios at basement and first floor level.

Studio apartments will have a whole house ventilation system by means of a wall mounted or ceiling void mounted heat recovery unit. This will provide extract ventilation from kitchens and bathrooms and provide fresh air to habitable rooms. Intake and exhaust air will be via louvres in the external façade for the new build elements. Existing listed areas will require 2 No. air brick louvres per studio to allow for trickle vent/MVHR supply & extract duct connections to match existing air brick details.

Clusters will be of various sizes and will house up to two heat recovery units within the shared kitchen, rather wall mounted, or ceiling void mounted. The heat recovery unit(s) will provide supply and extract ventilation to the shared living area as well as each cluster bedroom and bathroom.

Purge ventilation, giving the occupant final control over their environment, will be provided via purge panels in the façade to the new build areas and a boost mode on the MVHR units. These openings shall only be used for purge and user overheating comfort and day to day ventilation shall be provided by the mechanical systems.

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

The initial air quality assessment for the site indicates no exceedances of the relevant air quality limit values and therefore considers natural ventilation as an appropriate ventilation strategy, therefore currently no requirement for NOx filtration on the air intake to the MVHR units.



Typical Facade Purge Panels

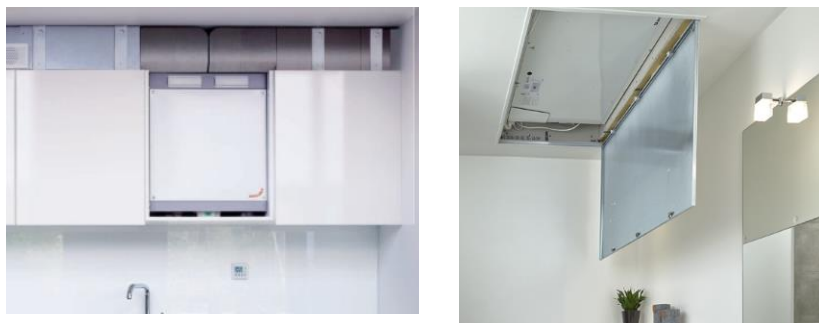
Communal corridors will have AOV openings installed for smoke extraction but will have an environmental mode which can be used for overheating relief which will be compete with temperature sensor in corridors. There are also 2nr dedicated smoke extraction risers at the end of each communal corridor rising up the building.

2.3 – Heat Recovery Ventilation

The studio and cluster 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 studios and bedrooms mechanical ventilation heat recovery (MVHR) system will be required. This system comprises of a continuous mechanical supply and extract ventilation unit located within the ceiling void of the cluster kitchen or studio. Alternatively cooker hood heat recovery units may be utilised.

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 section 2.1).



Wall Mounted and Ceiling Void Mounted Heat Recovery Units

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.

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 openable windows within the listed building and via purge panels within the new build areas. These openings shall only be used for purge and user overheating comfort and day to day ventilation shall be provided by the mechanical systems. Subject to further overheating assessment, the MVHR systems may be utilised to provide summer/purge boost mode which shall be operated locally via a manual switch within each studio/cluster bedroom.

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

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.

Following the recommendations of the project noise impact report, and Building Regulations Approved Document O, windows/purge panels will be openable during purge requirements (ie to remove odour/smell, or at user discretion), as acoustic conditions are not considered to be a concern during such a time. Where overheating mitigation is required, a higher number of air changes is required to achieve thermal comfort. During these instances, acoustic comfort remains a consideration. Following our initial modelling of scenarios to CIBSE

TM59, for compliance with ADO and the noise impact assessment we would recommend bedroom purge panels/windows could be open between 08.00 till 23.00 hrs, and cluster kitchen purge panels/windows could be open between 08.00 till 21.00 hrs without the need for any boost to the mechanical ventilation.

Attenuators will be installed to reduce external noise intrusion if required subject to the results of the acoustic survey.

2.4 – Landlord Areas/Communal Spaces

The development shall have multiple areas of landlord and communal space across the ground floor:

- Cinema
- Gym
- Meeting rooms & Collaboration space

Local Heat Recovery units shall be provided to supply tempered fresh air to these spaces. The units shall be located locally to each space within the ceiling voids, 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.



Heat Recovery Units

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.

Heat Recovery units shall be mounted within the ceiling void and these will be routed via rigid ductwork to supply and extract grilles located in the ceiling.

Intake and exhaust ductwork will be insulated to prevent condensation.

Louvres on the façade shall be required for connecting the ventilation ductwork intake and discharge points to outside.

Attenuators will be installed to reduce external noise intrusion if required subject to the results of the acoustic survey.

Toilet, refuse and cleaners rooms will be ventilated by means of a fan extract system 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 studios and clusters thus promoting healthy living conditions for the occupants. All fans and motors shall be specified to incorporate ECA accredited technology and appropriate controls.