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The University of Manchester

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Manchester Business School

Ventilation Strategy Statement

25 June 2013

...Making Buildings Work

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1.0 Introduction

1.1 Ventilation Strategy

Ventilation will be provided to the buildings in accordance with the 2010 Building Regulations, with reference to CIBSE Guidance. Ventilation is provided to maintain air quality and limit overheating in line with the requirements as stated above. All systems shall be complete with room-side and atmospheric-side attenuation as necessary to meet the defined noise limits as set out by the acoustic strategy for the site.

All mechanical supply and extract ventilation systems shall be provided with high efficiency heat recovery systems, except where stated otherwise.

Mechanical ventilation ductwork shall be constructed and installed in accordance with HVCA DW144.

The ductwork systems will incorporate all necessary extract grilles, extract valves and volume control dampers to allow efficient and accurate commissioning and balancing of the system. Fire dampers will be provided as required to maintain fire integrity.

The ventilation strategy for the each building, and relevant area, is detailed below:

1.2 MBS West

Ground Floor Meeting Rooms

The ground floor meeting rooms shall be provided with supply and extract ventilation by the use of local heat recovery ventilation units, designed and sized to suit the maximum occupancy to the spaces. Occupancy detection, through the University booking system and CO2 sensors within the space, shall control each system to ensure each ventilation system is operating only when necessary, including speed control to vary fan speed with occupancy. Fresh air intake shall be taken from the roof level via risers taken through the height of MBS West, with extract air locally to the Booth Street West elevation at ground floor.

Ground Floor Lecture Theatre 1

Ventilation plant shall be mounted on the roof position at fourth floor, ducting down through a new roof penetration and distributing at high level of the third floor to drop within the existing riser to the ground floor level. From here the plant will serve a system of high level supply and extract ductwork and grilles within the lecture hall, designed and sized to suit

the maximum occupancy to the space. The ventilation system shall be provided with occupancy detection via CO2 sensors to control ventilation rates for reduced occupancy. Fresh air intake and exhaust shall be located at the fourth floor roof level, to the elevations of the roof mounted plant compound, with separation to ensure the entrainment of exhaust with intake air is minimised.

Upper Floor Lecture Theatres 2 and 3

Ventilation plant shall be mounted within on-floor plantroom spaces located adjacent to the lecture theatres, ducting to the theatre and serving a system of high level extract and low level displacement supply diffusers, designed and sized to suit the maximum occupancy to the space. The ventilation system shall be provided with occupancy detection via CO2 sensors to control ventilation rates for reduced occupancy. Fresh air intake shall be located at the fourth floor roof level, with exhaust air taken to the local elevations to Booth Street West, with separation to ensure the entrainment of exhaust with intake air is minimised.

Second Floor Lecture Hall

Ventilation plant shall be mounted on the roof position of the MBS Tower above the tenth floor, ducting down through a new riser and serving a system of high level extract and low level displacement supply diffusers, designed and sized to suit the maximum occupancy to the space. The ventilation system shall be provided with occupancy detection via CO2 sensors to control ventilation rates for reduced occupancy. Fresh air intake and exhaust shall be located at the plant level, to the elevations of the roof mounted plant compound, with separation to ensure the entrainment of exhaust with intake air is minimised.

Ground Floor Restaurant and Café

Ventilation plant shall be mounted on the roof position at fourth floor, ducting down through a new riser position and serving a system of ceiling mounted supply diffusers and extract grilles, designed and sized to suit the maximum occupancy, heating and cooling demands to the space. Cooling shall be met where possible by the use of primary fresh air only, with active cooling provision only provided to limit upper temperature conditions where the external air temperature prohibits ‘free’ cooling by the air alone. Fresh air intake and exhaust shall be located at the fourth floor roof level, to the elevations of the roof mounted plant compound, with separation to ensure the entrainment of exhaust with intake air is minimised.

Ground Floor Kitchen

Ventilation plant shall be mounted on the roof position of the MBS Tower above the tenth floor, ducting down through a new riser to serve the kitchen. The extract requirements shall generally be met through a system of stainless steel extract canopies with integral baffle filters terminating over the working kitchen equipment, designed and installed to meet the requirements of the kitchen (to be defined) in line with HVCA DW/172. UV filtration, smoke precipitation and carbon filtration shall be considered within the extract ductwork system subject to the nature and extent of the cooking activities taking place. Supply ventilation shall be delivered to the space by ceiling mounted supply diffusers and/or canopy mounted supply systems. Due to the nature of the kitchen extract air and risk of cross-contamination with higher efficiency heat recovery methods, heat recovery shall be achieved by a run-around coil between the supply and the extract air. Fresh air intake shall be located at the fourth floor, to the elevations of the roof mounted plant compound.
Exhaust air shall be taken externally to the roof plant area to terminate away from natural ventilation openings and fresh air intakes.

Ground Floor Reception Area

The ground floor reception area shall generally be naturally ventilated, by the use of openings to the elevation. High level actuated openings linked to a dedicated natural ventilation control system shall control temperature and air quality within this space.

Cellular Office Spaces and Ancillary Accommodation

Cellular office spaces shall generally be naturally ventilated, by the use of openings to the elevation. Low level manual openings shall give local control to occupants, and high level actuated openings will provide an automated response to the internal environmental conditions, whilst also giving functionality for night-time cooling to those spaces where security allows. Spaces that are located internally, or are too deep plan to accommodate natural ventilation from opening windows shall be provided with mechanical supply and extract ventilation from a system of air handling units located on the fourth floor roof level within a plant compound. Fresh air intake and exhaust shall be located at the fourth floor roof level, to the elevations of the roof mounted plant compound, with separation to ensure the entrainment of exhaust with intake air is minimised.

1.3 Harold Hankins / Devonshire House

Learning Space

The learning space shall generally be naturally ventilated, by the use of openings to courtyards, fresh air intakes ducted from the roof level to low level, and high level natural exhaust openings. The natural ventilation shall be supplemented by a mechanical displacement ventilation system providing tempered air when the natural ventilation strategy will be unable to meet satisfactory conditions within the space (i.e. during cold or particularly warm external environmental conditions). Mechanical ventilation provision shall be concentrated around the high occupancy spaces of the space (PC Clusters etc.). Supplementary mechanical extract fans shall be provided at high level as necessary to additionally supplement the high level exhaust openings to increase the functionality of the natural / mixed mode system. The mechanical ventilation plant shall be located on the mezzanine level in the dedicated plant space, with fresh air intake drawn via risers from the roof level and mechanical exhaust taken to the plant space elevation. Natural ventilation openings to the Oxford Road elevation are deemed unfeasible due to noise and pollution issues. The natural ventilation system shall be controlled by a dedicated control system, with an interface to the main BMS to allow the natural and mechanical systems to work in conjunction appropriately.

Teaching Spaces

Teaching spaces shall generally be naturally ventilated, by the use of openings to the elevation or roof mounted ventilators where this allows. For those spaces ventilated from the external elevation, low level manual openings shall give local control to occupants, and high level actuated openings will provide an automated response to the internal environmental conditions, whilst also giving functionality for night-time cooling to those spaces where security allows. Spaces that are located internally, or are too deep plan or highly occupied to accommodate natural ventilation shall be provided with mechanical supply and extract ventilation from a system of air handling units. The mechanical ventilation plant shall be located on the mezzanine level in the dedicated plant space, with fresh air intake drawn via risers from the roof level and mechanical exhaust taken to the plant space elevation

Cellular Office Spaces and Ancillary Accommodation

Cellular office spaces shall generally be naturally ventilated, by the use of openings to the elevation. Low level manual openings shall give local control to occupants, and high level actuated openings will provide an automated response to the internal environmental conditions, whilst also giving functionality for night-time cooling to those spaces where

security allows. Spaces that are located internally, or are too deep plan to accommodate natural ventilation from opening windows shall be provided with mechanical supply and extract ventilation from a system of air handling units. The mechanical ventilation plant shall be located on the mezzanine level in the dedicated plant space, with fresh air intake drawn via risers from the roof level and mechanical exhaust taken to the plant space elevation

Lecture Theatres

Ventilation plant shall be mounted within the mezzanine plantroom space, ducting to the theatre and serving a system of high level extract and low level displacement supply diffusers, designed and sized to suit the maximum occupancy to the space. The ventilation system shall be provided with occupancy detection via CO2 sensors to control ventilation rates for reduced occupancy. Fresh air intake shall be located at the fifth floor roof level, with exhaust air taken to the local elevations within the plant area.

1.4 Retail Units

Ventilation plant shall be mounted within the mezzanine plantroom space within a defined space specific to the particular retail unit, ducting to the unit via a dedicated riser position. Access to install and maintain all ductwork within the mezzanine plantroom space and the risers shall be provided such that a tenant can carry out this work at a non-defined point in the future. Spatial provision is made for the eventual tenant to design and install their own systems. General space ventilation shall be provided with a louvre position at high level of the mezzanine level for the tenant to connect to outside air. For those retail units where catering provision is required, a separate riser (with access to the tenants) will be provided to allow the installation of ductwork to the fifth floor to terminate in an appropriate position to disperse the catering exhaust fumes.

1.5 Toilet Extract Ventilation

Mechanical extract ventilation will be provided as required within toilet areas, washrooms etc. all in compliance with 2010 Building Regulations and CIBSE Guidelines. Central toilet extract systems shall be provided with twin fan arrangements and auto changeover facility. Exhaust positions shall generally be local to the fan position, with exhaust located away from natural ventilation or fresh air intakes, to ensure that risk of entrainment is minimised.