

Space Studios – Phase 3

Ventilation Statement

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Glossary

Term	Definition
AHU	Air Handling Unit
BCO	British Council for Offices
CHW	Chilled Water
FCU	Fan Coil Unit
LTHW	Low Temperature Hot Water
MCC	Manchester City Council
MVHR	Mechanical Ventilation Heat Recovery
VAV	Variable Air Volume

1 Introduction

This ventilation strategy document has been produced in order to communicate the basis of design and outline description of the main ventilation systems for the new Phase 3 development at Space Studios, Manchester. This document has been produced as a requirement of the Manchester City Council Planning Authority.

1.1 Context

Buro Happold Engineering have been appointed by Manchester City Council to undertake design works for the proposed Phase 3 development located at the Space Studios site in West Gorton, Manchester. The development will consist of a 2no new TV production stages, supporting offices, workshops and ancillary areas.

1.2 Site Description

Space Studios is sited on a former industrial / manufacturing site in West Gorton. The site was acquired by Manchester City Council in 2012. The City's ambition to diversify and grow the creative sector within the region began the initial development works that is now Space Studios. MCC developed a masterplan to undertake a phased re-development of the initial 14 acres of land, formerly a redundant manufacturing facility for Fujitsu to create a purpose-built film and TV production facility for the North of England which would capture a larger share of the growing national market and build on Manchester's historic strength as a TV and Drama production centre.

The phased masterplan exploited the site's commercial potential and was specifically tailored to allow future phases to be developed in the context of the particular sensitivities of adjoining residents and businesses and to allow drama productions and other tenants to maintain continuity of their businesses during construction work.

The first phase of this re-development comprising part new-build elements and part renewal of existing building stock and provided:

- Five 12,000 sq. ft high-end TV production stages and associated support facilities
- 10,000 sq. ft of workshop space
- 40,000 sq. ft of production offices and support spaces such as dressing rooms, hair and make-up studios, green rooms etc
- Creative office space for companies providing services to the sector
- Events and communal space to encourage businesses to network
- On-site secure parking for productions and for unit base vehicles

The number of UK and international productions attracted to the first phase of Space Studios demonstrated that the facility provided the type, configuration and specification of space demanded by the sector. Since opening in late 2014 take up of spaces had been excellent and the site had hosted all the major national TV production companies with a high level of repeat business.

Building on this success MCC / MCDA undertook a second phase named 'Outer Space' and completed in late 2017. This was constructed on an adjacent 3.6-acre site, formerly a redundant mill and industrial complex acquired by the City to provide expansion space for Space Studios. This phase comprises:

- A 30,000 sq. ft sound stage with 10,000 sq. ft of bespoke support accommodation including production offices, dressing rooms, workshops etc.
- 50,000 sq. ft of adaptable workshop units for businesses who support the film and television industry
- Associated car and unit base parking and associated service access.

The remaining parcel of undeveloped land from the original Fujitsu plant sits at the south west corner of the site. The site is bounded by Phase 1 to the north, Kniveton Road to the west and Wenlock Way to the south and housed the former R&D block and tower building which were demolished in 2017. Following the demolition works a secure boundary was constructed and this plot formed a useful backlot / unit base location within the Space Studios secure site. This area of site will now make way for Space Studios Phase 3.

1.3 Description of Development

The new build elements principally consist of:

- Two 20,000 ft² new-build sound stages to produce high-end TV and film
- 30,000 ft² support Space across two floors, including workshops at ground floor level and offices on the upper floor
- External works including two-way vehicular movement outside new stages, Maximising car parking availability and landscaping

1.4 Ventilation Strategy Description

The proposed Phase 3 building has been designed to be a benchmark for high quality TV recording studios and support spaces for the Space Studios site. Therefore, close control of the building's internal environment is required. This is to ensure occupant comfort and secure Space as a desirable recording studio and office location. A fully mechanical ventilation system is proposed.

Each stage will be served by 2No. supply and extract Air Handling Unit's (AHU) located on the lower roof within the provided plant enclosure. From each AHU conditioned air shall be delivered to low level displacement diffusers within each of the stages, and exhausted from high level.

The first floor office spaces will be served by 2No. supply and extract Air Handling Unit's (AHU) located on the lower roof within the provided plant enclosure. From each AHU conditioned air shall be delivered to each office space, where there will be variable air volume (VAV) dampers prior to supply grille diffusers. Exhaust air return ducts shall also contain VAV dampers, in order to maintain balanced air distribution across each of the served areas.

Each AHU will consist of attenuation, pad pre filter, bag secondary filter, thermal wheel heat exchanger, integral DX unit for heating and cooling of supply air and a fan section.

The supply rate of fresh air will be demand controlled using feedback from temperature and carbon dioxide sensors distributed around the building. The ventilation systems to the stage of office areas will primarily be controlled on the basis of maintaining the desired temperature setpoints within each area. In addition, CO₂ control will also be present to ensure adequate rates of fresh air are delivered to each of the occupied zones.

Table 1—1 Building Uses by Level

Level	Use	Area (GIA m ²)	Notes
Roof	Roof Plant	937	GIA inc. lift plant and lobby
Level 01	Offices	1356	GIA inc. toilets, plant rooms and core
Ground Floor	Stages and Workshops	5471	GIA inc. toilets, plant rooms and core
Total		7764	

2 Basis of Ventilation Design

To ensure the quality of outside air drawn into the building, a number of factors such as recirculation of exhaust air or intake of contaminants have been considered. Extract discharges and air intakes will face different directions or be spaced adequately, where feasible, in order to minimise cross contamination and short-circuiting.

Generally, the building exhaust discharges will be located at high level or roof level. The filtration standards & specification of the air intakes will be appropriate to the type of functions served within the building. Fire dampers, smoke dampers and fire rated ductwork will be incorporated into ventilation systems as necessary to maintain fire compartments and satisfy fire safety requirements. Intake and exhaust to and from the AHUs will be attenuated to ensure noise breakout to atmosphere complies with the acoustic requirements.

It is proposed that the stage heating and cooling systems will be all-electric, comprising of a series of air source heat pumps (ASHP), serving direct expansion (DX) coils within the central air handling plant. The AHUs will provide fully conditioned air to both the stage and office areas, with recirculation dampers present for economiser control when CO2 levels within the occupied zones are not high.

In the office spaces, conditioning of the air supply from central air handling units will be through the use of integral heat pump DX units that utilise the refrigerant cycle to recover/reject heat efficiently from/into the exhaust air. As internal temperatures are controlled this results in a higher performance heat pump than one situated externally during peak summer and winter conditions.

Each WC block shall be provided with a twin extract fan, ducted to an local opening within the façade to minimise distribution distances and therefore fan energy consumption.

Natural ventilation shall be present in the ground floor workshop areas, as the large vehicle entrance doors shall be open regularly.

The internal design parameters are displayed in the table below. For each area of the building these have been used as a basis for ventilation system design. These figures are based upon BCO and CIBSE guidance. All naturally ventilated spaces will comply with CIBSE TM52 - Adaptive Comfort Criteria.

Table 2—1 Internal Design Criteria

Room Type	Design Temperature (°C)		Noise Criteria (NR)	Ventilation Rate	
	Winter Minimum	Summer		Air Changes / Hour	Litres / Sec / Person
Office Space	21-23	22-24	35	-	14
Stage	14-16	16-18	20	-	12
Plant Room	To suit plant	To suit plant	-	-	To suit plant
Workshop	Frost protection	N/A	-	NC	NC
Circulation Space	19-21	21-25	40	-	NC
WC's / Changing/ Showers	19-22	21-25	35-45	6	-

3 Description of Ventilation System

3.1 Stages

Conditioned air shall be supplied to each of the stages, via 2No. central air handling units located within the lower roof plant enclosure above the office spaces. From each AHU conditioned air shall be delivered to low level displacement diffusers within each of the stages, and exhausted from high level. This ventilation strategy is referred to as 'displacement ventilation' and is a highly efficient method large open areas such as the stages. This is due to the fact that the conditioned air is delivered directly to the occupied zone, with natural buoyancy driving the air up to high level, by means of the conditioned air passing over the local heat sources. As a result of this, the conditioned air can be delivered at very low velocities, meaning the fan energy consumption is heavily reduced, as is the operational noise level of the system.

The supply air volume and temperature shall be controlled to maintain the design setpoint temperatures within the occupied zones of the stages. CO2 sensing and control shall also be present, in order to maintain the minimum fresh air requirements based on the levels of occupancy.

Distribution lengths between the central plant and internal ventilation outlets have been minimised as part of the design process, by locating the plant arrangement centrally between the two stage areas.

3.2 Offices

The office areas shall be provided with conditioned air, via 2No. central air handling units located within the lower roof plant enclosure above the office spaces. From each AHU conditioned air shall be delivered to each office space, where there will be variable air volume (VAV) dampers prior to supply grille diffusers. Exhaust air return ducts shall also contain VAV dampers, in order to maintain balanced air distribution across each of the served areas.

The supply air volume and temperature shall be controlled to maintain the design setpoint temperatures within the occupied zones of the offices. CO2 sensing and control shall also be present, in order to maintain the minimum fresh air requirements based on the levels of occupancy.

The central air handling plant is located directly above the served office spaces, therefore minimising distribution lengths.

3.3 Workshops

As each of the workshops are provided with full height vehicle access door, which are going to be frequently open, adequate levels of natural ventilation will be present within these areas.

3.4 Toilets

The toilets will be ventilated by local twin extract fans, operating in a duty/standby arrangement. The location of exhausts are positioned to mitigate the risk of impacting surrounding developments by the exhaust air. The toilets will be provided with 6ACH in accordance with CIBSE guidelines.

3.5 Ancillary Areas

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

3.6 Tank Room

The tank room located at the rear of the ground floor workshop has an external wall and will therefore be provided with a fully louvred door, for natural ventilation provision. The space will be provided with electric frost protection as required.

4 Conclusion

The ventilation strategies described above have ensured Part F of the building regulations are met and 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:

- Ensuring all ventilation systems do not exhaust onto any neighbouring buildings or locations where people are likely to be present. This is typically by exhausting at roof level where possible.
- Installing noise attenuation equipment on ventilation plant in order to comply with the acoustic criteria.

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