



RIDGE

Ventilation Strategy Report
High Street, Uxbridge
26th March 2024

VENTILATION STRATEGY, HIGH STREET, UXBRIDGE

HIGH STREET, UXBRIDGE

26th March 2024

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1. INTRODUCTION

The purpose of this report is to provide a description of the Ventilation Strategy for the proposed re-development at High Street, Uxbridge to support the planning application for the development.

2. SITE DESCRIPTION

The site is located in Uxbridge at the junction of High Street, Belmont Road and Bakers Road and is an existing brownfield site with predominantly Retail and Office uses.

The existing buildings will be demolished as part of the project.



The site has all major services (gas, water, telecoms and electricity) within the surrounding roads which will need to be either isolated and either diverted or disconnected to develop the project.

3. THE PROPOSAL

The proposals comprise the demolition of the existing buildings and structures on the site to provide a mixed use development comprising hotel (Class C1), Co-Living (Class Sui Generis) and replacement commercial floorspace (Class E). The proposals include landscape improvements including the provision of a pocket park, car and cycle parking and associate infrastructure.

For further information on the proposed scheme, please refer to the Design and Access Statement prepared by CGL and Planning Statement, prepared by Savills.

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4. VENTILATION COMPLIANCE

All ventilation systems shall comply with the requirements of:

- Approved Documents F & B
- CIBSE Guides
- Relevant British Standards
- DEFRA Guidance Document “Guidance on the Control of odour and Noise for Commercial Exhaust Systems”
- Fire Strategy Report
- Acoustic Consultants Report

A further dictating approach in the design of the ventilation system is the criteria for overheating with adoption of CIBSE TM59 for the Amenity spaces and SAP calculations for the Co Living building.

Overall the ventilation strategy shall support the overall “well-being” and safety of the occupants and enhance the environment of the spaces, support low energy and carbon solutions.

When deemed appropriate the design shall attract relevant credits for BREEAM and promote good practice ventilation strategies throughout the development.

5. DEVELOPMENT AREAS / DEMISES

The development can be split into principle Areas/Demises being:

- Co Living
- Hotel & Retail

These areas and demises can also be split down into different functions being:

- **Co Living**
 - Habitable rooms – living rooms/kitchens/bathrooms
 - Communal spaces – corridors/lobbies/staircases
 - Plant & equipment spaces
 - Bike Store, storage, back of house and refuse
- **Hotel & Retail**
 - Retail space
 - Communal spaces – corridors/lobbies/staircases/toilet facilities
 - Reception
 - Bedrooms
 - Back of house facilities
 - Bicycle store & changing facilities
 - Refuse store

All these different types of spaces require specific ventilation strategies to meet the requirement for the health and wellbeing of the occupants and functionality of the spaces to meet the requirements and criteria set out in section 4 of this report.

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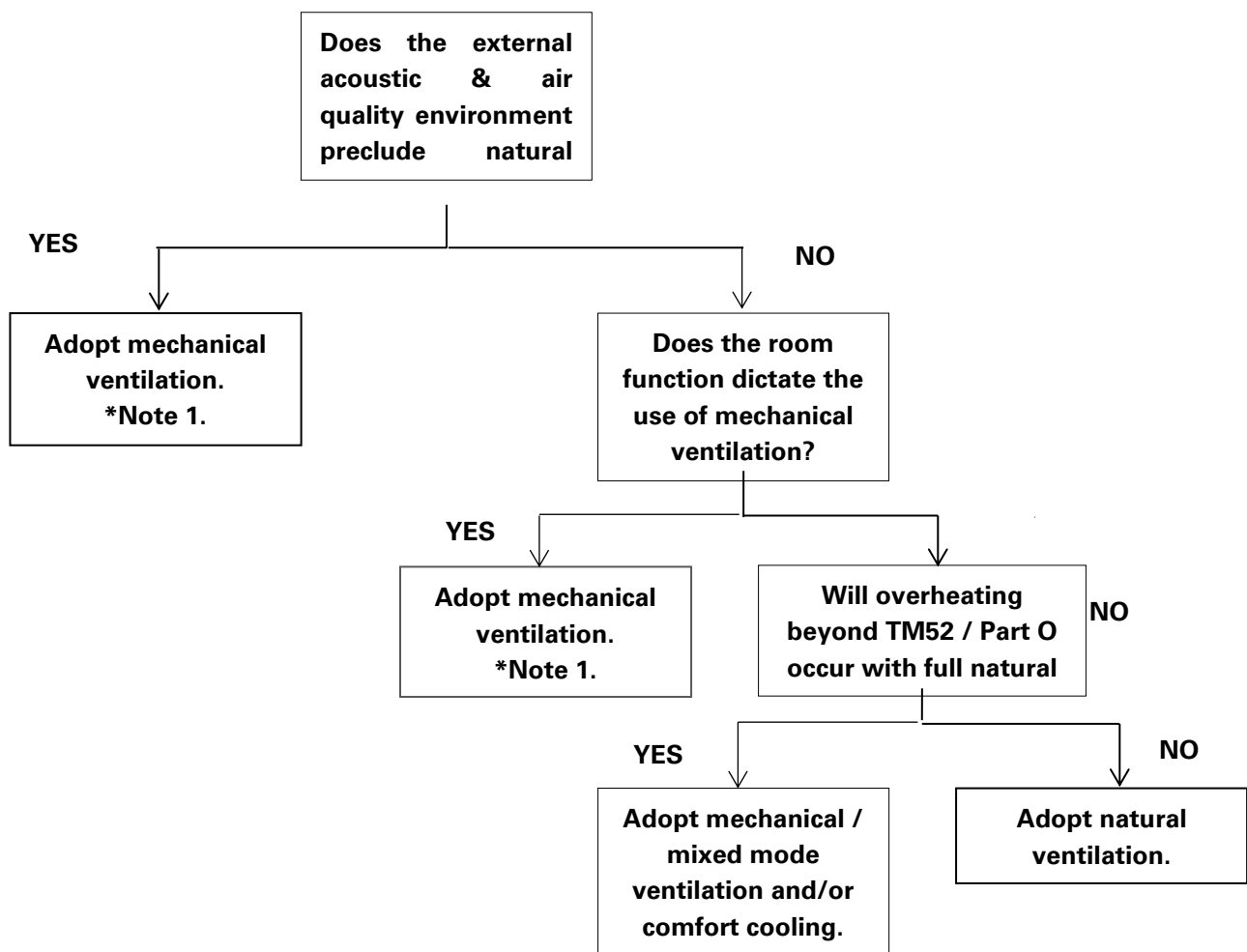
6. VENTILATION STRATEGIC DESIGN APPROACH

Whilst the principal function of the ventilation strategy is to provide sufficient fresh air and to exhaust odours, the correct ventilation strategy is crucial to minimise the energy consumed by the building – mechanical ventilation is a significant contributor of the building's electrical energy and therefore a strategy with natural ventilation is preferred.

However, mechanical ventilation is needed to the spaces that have high internal heat gains, in addition to reducing or negating external noise from traffic or other sources in accordance with the acoustic report.

The design methodology taken to establish the ventilation type has followed a strategic route:

STRATEGIC DESIGN APPROACH



***Note 1: Utilise comfort cooling where overheating occurs and/or appropriate mechanical ventilation Systems**

7. VENTILATION PROPOSALS

7.1. Co Living Apartments

The residential apartments shall be predominantly naturally ventilated through the opening panels in the façade and acoustic trickle vents within the windows. However, there are restrictions within the Acoustic report on the frequency that that panels can be opened. As a result, for the purposes of the Part O assessment, the residential apartments shall be considered as “predominantly mechanically ventilated”.

For the opening panels to be effective, an adequate amount of free area is required to be provided. The extent of glazing and the specification must be considered to reduce unwanted solar gain, thus reducing the risk of overheating.

Although natural ventilation will be adopted as the primary method of ventilation, the living / kitchen spaces and bedrooms will be mechanically ventilated via a mechanical extract ventilation system (MEV) to achieve Part O compliance.

Each apartment will have a MEV system located within the ceiling void, with the ductwork in the void between the ceiling and the underside of the slab. Fresh air intake and exhaust louvres will be contained within the demise of each apartment but designed to mitigate cross contamination.

Bathroom and kitchen areas will be mechanically ventilated via the MEV to comply with Part F of the Building Regulations.

An initial Part O assessment will be carried out on a typical floor in accordance with the Approved Document Part O requirement to use the guidance contained within CIBSE TM59:2017 ‘Design methodology for the assessment of overheating risk in homes’, as per section 2.3.

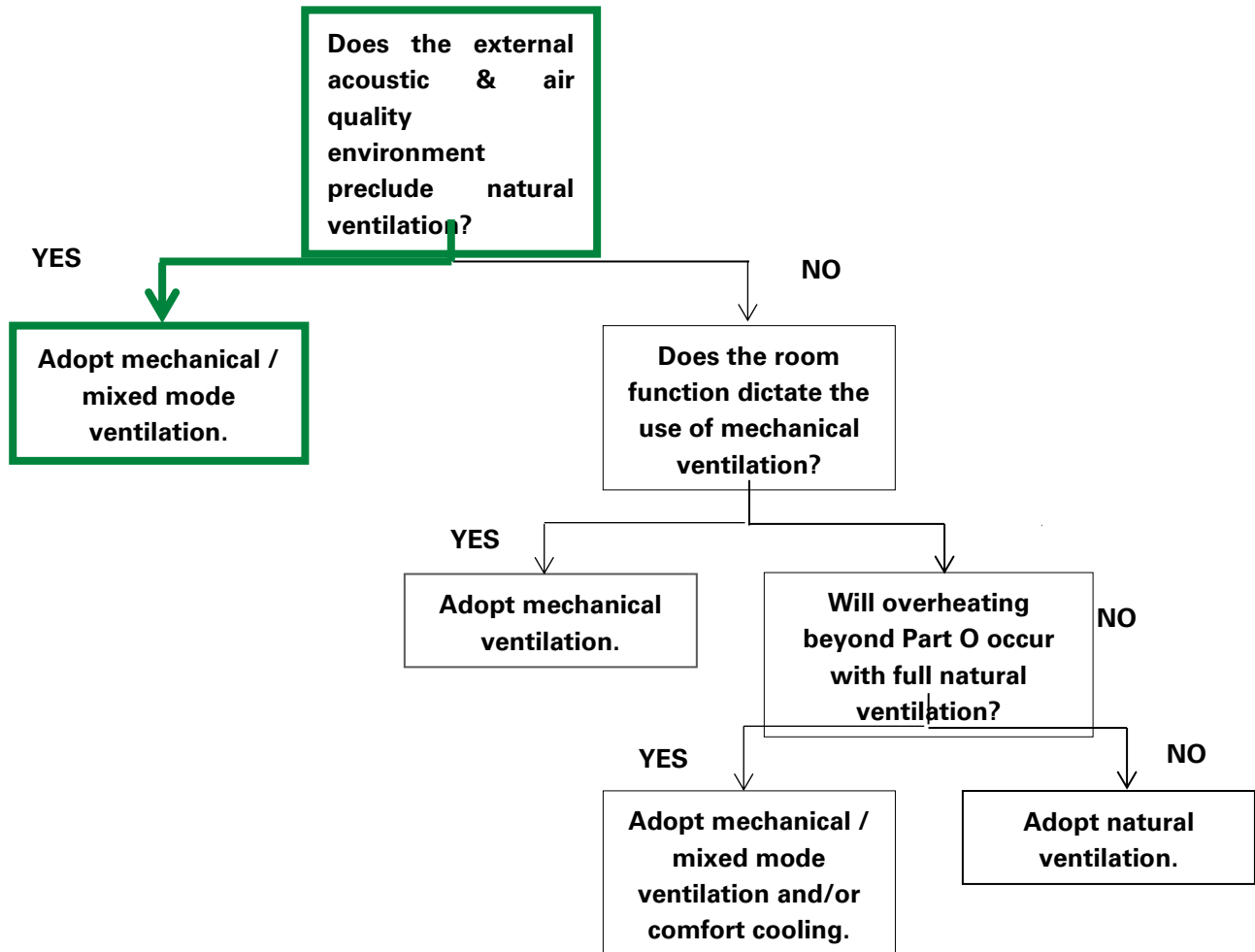
Due to the opening panels having restrictions on when the panels can be open as stated in the Acoustic Report, the spaces have been assessed under Section 4.3 of CIBSE TM59:2017, which requires the following criteria to be met:

4.3 Criteria for homes predominantly mechanically ventilated

For homes with restricted window openings, the CIBSE fixed temperature test must be followed, i.e., all occupied rooms should not exceed an operative temperature of 26 °C for more than 3% of the annual occupied annual hours (CIBSE Guide A (2015a)).

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STRATEGIC DESIGN APPROACH – RESIDENTIAL AREAS

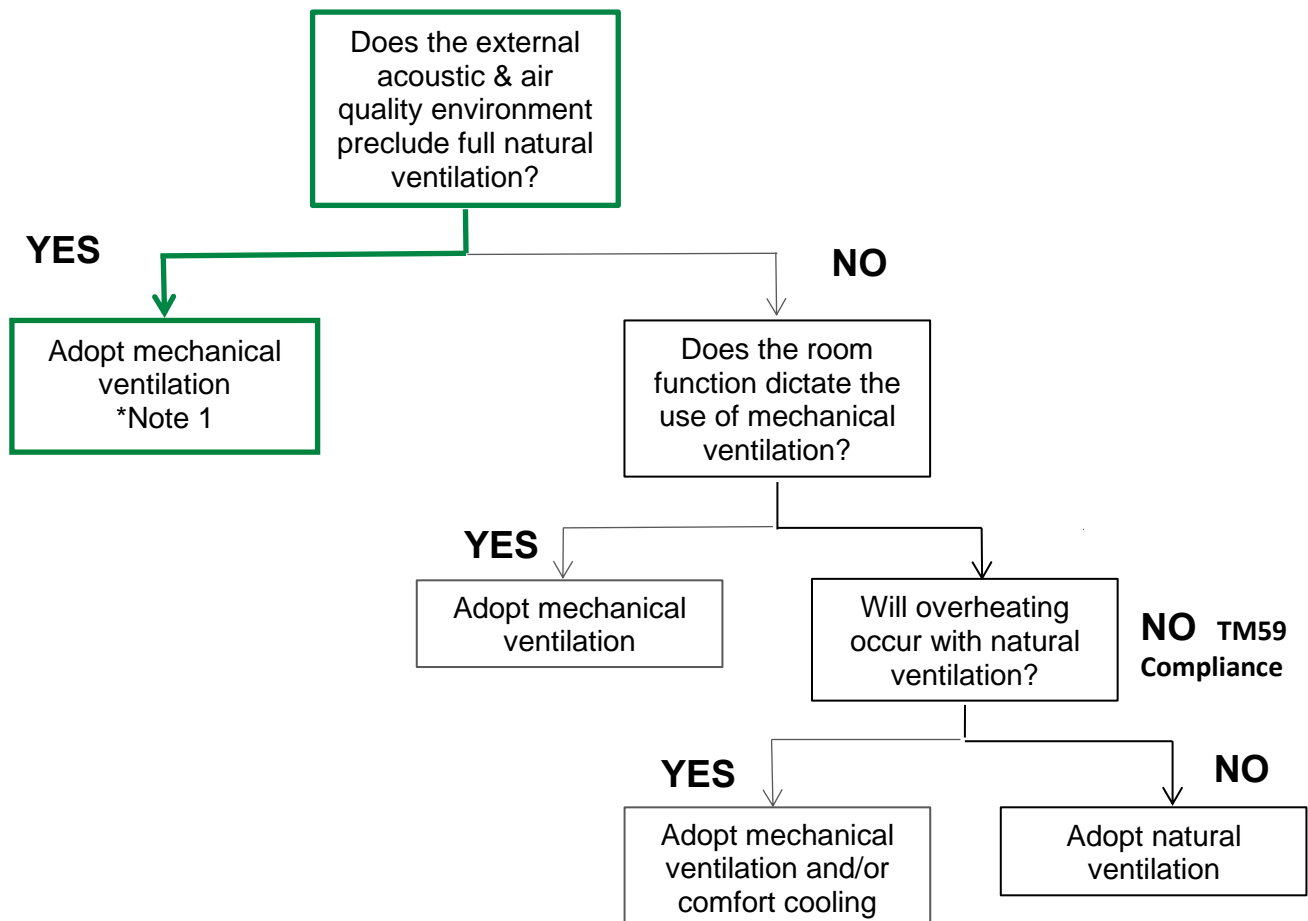


***Note 1: Utilise comfort cooling where overheating occurs and/or appropriate mechanical ventilation**

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7.2. Residential Amenity Space

STRATEGIC DESIGN APPROACH FOR RESIDENTIAL AMENITY SPACES



***Note 1: Utilise comfort cooling where overheating occurs and/or appropriate mechanical ventilation systems**

These types of spaces invariably experience high peaks of occupants and subsequent heat gains and fresh air requirements. On that basis natural ventilation alone cannot accommodate these 'spikes' in heat gains and CO₂ levels. Therefore, mechanical ventilation is proposed in the form of local Mechanical extract ventilation heat recovery systems (MVHR).

These systems shall be located in the ceiling level of each amenity space within the fresh air and exhaust provided locally in the form of louvres. Heating and cooling will be provided the form of reverse cycle heat pumps with indoor cooling and heating units located in the ceiling and of each room and heat rejection condensers on the roof.

The plant, storage and back of house areas will be provided with extract ventilation to meet the requirements of Part F.

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7.3. Smoke Ventilation

A smoke ventilation system shall be provided in accordance with the Fire Consultants report;

Draft BS 9991 recommends that evacuation lift lobbies should be protected akin to a stair with regards to smoke ventilation. However, there is limited guidance as to how this could be achieved. It is proposed that the following should be allowed for at present:

- A mechanical smoke shaft to provide inlet air into the lobby.

- Inlet air to supply at 10% of the corridor extract duty. Actual requirements to be developed during detailed design. The above allowance provides flexibility in design.

Each of the common corridors in the upper floors are to be provided with a mechanical smoke ventilation system. This should comprise of:

- An extract smoke shaft that achieves an equivalent performance, or better performance) to a 1.5m² cross sectional natural smoke shaft as defined in BS 9991. At present, 5m³/s extract duty at each smoke shaft vent should be allowed for.

- A mechanical inlet shaft near the stair to provide supply to prevent the corridor being over-pressured when all doors in the corridor are closed. The Fire Engineers propose that 60% to 70% of the extract duty is allowed for in the supply.

- Pressure sensors should be allowed for from a costing perspective. This may be required to help alleviate an over pressurised condition when all doors in the corridor are closed. Actual extract or supply duty required will be subject to smoke ventilation system design or coordination.

For further information, please refer to the Fire Engineers report.

7.4. Commercial / Retail Units

The retail units are a shell and core development with a future client fit out.

The retail units will be mechanically ventilated through ceiling void mounted Mechanical Ventilation with Heat Recovery Units with the intake and exhaust louvres through the façade.

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7.5. Hotel Bedrooms

Central mechanical ventilation air handling plant will be located at roof level in a plant enclosure with mechanical ductwork dropping vertically within the central core risers. From the risers horizontal ductwork will serve each floor with supply and extract ventilation for the defined occupancy levels.

The air handling plant at roof level will draw fresh air a minimum 10 meters from sources of pollution such as extract points (BREEAM Compliance).

The public toilets will be ventilated by a dedicated toilet system with run and standby motors on the extract fan system.

All ventilation systems to the office will be in accordance with the BCO Guide for Offices.

The plant, storage and back of house areas will be provided with extract ventilation to meet the requirements of Part F.

8. SUMMARY OF STRATEGIES

A strategic approach has been adopted to ascertain the most appropriate ventilation strategy for each building and type of space. This has taken account of environmental factors, energy efficiency and risk of overheating and the outcomes are summarised in the table below.

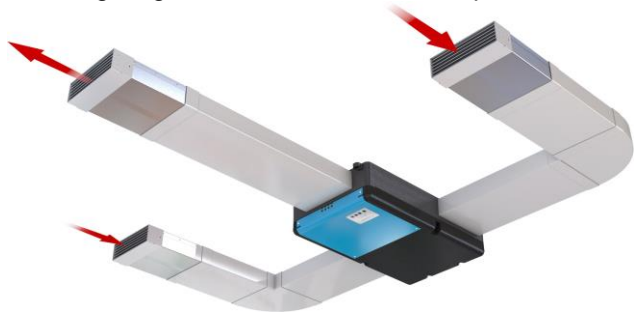
AREA	PART F (GENERAL)	OVERHEATING PURGE
Co Living	MEV per apartment extract to wet areas (Bathroom & Kitchen)	Supply air via acoustic trickle vents and Openable panels
Hotel bedrooms	Supply & Extract ventilation to bedroom with VRF for heating & cooling	Comfort cooling (VRV with ceiling concealed fan coil units)
Amenity Spaces (occupied)	MVHR (Local) to each demise	Comfort cooling (VRV with ceiling concealed fan coil units)
Plant Areas	To Part F (General natural vent louvre)	Assisted mechanical
Retail / Commercial	Mechanical ventilation with heat recovery	Comfort Cooling (VRV exposed fan coils)

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8.1. Co Living Mechanical Ventilation with Heat Recovery

Each apartment shall be provided with a mechanical extract ventilation (MEV) system and supply air via acoustic trickle vents to maintain fresh air quality. The air volumes shall be determined to satisfy the requirements of the Approved Document Part F of the Building Regulations. The units will be provided with a boost facility to satisfy the Part O overheating criteria.

The MEV units shall be in the ceiling void of each apartment. Each unit shall draw extract air from the living and bathrooms areas and discharge extract through each apartment façade. The exhaust louver shall be located to prevent cross contamination with the acoustic trickle vents located within the windows.



The ventilation unit will remove air from the wet rooms including the kitchen and create a permanent air path, through the property, from the dry habitable rooms; the bedrooms and the living room, connected through a system of rigid flat ducts. The air grilles shall be in the ceiling. The ventilation systems shall be designed in rooms to meet the NR level stated elsewhere within this report.

The ventilation system shall also be designed with a boost facility to meet the part F requirements.

8.2. Commercial Mechanical Ventilation with Heat Recovery

Commercial and Amenity spaces will be provided with mechanical ventilation heat recovery (MVHR). This shall comprise of a centralised continuous mechanical supply and extract ventilation unit, able to operate in 100% summer bypass with a high heat recovery efficiency (minimum 80%). The air volumes shall be determined to satisfy the requirements of the Approved Document Part F of the Building Regulations and CIBSE Guides.



The MVHR units shall be in the ceiling void. Each unit shall draw fresh air and discharge extract through the façade. The intake and exhaust louvers shall be separated to prevent cross contamination with a filter inside the unit near the heat exchanger to remove pollen and particulate matter.

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8.3. Local Extract

Local extract will be installed in spaces such as cycle stores, bin stores, stores and other ancillary areas.

The extract fans will be installed in the ceiling void and will have the option to operate on a temperature sensor or an occupancy sensor (PIR).

The mechanical extract installed within the bin stores will operate continuously.

The exhaust louvres will be coordinated to minimise cross contamination with intake louvres for other areas.



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