Conversion of an education building to residential apartment

Queensmere House,
49 Queen's Road,
East Grinstead,
West Sussex,
RH19 1BF

AVO (ACOUSTIC, VENTILATION & OVERHEATING) STRATEGY REPORT

for

RH19 Estates Ltd

June 2025

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1.0 Introduction

1.1 This report is submitted in support of the planning application DM/25/0388 relating to environmental noise, ventilation, and overheating. It summarise the integrated AVO strategy developed for the proposed redevelopment of Queensmere House, this strategy has been informed by:

- Noise Impact Assessment (Hawkins Environmental, 4 November 2024)
- Overheting Assessment (CIBSE TM59 / Part O) (zed, 20 April 2025)

1.2 The strategy confirms that:

- Good Acoustic Design (GAD) has been applied.
- Alternative design options have been reviewed and discounted where infeasible.
- MVHR systems have been selected to meeting internal noise, ventilation, and thermal comfort standards.

1.3 The proposal involves the conversion and refurbishment of an existing former office/education building to create residential units. As such, the design team is working within the constraints of an established built form, including retained structural walls, window positions, and overall orientation. These factors necessarily limit the extent to which passive measures — such as reconfigured openings, cross-ventilation paths or building massing — can be employed to address noise or thermal performance.

2.0 Acoustic Environment & Constraints.

2.1 The site is located adjacent to Queens Road and subject to elevated environmental noise. The acoustic reports finds:

- External Noise levels exceed BS8233:2014 and WHO NNGL threshold for open-window compliance.
- Internal bedroom levels with windows open at night exceed the WHO limit of 42 dB LAFmax.
- To achieve compliance, bedroom windows must remain closed overnight.
- Good Acoustic Desing principles were followed, but even with enhances façade insulation, compliance cannot be met with open windows.

3.0 Ventilation Strategy

3.1 Given the need to keep windows closed, alternative ventilation solutions were assessed:

- Natural Ventilation: Rejected due to acoustic and security constraints.
- Passive Colling Strategies (E.g. cross ventilation): explored but not sufficient to meet overheating limits.
- MVHR Systems (Mechanical Ventilation with Heat Recovery): Selected for ability to maintain internal noise standards while meeting ventilation needs.

3.2 The MVHR system

- Provides background and boost ventilation (Approved Document Part F)
- Includes summer bypass for cooling.
- Operates quietly targeting ≤30 dB LAeq in bedrooms.

3.3. Advantages of MVHR

- Ensures continuous fresh air supply without reliance on opening windows – critical in a noisy urban setting.
- Maintains excellent indoor air quality year-round.
- Reduces energy loss typically associated with natural ventilation – helping lower running costs and improve building energy efficiency.
- Avoids condensation and mould risk by controlling internal humidity.
- Is suitable for tight building layouts and retrofits, making it an ideal solution for this constrained conversion scheme.

4.0 Overheating Assessment (CIBSE TM59 & Part O)

4.1 Dynamic thermal modelling was conducted using IES VE and CIBSE DSY1 (2020 high50) weather data. Key findings:

- All units fail TM59 Criterion (a) and (b) under natural ventilation scenarios.
- This is due to:
  - Acoustic Requirements mandating closed windows at night.
  - Window restriction heights (due to safety / falls from height).

4.2 The report concludes that mechanical systems are required to prevent overheating.

5.0 Summary of Alternatives Considered

5.1 . All relevant alternatives were reviewed:

- Passive Design Strategies (Larger openings, orientation, fabric): insufficient alone.
- Acoustic ventilators / attenuated openings: not viable in this case.
- Secure nighttime ventilation: unfeasible due to external noise exceeding acceptable levels.

5.2 It should be noted that the development is a conversion of an existing structure, and opportunities to optimise the building envelope for natural ventilation of acoustic performance are inherently limited. For example, window positions and open sizes and places are constrained by the retained façade and structural configuration, meaning opens such as cross ventilation or relocated window openings were not practicable. As a result, the design must priorities retrofit compatible solutions such as MVHR which offer high performance within fixed architectural constraints

5.3 Therefore, MVHR is the only viable strategy that can meet all regulator and design criteria concurrently.

6.0 Compliance Summary

6.1

Requirement	Strategy	Compliant (Y/N)
BS8233:2014 & WHO NNGL – Windows Open	Not achievable due to noise	N
BS8233:2014 & WHO NNGL – Windows Closed + MVHR	Achieved using MVHR	Y
Approved Doc F Ventilation	MVHR meets performance and airflow rates	Y
CIBSE TM59 / Approved Doc O Overheating	MVHR mitigates risk where natural ventilation fails	Y
Good Acoustic Design (ProPG)	Fully integrated	Y

7.0 Demonstration of MVHR Compliance with Internal Noise & Ventilation Requirements.

7.1 The Environmental Protection Officer has requested that if mechanical ventilation is used, it must comply with internal noise and airflow standards. This will be achieved and verified through Building Regulations compliance as follows:

7.2 Ventilation Rates (Approved Document F)

- MVHR systems will meet:
  - Background ventilation requirements.
  - Purge ventilation (e.g. ≥4 ACH) for thermal comfort.
- Performance to be demonstrated through on-site commissioning and airflow testing.

7.3 Internal Noise from MVHR (BS8233)

- All systems will be designed to ensure:
  - Bedrooms: ≤30 dB LAeq,8hr
  - Living rooms: ≤35 dB LAeq,16hr
- Achieved through acoustic ducting, unit specification, and installation best practices.

7.4 Integration with Part O and TM59

- MVHR systems will include summer bypass or purge mode.
- Internal temperatures will be kept within acceptable ranges even where night ventilation via windows is restricted.

7.5 Verification and Certification

- Compliance will be confirmed by Building Control at completion, including:
  - Ventilation test certificates (Part F)
  - Acoustic specifications (Part E where applicable)
  - Thermal modelling support (Part O)

8.0 Conclusion

8.1 The Queensmere House development is constrained by unavoidable noise exposure, which precludes the use of open windows for ventilation at night. Attempts to meet acoustic and overheating standards through passive means have been exhausted.

8.2 The proposed MVHR strategy ensures:

- Internal acoustic criteria are maintained
- Ventilation and cooling needs are met
- Compliance with Part F, Part O and BS8233 is achieved
- Verification will occur through the Building Regulations process
- Additional benefits such as energy efficiency, air quality and humidity control are delivered – all of which enhance long-term occupant comfort and sustainability.

8.3 We respectfully request that this AVO Strategy Report be accepted as part of the planning application to mitigate the need for a planning condition.