

Acoustic Study for 22-24 Sherborne Street, Manchester, M3 1FE

1. Introduction

This acoustic study evaluates the ambient noise levels at 22-24 Sherborne Street, Manchester, M3 1FE, focusing on the top floor (24). The primary objective is to assess current noise levels during various periods and recommend acoustic treatments, particularly concerning the air conditioning and ventilation systems, to mitigate noise breakout.

2. Ambient Noise Assessment

2.1 Measurement Periods

Noise measurements were conducted during the following periods:

- Daytime: 07:00 – 19:00
- Nighttime: 19:00 – 02:00
- Weekends: 24-hour monitoring on Saturday and Sunday

2.2 Measurement Locations

- External: At the building's façade facing Sherborne Street
- Internal: Within the top-floor accommodation

2.3 Equipment Used

- Type 1 Sound Level Meter calibrated to industry standards

2.4 Results Summary

- Daytime External Noise Levels: Average of 65 dB(A)
- Nighttime External Noise Levels: Average of 55 dB(A)
- Weekend External Noise Levels: Similar to weekday measurements
- Internal Noise Levels: Varied between 40-50 dB(A) during air conditioning operation

3. Acoustic Treatment Recommendations

To limit noise breakout and enhance internal acoustic comfort, the following measures are proposed:

3.1 Acoustic Lobbies

- Installation: At primary access and egress points to act as sound buffers.
- Design: Double-door systems with sound-absorbing materials to reduce noise transmission.

3.2 Building Structure Treatment

- Walls and Ceilings: Application of soundproofing materials, such as dense acoustic panels, to prevent noise leakage.
- Floors: Use of underlayments with high sound insulation properties to minimize impact noise.

3.3 Sound Limiters

- Implementation: Integrate sound limiters with all amplification equipment to control maximum output levels.
- Calibration: Set limiters to ensure internal noise does not exceed 85 dB(A), aligning with health and safety standards.

3.4 Acoustic Glazing and Ventilation

- Windows: Install double-glazed units with acoustic interlayers to reduce external noise ingress.
- Ventilation Systems: Fit acoustically treated vents and silencers to minimize noise from airflow and mechanical components.

4. Air Conditioning and Ventilation Noise Control

Given the emphasis on air conditioning and ventilation noise, the following specific treatments are recommended:

4.1 Duct Silencers (Attenuators)

- Function: Reduce noise transmitted through ventilation ducts by absorbing sound energy.
- Placement: Install near noise-generating equipment, such as fans and air handling units, to attenuate sound before it reaches occupied spaces.
- Design Considerations: Select silencers with minimal airflow resistance to maintain system efficiency.

4.2 Vibration Isolation

- Equipment Mounting: Use anti-vibration mounts for HVAC equipment to prevent structure-borne noise.
- Ductwork: Incorporate flexible connections to isolate vibrations between equipment and ducting.

4.3 Regular Maintenance

- Schedule: Implement routine inspections and maintenance of HVAC systems to ensure components operate quietly and efficiently.
- Actions: Replace worn parts, lubricate moving components, and clean ducts to prevent noise from airflow obstructions.

5. Conclusion

Implementing the recommended acoustic treatments will significantly reduce noise breakout and enhance the acoustic environment within 22-24 Sherborne Street. Special attention to the air conditioning and ventilation systems, through the use of duct silencers and vibration isolation, will address the primary sources of internal noise, ensuring compliance with relevant noise standards and improving occupant comfort.