



ST JOHN STREET,
MANCHESTER

ADO (Overheating)
Noise Risk
Assessment

Reference: 13360.RP02.ADO.0

Prepared: 30 July 2025

Revision Number: 0

Enabl

16 Old Market Place
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ADO (Overheating) Noise Risk Assessment

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Revision	Comment	Date	Prepared By	Approved By
0	First issue of report	30 July 2025	James Melville	Joe Allen

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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and will need to be developed into full working drawings by the lead designer to incorporate all other design disciplines.



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1.0 INTRODUCTION

It is proposed to convert the existing office buildings at 8/8a St John Street back into residential premises. These properties are listed Georgian properties on the corner of St John Street and Longworth Street, close to Deansgate in Manchester City Centre. In addition to this, it is proposed to construct a new, detached, single family dwelling on land to the rear of the site.

RBA Acoustics has undertaken an initial assessment of the external noise levels affecting future residential dwellings at the development site.

Many buildings require closed windows to provide good internal acoustic conditions, however, opening a window is the normal way to keep a building cool, especially during the warmer summer months. These opposing requirements have become a major issue in the design of buildings, in particular for housing, especially given the requirement to avoid the widespread use of mechanical cooling.

Approved Document O of the Building Regulations Approved Document O (published 15 December 2021) covers the overheating mitigation requirements of the Building Regulations. Within the document, consideration is given to the potential for excessive levels of noise that may be experienced by occupants during the night-time if opening windows forms the overheating mitigation strategy. It provides noise level targets, stating that if noise levels exceed these values with windows open then occupants are likely to keep the windows closed. As such, the overheating strategy must take account of this.

A risk assessment has been undertaken that considers external noise levels across the site. This is to indicate the risk due to high internal noise levels based on opening windows to mitigate overheating and allow an appraisal of the site noise conditions with regards to overheating.

It should be noted that only the new build aspect of the development is formally subject to Approved Document O (ADO); however, for completeness the refurbishment aspect of the development has also been reviewed.

2.0 BUILDING REGULATIONS APPROVED DOCUMENT O (ADO)

Building Regulations Approved Document O (2021 edition) provides guidance for mitigating overheating within residential developments. The document states that the building should be constructed to meet the requirement using passive means as far as reasonably practicable. With regards to removing excess heat, the first choice is therefore to use openable windows to mitigate overheating.

The document provides a simplified method for demonstrating compliance and an alternative, more detailed, dynamic thermal modelling approach. With regards to acoustic impact the following references are made:

- 3.1 *The standards in this section may mean that the standards of the simplified method cannot be met. For example, if external noise is an issue, it is unlikely that windows would be opened by an occupant and therefore the minimum free areas of the simplified method cannot be met. In such cases, **dynamic thermal modelling** should be used.*

NOISE

- 3.2 *In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating strategy should take into account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*

- 3.3 *Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.*

- (a) 40 dB $L_{Aeq,T}$ averaged over 8 hours (between 11pm and 7am)
 (b) 55 dB L_{AFmax} more than 10 times a night (between 11pm and 7am)

- 3.4 *Where in-situ noise measurements are used as evidence of that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use.*

NOTE: *Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020)."*

With reference to the above Paragraph 3.3, the following limiting external free-field levels (as would be measured on a site prior to development) are implied (as no specific external threshold limits are provided directly). External noise levels above these values would not permit the use of the simplified method (as referred to in Paragraph 3.1) and dynamic thermal modelling should be used to demonstrate compliance:

Table 1* – External Noise Levels above which the Simplified Method cannot be Used

Parameter	Location at High Risk of Overheating	Location at Moderate Risk of Overheating
$L_{Aeq, 8h}$, averaged over 8 hours (between 23:00 – 07:00)	45dB	50dB
L_{AFmax} , more than 10 times a night (between 23:00 – 07:00)	60dB	65dB

* This table has been reproduced with reference to the IOA & ANC document 'Approved Document O Noise Guide Version 1.1 – November 2024'.

The following should be noted with regards to the above:

- High / Moderate Risk refers to the risk of overheating (not noise)
- High Risk areas cover most of central London and some of central Manchester
- Moderate Risk covers the rest of the country
- The noise thresholds are low and likely to be exceeded at most sites within towns and cities and also those in proximity to infrastructure / transport routes etc.

3.0 SITE DESCRIPTION

The site is shown in relation to its surroundings in the site plan in Figure 1 (Appendix B).

The application site is located on land north of St John Street. The existing office building will be retained and refurbished into residential accommodation and a new build building will be developed on the land north of the existing building.

The main noise sources affecting the proposed development are road traffic noise from the surrounding road network as well as noise from the nightclub to the east of the site.

4.0 ENVIRONMENTAL NOISE SURVEY

A full detailed description of the environmental noise measurements is outlined within our External Building Fabric Assessment 13360.RP01.EBF.3.30072025.JMM. The results of the survey are summarised in the following section.

4.1 Results

Unattended Survey

The typical L_{A90} and the period averaged L_{Aeq} noise levels measured are summarised in Table 1, along with typical L_{AFmax} levels measured during the night-time.

Table 2 – Measured Levels

Measurement Period	Typical Background Noise Level, $L_{A90,15min}$ (dB)	Time-Averaged Noise Level, $L_{Aeq,T}$ (dB)	Typical Maximum Noise Level, $L_{AFmax,5min}$ (dB)
Daytime (07:00 – 23:00)	50	58	N/A
Night-time (23:00 – 07:00)	44	62	85

Attended Survey

The period averaged L_{Aeq} noise levels measured are summarised in Table 2, along with L_{AFmax} levels measured during the attended measurements period.

Table 3 – Measured Levels

Position	Measurement Period	Time-Averaged Noise Level, $L_{Aeq,T}$ (dB)	Typical Maximum Noise Level, $L_{AFmax,5min}$ (dB)
2 – St John Street	03:05hrs - 04:14hrs 08/06/2024	59	76
3 - Longworth Street	02:30hrs - 03:00hrs 08/06/2024	61	76

6.0 PLANNING STAGE ‘ADO ASSESSMENT’

6.1 Noise Levels

External noise levels assumed in the assessment are based on the details provided in Section 4.0.

6.2 Assessment Methodology

This site, located in M3, falls within a medium-risk area for overheating as specified in Appendix C of Approved Document O (Areas with a high risk of its buildings overheating). As such, the external noise limits for allowing the use of the simplified methods are as follows:

- $L_{Aeq, 8h}$ averaged over 8 hours (between 23:00 – 07:00) 50 dB
- L_{AFmax} more than 10 times a night (between 23:00 – 07:00) 65 dB

Should these levels be exceeded externally, thermal dynamic modelling may show that lower free area requirements may still achieve the overheating criteria. This could still be achieved by fully opening windows. Experience indicates that fully opening a window offers in the region of 5dB to 10dB reduction from measured external noise level to internal level.

Based on the above, the following noise risk categorisation has been developed as outlined in Table 4.

Table 4 – Acoustics and Overheating External Noise Risk Categorisation

Noise Risk Category	External Night-time (23:00 to 07:00 hours) Façade Noise Levels		Description
	Average L_{Aeq} Levels (dB)	Typical L_{AFmax} Level (dB)	
A	< 50	< 65	Internal noise levels highly likely to be below ADO criteria.
B	≥ 50 to < 54	≥ 65 to < 69	Internal noise levels likely to be within ADO criteria.
C	≥ 54 to < 60	≥ 69 to < 75	Internal noise levels may be within ADO criteria, depending on window opening area.
D	≥ 60	≥ 75	Internal noise levels likely to be above ADO criteria.

6.3 Results

The façade incident noise levels have been used in the acoustics and overheating noise risk categorisation. The results of the assessment are given in Table 5.

Table 5 – Façade Incident levels and Risk Categorisation

Façade Position	Night-time L_{Aeq} Noise Level (dB)	Acoustics and Overheating External Noise Risk Categorisation	Typical Night-Time L_{AFmax}	Acoustics and Overheating External Noise Risk Categorisation
Existing Office Building Refurbishment				
North	61	D	76	D
East	61	D	76	D
South	61	D	76	D
West	59	C	76	D
New Build Development				
North	61	D	76	D
East	61	D	76	D
South	59	C	76	D
West	59	C	76	D

6.4 Discussion

The results of the assessment indicate that for ambient noise levels all facades of both buildings are in either category C or D and for L_{AFmax} noise levels all facades are in category D.

Based on the noise risk assessment, openable windows are not likely to be able to be relied on to mitigate overheating, regardless of the extent of restriction of the window opening. An appropriate overheating strategy will need to be developed that involves closed windows.

7.0 CONCLUSION

RBA Acoustics has undertaken an initial risk assessment of the external noise levels affecting future residential dwellings at the St Johns Manchester, with regards to the risk of overheating.

Noise levels measured at the site location are presented within this report and used in order to determine the risk to the development of fully opening windows during the night-time to alleviate overheating and the resultant impact on internal noise levels within future dwellings.

The measured levels are above the threshold values to allow a simplified assessment of overheating to be undertaken and, as such, dynamic thermal modelling is likely to be required to demonstrate compliance with the requirements of Building Regulations Approved Document O.

In terms of noise impact, the results of the assessment have identified that any opening of windows during the night-time to alleviate overheating leads to a risk of exceeding the internal noise level criteria. As such, the overheating mitigation strategy will need to consider windows closed.

Appendix A – Acoustic Terminology

A-weighting (e.g. dB(A))	A correction applied across the frequency bands to take into account the response of the human ear, and therefore considered to be more representative of the sound levels people hear.
DeciBel (dB)	Unit used for many different acoustic parameters. It is the logarithmic ratio of the level being assessed to a standard reference level.
$L_{eq,T}$	The level of a notional steady sound which, over a stated period of time, T , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
$L_{Aeq,T}$	The A-weighted level of a notional steady sound which, over a stated period of time, T , would have the same acoustic energy as the fluctuating noise measured over that period. Typically used to represent the average or ambient noise level.
L_{An} (e.g. L_{A10} , L_{A90})	The sound level exceeded for n% of the time. E.g. L_{A10} is the A-weighted level exceeded for 10% of the time and as such can be used to represent a typical maximum level. Similarly, L_{A90} is the level exceeded for 90% of the measurement period, and is often used to describe the underlying background noise.
$L_{Amax,T}$	The instantaneous maximum A-weighted sound pressure level which occurred during the measurement period, T . It is commonly used to measure the effect of very short duration bursts of noise, e.g. sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the ambient level.
Octave band	A frequency band in which the upper limit of the band is twice the frequency of the lower limit.
1/3 Octave band	A frequency band which is one-third of an octave band.

Appendix B – Site Plans



St John Street, Manchester
 Site Plan
 Project 13360

Figure 1
 30 July 2025
 Not to Scale

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