



202 Mauldeth Road

Noise Impact Assessment

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25089-R01-BT
Client: Longden & Cook
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REVISION HISTORY

Revision	Date	Revision Details	Author	Checked
R01	24/10/2025	Original Issue	 Ben Tomlin BSc MIOA	 Susan Witterick BSc MIOA

1 INTRODUCTION

- 1.1 dBx Acoustics Ltd has been appointed by Longden & Cook Real Estate Limited to carry out a noise impact assessment for a residential development at 202 Mauldeth Road, Burnage, Manchester M19 1AJ.
- 1.2 It is proposed to convert a ground floor former retail unit into a single one-bedroom apartment.
- 1.3 The local planning authority is Manchester City Council (MCC).
- 1.4 The intent of this report is to present the results of a noise survey undertaken at the site, to detail the subsequent noise impact assessment, and to provide outline guidance on appropriate acoustic requirements for façade, glazing, and ventilation build-ups to control noise intrusion in line with MCC's standard planning conditions.
- 1.5 A glossary of acoustic terminology has been supplied in Appendix A to assist the reader.

2 BASIS OF ASSESSMENT

Local Authority Criteria

- 2.1 This site falls under the jurisdiction of Manchester City Council (MCC).
- 2.2 Manchester City Council's *Planning & Noise Technical Guidance* (October 2022) sets out Manchester City Council's requirements with regard to current guidance and policy, with the aspiration that new developments achieve the highest standards without compromising the health and wellbeing of residents.
- 2.3 The guidance refers to the WHO Guidelines for Community Noise 1999, BS 8233:2014, BS 4142:2014, NPPF and NPSE as described below.
- 2.4 MCC has adopted the following internal noise limits for residential properties:
- *Bedrooms (night time 23:00-07:00h) 30dB_{L_{Aeq, 8h}} (individual noise events should not normally exceed 45dB_{L_{Amax,F}} by more than 10 times);*
 - *Living Rooms (daytime – 07:00-23:00h) 35dB_{L_{Aeq, 16h}}.*
 - *Gardens and terraces (daytime) 55dB_{L_{Aeq}}.*
- 2.5 MCC also requires that externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB_{L_{Ar,Tr}} below the typical background L_{A90} level at the nearest noise sensitive location.

BS 8233:2014: 'Guidance on sound insulation and noise reduction for buildings'

Indoor Ambient Noise Level Limits

- 2.6 BS 8233:2014 gives guidance for noise levels within residential properties. It discusses appropriate criteria for reasonable rest and sleep conditions and provides noise levels which are considered to provide appropriate conditions in accordance with WHO guidelines. The guidance on limits from the standard is reproduced in Table 1, below.

Table 1: Indoor Ambient Noise Limits (BS8233)

Activity	Location	07:00 – 23:00 hrs	23:00 – 07:00 hrs
Resting	Living room	35dB _{L_{Aeq, 16h}}	-
Dining	Dining room/area	40dB _{L_{Aeq, 16h}}	-
Sleeping (daytime resting)	Bedroom	35dB _{L_{Aeq, 16h}}	30dB _{L_{Aeq, 8h}}

- 2.7 It should be noted that these levels represent the average noise level over the 16-hour day or 8-hour night period. This potentially means that higher noise levels may be experienced internally over a shorter period (e.g., individual passing trams or vehicles). These equivalent noise levels, over a period of time, are the best representation of the average noise level and are generally the main focus when it comes to evaluating noise exposure.

- 2.8 To assess the maximum noise levels, the World Health Organisation (WHO) document “Guidelines for Community Noise: 1999” recommends that maximum noise levels ($\text{dBL}_{\text{Amax,F}}$) do not exceed $45\text{dBL}_{\text{Amax,F}}$ more than 10-15 times a night.

The Building Regulations 2010: Overheating: Approved Document O

- 2.9 Section 3 of Overheating: Approved Document O (ADO) states the following;

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 mitigation strategy should take 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. $40\text{dBL}_{\text{Aeq,T}}$, averaged over 8 hours (between 11pm and 7am).

B. $55\text{dBL}_{\text{AFmax}}$ more than 10 times a night (between 11pm and 7am).

3.4 Where in-situ noise measurements are used as evidence 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.

- 2.10 It is also highlighted that guidance on reducing the passage of external noise into buildings can be found in the Association of Noise Consultants’ ‘Acoustics, Ventilation and Overheating: Residential Design Guide’ (2020).

Acoustics, Ventilation and Overheating: Residential Design Guide 2020 (AVO)

- 2.11 AVO outlines a two-level procedure to estimate the potential impact on occupants in the case of the overheating condition.
- 2.12 The AVO Level 1 assessment is used to determine the 'Potential Effect without Mitigation' and to establish if there is a requirement for a Level 2 Assessment.
- 2.13 A level 1 assessment is undertaken by comparing the external noise levels measure to the values shown on Table 3-2 of AVO, reproduced as Figure 1, below.

Figure 1 : AVO Table 3-2, Guidance for Level 1 Site Risk Assessment

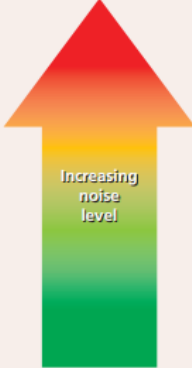
Table 3-2 Guidance for Level 1 site risk assessment of noise from transport noise sources ^[Note 1] relating to overheating condition

Risk category for Level 1 assessment ^[Note 5]	Potential Effect without Mitigation	Recommendation for Level 2 assessment
$L_{Aeq, T}$ ^[Note 2] during 07:00 - 23:00 $L_{Aeq, 8hr}$ during 23:00 - 07:00 65 dB 55 dB 60 dB 50 dB 55 dB 45 dB	Increasing risk of adverse effect	Recommended Optional
Negligible	Use of opening windows as primary means of mitigating overheating is not likely to result in adverse effect	Not required

- 2.14 If required, a Level 2 assessment is then undertaken by comparing the predicted internal noise levels to Table 3-3 of AVO, reproduced as Figure 2, below.

Figure 2 : AVO Table 3-3, Guidance for Level 2 Assessment

Table 3-3 Guidance for Level 2 assessment of noise from transport noise sources^[Note 1] relating to overheating condition

Internal ambient noise level ^[Note 2]			Examples of Outcomes ^[Note 3]	
$L_{Aeq,T}$ ^[Note 4] during 07:00 – 23:00 ^[Note 4]	$L_{Aeq,8h}$ during 23:00 – 07:00	Individual noise events during 23:00 – 07:00 ^[Note 4]		
> 50 dB	> 42 dB	Normally exceeds 65 dB L_{Amax}	Noise causes a material change in behaviour e.g. having to keep windows closed most of the time	Avoiding certain activities during periods of intrusion. Having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.
 Increasing noise level			Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night	At higher noise levels, more significant behavioural change is expected and may only be considered suitable if occurring for limited periods. As noise levels increase, small behaviour changes are expected e.g. turning up the volume on the television; speaking a little more loudly; having to close windows for certain activities, for example ones which require a high level of concentration. Potential for some reported sleep disturbance. Affects the acoustic environment inside the dwelling such that there is a perceived change in quality of life. At lower noise levels, limited behavioural change is expected unless conditions are prevalent for most of the time. ^[Note 4]
≤ 35 dB	≤ 30 dB	Do not normally exceed L_{Amax} 45 dB more than 10 times a night	Noise can be heard, but does not cause any change in behaviour	Noise can be heard, but does not cause any change in behaviour, attitude, or other physiological response ^[Note 4] . Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.

- 2.15 It can be seen from the figures above that there are no strict numerical limits for an acceptable level of noise within residences during the overheating condition.
- 2.16 Table 3-3, however, does suggest that night-time noise levels of $\geq 42 \text{ dB}_{L_{Aeq,8\text{hour}}}$ or $65 \text{ dB}_{L_{Amax,F}}$ can be considered upper limits for acceptable noise levels in rooms in which overheating is controlled by the use of open windows.

BS 4142:2014 – Methods for Rating and Assessing Industrial and Commercial Sound

- 2.17 BS 4142:2014 sets out a procedure for assessing noise impact whereby a Noise Rating is determined and compared with the existing local Background Sound Level.
- 2.18 MCC requires that externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of $5\text{dB}_{\text{L}_{\text{Ar,Tr}}}$ below the typical background L_{A90} level at the nearest noise sensitive location.
- 2.19 The Rating Level ($\text{dB}_{\text{L}_{\text{Ar,Tr}}}$) is evaluated from the Specific Noise Level by including several, cumulative corrections to account for factors such as distinguishable tone, impulse, intermittency or other readily distinguishable sound characteristics.
- 2.20 BS 4142:2014 seeks to determine a “representative” Background Sound Level, stating that
“...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.
- 2.21 The assessment of the impact depends upon the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level. An initial estimate of the impact of the specific sound is made by subtracting the Background Sound Level from the Rating Level, while considering the following points:
- a) Typically, the greater this difference, the greater the magnitude of the impact.
 - b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
 - d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

National Planning Policy Framework

- 2.22 The revised National Planning Policy Framework (NPPF, last updated December 2023) supersedes the previous versions of the NPPF. The purpose of the planning system is to contribute to the achievement of sustainable development. There are three dimensions to sustainable development: economic, social and environmental. The environmental role is to contribute to protecting and enhancing our natural, built and historic environment; and as part of this, make effective use of land, help to improve biodiversity, use natural resources prudently, minimise waste and pollution, and mitigate to adapt to climate change including moving to a low carbon economy.
- 2.23 One of the core planning principles is to contribute to conserving and enhancing the natural environment. The planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability (Paragraph 180).
- 2.24 Paragraph 191 of the NPPF states:
- “Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:
- Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life (see Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food and Rural Affairs, 2010));
 - Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.”
- 2.25 Additionally, Paragraph 193 states:
- “Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

Noise Policy Statement for England

- 2.26 The Noise Policy Statement for England (NPSE, March 2010) aims to “through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:
- Avoid significant adverse impacts on health and quality of life;
 - Mitigate and minimise adverse impacts on health and quality of life; and
 - Where possible, contribute to the improvement of health and quality of life”.
- 2.27 Based on concepts from toxicology, it introduces three ‘Effect Levels’ relevant to the assessment of noise. These are:
- NOEL: No Observed Effect Level: This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
 - LOAEL: Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected; and
 - SOAEL: Significant Observed Adverse Effect Level: This is the level above which significant adverse effects on health and quality of life occur.

Planning Practice Guidance

2.28 The Planning Practice Guidance for Noise (PPG-N) was published in March 2014 and most recently updated in February 2024. The PPG-N suggests that the most appropriate and cost-effective solutions to potential noise issues are best identified when good acoustic design needs to be considered early in the planning process.

2.29 The PPG-N provides the following advice on how to determine the noise impact on development:

“Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.”

In line with the Explanatory note of the noise policy statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.” (Paragraph 003 Reference ID 30-003-20190722).

2.30 The document goes on to acknowledge the levels of noise exposure at which an effect may occur as provided in the NPSE and introduces a fourth effect level:

- UAE: Unacceptable Adverse Effect: Extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise lead to psychological stress or physical effects.

2.31 Where residential development is proposed in the vicinity of existing businesses, community facilities or other activities that produce noise, the PPG-N advises that the applicant (or ‘agent of change’) will need to clearly identify the effects of the existing businesses that may cause a nuisance (including noise) and clearly define the mitigation measures being proposed to address any potential significant adverse effects that are identified. The agent of change needs to not only consider the current activities of the business, but the permitted activities too, even if they are not occurring at the time of the application being made. The PPG-N acknowledges that:

“It can be helpful for developers to provide information to prospective purchasers or occupants about mitigation measures that have been put in place, to raise awareness and reduce the risk of post-purchase/occupancy complaints.” (Paragraph 009 Reference ID 30-009-20190722).

- 2.32 It is important to understand that as the PPG-N does not specifically provide any advice with respect to noise levels/limits for different sources of noise, it is appropriate to consider other sources of advice and guidance documents when considering whether new developments would be sensitive to the prevailing acoustic environment and the PPG-N signposts a number of appropriate guidance documents.

Table 2 : Noise Exposure Hierarchy

Perception	Examples of outcomes	Increasing effect level	Action
Not noticeable	No effect	No observed effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life	No observed adverse effect	No specific measures required
		Lowest observed adverse effect level (LOAEL)	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude. E.g. turning up the volume of the television; speaking more loudly; where there is no alternative ventilation, having to close windows are some of the time because of the noise. Potential for some reportedly disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
		Significant observed adverse effect level (SOAEL)	
Noticeable and disruptive	The noise causes material change in behaviour and/or attitude e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep the windows closed most of the time because of the noise. Potential for sleep disturbance result in difficulty in getting to sleep. Premature awakening and difficulty getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant observed adverse effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise leading to psychological stress or psychological effects e.g. regular sleep deprivation/awakening; loss of appetite; significant, medically definable harm e.g. auditoria and non-auditory	Unacceptable adverse effect	Prevent

3 SITE DESCRIPTION

- 3.1 The proposed development site is located on the ground floor of 202 Mauldeth Road, Burnage, Manchester M19 1AJ.
- 3.2 Above the development is an existing apartment. To each side are a restaurant (Ariyan), and another empty retail unit.
- 3.3 The site will be developed into a single one-bed apartment.
- 3.4 The rear of the site comprises a small garden, and a locked alleyway serving the rear of the surrounding properties.
- 3.5 The primary noise source affecting the site is road traffic on Mauldeth Road, and the more distant Kingsway, and plant serving a takeaway (believed to be Canadian Charcoal Pit).
- 3.6 A site location plan is provided as Figure 3, below, which shows the location of the site, noise sensitive receptors (NSRs) and the surrounding area.

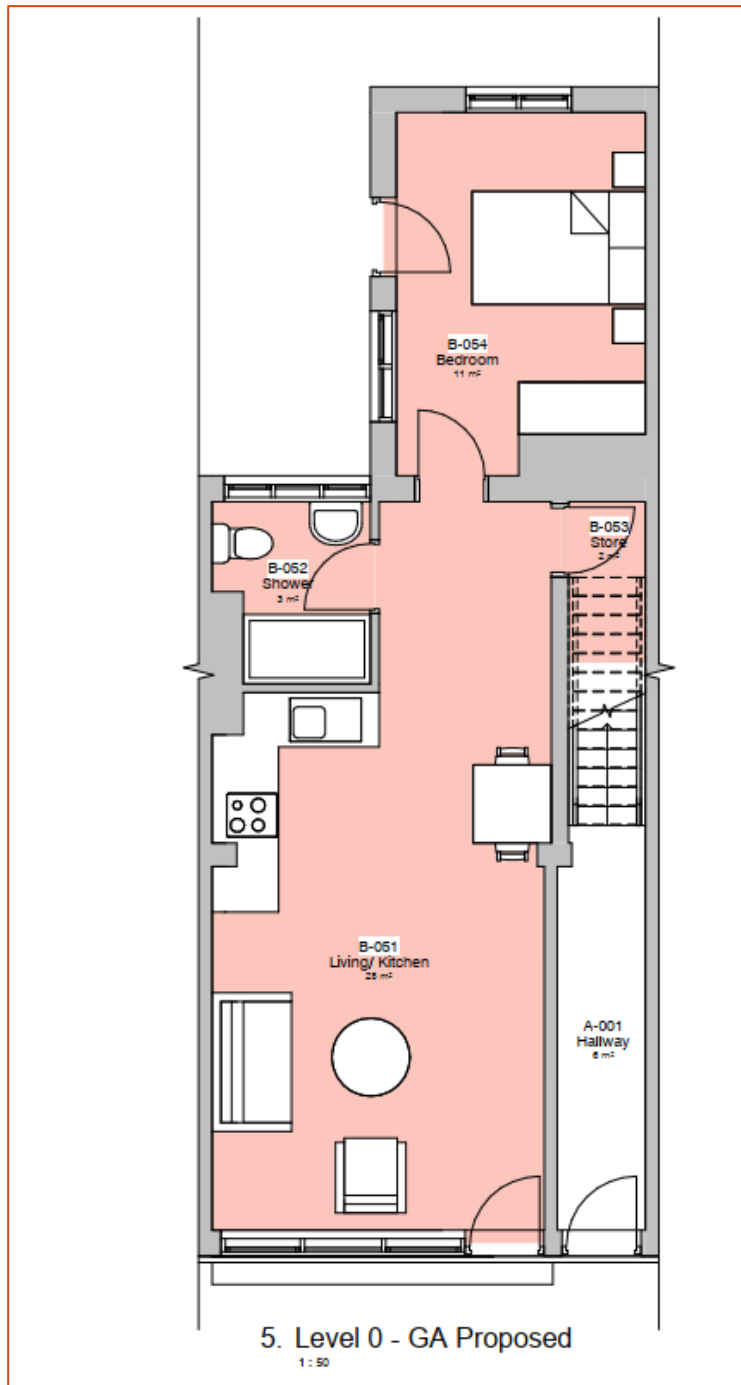
Figure 3 : Site and Noise Sensitive Receptors



- 3.7 The nearest noise sensitive receptors are the residential dwellings on Broadhill Road.

3.8 Figure 4, below, shows the proposed apartment layout.

Figure 4: Proposed Apartment Layout



4 ENVIRONMENTAL NOISE SURVEY

Methodology

- 4.1 dBx Acoustics has undertaken attended and unattended noise measurements at the site to establish the existing ambient and background noise levels affecting the site and its surroundings.
- 4.2 Attended noise surveys were carried on Thursday 16th October 2025 (daytime including rush hour) at the front of the building on Mauldeth Road.
- 4.3 The daytime measurements were carried out generally in accordance with the shortened measurement procedure detailed in the Calculation of Road Traffic Noise (CRTN) document (Department of Transport (Welsh Office), 1988). The daytime measurements also included the rush hour period, in accordance with MCC requirements.
- 4.4 A long-term logging sound level meter was set up at the rear of the property between around 15:00h on 16/10/2025 and 15:00h on 17/10/2025, capturing a full 24 hours of daytime and night time data.
- 4.5 Measurements were undertaken in accordance with BS 7445-1:2003 'Description and Measurement of Environmental Noise', with microphones located at approximately 1.5m above the local ground level.
- 4.6 All measurements were less than 3.5 metres away from reflective surfaces and hence are façade measurements.
- 4.7 All measurements were made in 15-minute periods.

Equipment

- 4.8 The equipment used during the environmental noise survey is detailed in Table 3, below.

Table 3: Equipment Used in the Environmental Noise Survey

Equipment	Attended		Unattended	
	(Manufacturer & Part No./ Serial Number)	Serial Number	(Manufacturer & Part No./ Serial Number)	Serial Number
Meter	NOR 140	1403443	CR:171B	G300741
Pre-Amp	NOR 1209	12967	MV:200F	9082F
Microphone	NOR 1225	18437	MK:224	211753D
Calibrator	B&K 4231	1821323	CR:515	87160

- 4.9 The sound level meters were calibrated before and after measurements, with no significant drift recorded. An accredited laboratory calibrated the equipment not more than two years prior to the measurements being made, with the exception of the calibrators, which had been calibrated not more than one year prior to the survey.

Weather Conditions

- 4.10 The temperature during the noise survey varied between 5°C and 11°C.
- 4.11 Weather conditions during the measurement period were generally cool, with scattered clouds.
- 4.12 Wind speeds were within suitable parameters for the measurement of environmental noise (i.e. generally under 5ms⁻¹).
- 4.13 The microphones were protected with windshields for the duration of the survey.

5 ENVIRONMENTAL NOISE SURVEY RESULTS

Noise Survey - Attended

- 5.1 A summary of the daytime noise levels measured at the front of the building is presented in Table 4, below.
- 5.2 Measurements were taken over 15-minute periods, in 3 consecutive hours between 10:00h and 17:00h, in accordance with the shortened measurement procedure in Calculation of Road Traffic Noise (CRTN). The measurement period also included the rush hour period, between around 16:55h and 17:10h.

Table 4: Summary of Attended Daytime Noise Survey Results

Time (hh:mm)	L _{Aeq} (dB)	L _{A10} (dB)	L _{A90} (dB)
14:56-15:11	60	63	51
10:00-16:15	59	62	49
16:56-17:11	61	64	51

- 5.3 All measurements were façade, and hence to determine the free-field noise levels, a -3dB correction is applied.
- 5.4 There is a bus stop outside the property. The timetable was consulted, and there is one bus every hour, at around 5 minutes past the hour. These bus movements were therefore captured in the survey.

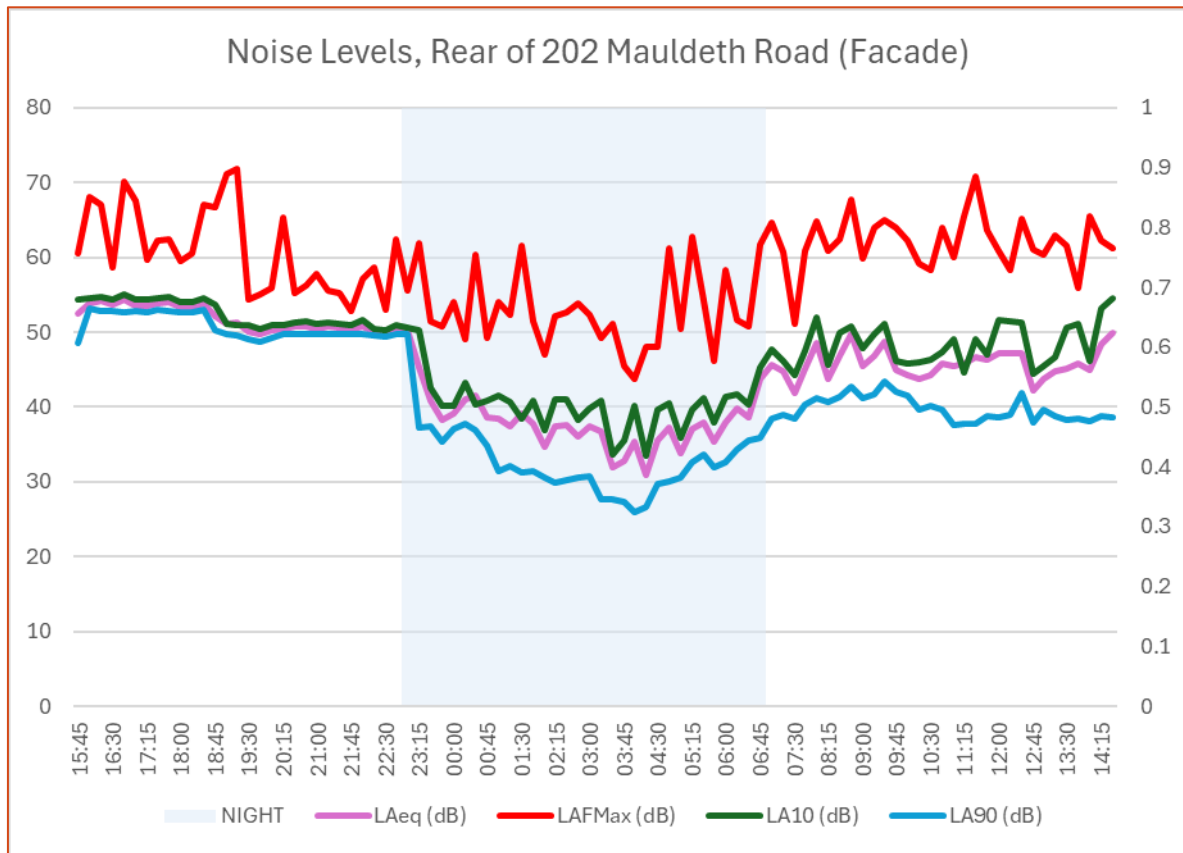
Noise Survey - Unattended

- 5.5 A summary of the noise levels measured at the rear of the building is presented in Table 5, with the full data provided as Figure 5, below.

Table 5: Summary of Attended Daytime Noise Survey Results

Date	Date and Time (hh:mm)	L _{Aeq,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)	L _{Amax,F} (dB)
16 October	15:45h-23:00h	52	54	50	-
	23:00h-07:00h	40	-	31	63
17 October	07:00h-14:45h	45	48	38	-

Figure 5: Measured Noise Levels, Rear



- 5.6 It can be seen from the graph above that the plant serving the nearby takeaway appears to start operating at around 15:00h, and runs until around 23:00h. As noise from the plant is higher than the early morning data, this has been used in the break-in calculations.
- 5.7 Based on the CRTN methodology, the data shown in Tables 4 and 5, above, can be used to determine the 16-hour daytime ambient noise level.
- 5.8 The logarithmic average of the dB_{LA10} values provides the 3-hour average, $dB_{LA10,3hour}$, or the 3 hour average of the logger is used. This is converted to the 18-hour $dB_{LA10,18hour}$ value by subtracting 1dB. This is then converted to the 16-hour ambient noise level, $dB_{LAeq,16hour}$, by subtracting a further 2dB.
- 5.9 The results of these calculations are presented in Table 6, below, compared with the logarithmic average of the ambient noise levels measured during 10:00h-17:10h (including during the rush hour period).
- 5.10 The higher value of the two has been used in the assessment.

Table 6: Comparison of Ambient Noise Levels (Daytime)

Location	Average Ambient Noise Level, $dB_{LAeq,T}$	CRTN Ambient Noise Level, $dB_{LAeq,16hour}$	Value Used in Assessment, $dB_{LAeq,16hour}$	Free-field corrected Value Used, $dB_{LAeq,16hour}$
Front	60	60	60	57
Rear	52	51	52	49

Restaurant Noise

- 5.11 There is a café adjacent to the proposed site, with an external seating area.
- 5.12 Although noise from this is not expected to be significant, an assessment is provided below.
- 5.13 The outdoor seating area can accommodate up to around 40 patrons (estimated).
- 5.14 Noise levels in the external seating area have been determined using the calculation method presented in the J.H. Rindel, C.I.Christensen, A.C. Grade research paper: *'Dynamic sound source for simulating the Lombard effect in room acoustic modelling software'* (Proceedings of Inter-Noise 2012, New York, USA, (2012)).
- 5.15 As a worst case, it has been deemed appropriate to use a noise level representative of 'raised speech' conversation levels. The sound power level of a person speaking in a raised voice is equal to roughly 76dBL_{WA} (ref. ANSI 3.5).
- 5.16 Converting this to allow for a group of people in the proposed seating area was done using the following method.
- 5.17 The first step is to calculate the number of speaking persons (NS) at any one time, where N is the total number of persons (40) and G is the assumed group size (typically 3.5).
- 5.18 In this scenario, this equates to up to 12 people speaking (40/3.5).
- 5.19 Taking into account the number of people speaking and the sound power level of raised conversation (76dBL_{WA}), the resultant sound power level would be around 98dBL_{WA} (calculated from 20log(NS)).
- 5.20 The equation shown below is then used to convert the sound power level to a sound pressure level, where r is the distance to the nearest noise sensitive receiver, and AS is any acoustic screening to the NSR.
- Sound pressure level, $L_p = L_{WA} - 20\log(r) - 8 - AS$, where;
 - $L_{WA} = 96\text{dB}$
 - $r = 10\text{m}$ (typical distance to window)
 - $AS = 5\text{dB}$
- 5.21 Which therefore equates to $96 - 20 - 8 - 5 = 63\text{dBL}_{Aeq,T}$
- 5.22 Assuming as a worst case the outdoor seating area is assumed to be in use between around 15:00h and 23:00h, this equates to half of the 16 hour daytime period, and hence a reduction of 3dB is applied to obtain the daytime average (i.e. around 60dBL_{Aeq,T}).
- 5.23 This is an absolute worst case; it assumes that 12 people simultaneously speak with raised voices for 8 hours, constantly. This is highly unlikely to occur in practice. However, this could potentially represent an absolute worst case one hour period.
- 5.24 If half the people were present, then noise levels would reduce by 6dB. If normal speaking volume is considered, then noise levels reduce by a further 8dB ('Normal' speech noise levels are some 8dB lower than 'raised' voices). Therefore, in most usual circumstances, noise levels associated with the restaurant would be significantly lower than that predicted, and lower than road traffic noise levels.
- 5.25 However, as a worst case, and to account for the character of the noise, this level has been used in the assessment.

- 5.26 When added to the road traffic noise, this would therefore result in an overall worst case noise level of 62dBL_{Aeq,16hr}.

Overall

- 5.27 Taking all of the above into account, and corrected from façade to free-field noise levels, the noise levels used in this assessment are shown in Table 7, below.

Table 7: Free-Field Noise Levels Used in Assessment

Location	Daytime Ambient, dBL _{Aeq,16hr}	Night-time Ambient, dBL _{Aeq,8hr}	Night-time Maximum, dBL _{Amax,F}
Front (Living)	62	-	-
Rear (Bedroom)	49	37	60

6 BUILDING ENVELOPE SOUND INSULATION

External Noise Break-In Assessment

- 6.1 An external noise break-in assessment has been undertaken to determine the minimum sound insulation performance of the façades required to meet the internal noise criteria.
- 6.2 It should be noted that the assessment undertaken is indicative at this stage as the building arrangement, building heights and room layouts are not available. A detailed external noise ingress assessment should be undertaken during subsequent design stages once building arrangement and room layouts are confirmed.
- 6.3 Based on a typical reduction in external noise levels to indoor noise levels of 15dB for a partially opened window (based on WHO guidance), allowable external noise levels for compliance with BS 8233:2014 are therefore 50dBL_{Aeq,T} in the day, and 45dBL_{Aeq,T} and 60dBL_{Amax,F} at night for bedrooms.
- 6.4 With reference to the measured noise levels, and the allowable external noise levels detailed above, the required indoor noise levels can only be achieved with closed windows.
- 6.5 On this basis, the sound insulation performances of the glazing and ventilation required to achieve the BS8233 noise limits within the proposed development are presented in Table 8, below.

Table 8: Glazing and Ventilator Sound Insulation Performance Requirements

Façade	Glazing Sound Insulation Performance, dB R _w (+ C _{tr})	Example Glazing Construction, mm	Ventilator Sound Insulation Performance, dB D _{n,e,w}
All	31(-6)	4/TC/4	26

TC = Thermal Cavity

- 6.6 The sound insulation performances detailed must be achieved by the glazing unit as a whole, including frames, seals, opening lights etc, as opposed to the glass alone.
- 6.7 The glazing configurations shown above are a suggestion only, and alternative configurations may be acoustically suitable.

- 6.8 The external wall and roof should achieve a sound insulation performance at least 10dB greater than the glazing. This can be easily achieved with cavity masonry walls and a tiled roof.
- 6.9 Windows can be openable at occupant discretion (e.g. for purge ventilation) but must be well sealed when closed.

Overheating

- 6.10 At this stage, an overheating assessment has not been completed. This initial guidance is therefore presented on the basis that an overheating condition may arise, but will need to be reviewed as the scheme progresses.
- 6.11 Approved Document O is based on guidance in the Association of Noise Consultants' document '*Acoustics, Ventilation and Overheating Guide*' (2020) (AVO).

AVO Level 1 Assessment

- 6.12 The AVO Level 1 Assessment is used to determine the 'Potential Effect without Mitigation' and to establish if there is a requirement for a Level 2 Assessment.
- 6.13 AVO indicates that a Level 2 assessment is 'recommended' when $65\text{dBL}_{\text{Aeq},16\text{hour}}$ (daytime) and $55\text{dBL}_{\text{Aeq},8\text{hour}}$ or $78\text{dBL}_{\text{AF},\text{max}}$ (night-time) or is exceeded.
- 6.14 The Level 1 Assessment is summarised in Table 9, below.

Table 9: AVO Level 1 Assessment

Façade Location	Typical Daytime Noise Levels ($\text{dBL}_{\text{Aeq},\text{T}}$)	Typical Night-time Noise Levels ($\text{dBL}_{\text{Aeq},\text{T}}$)	Highest Night-time Noise Levels ($\text{dBL}_{\text{Amax},\text{F}}$)	Risk Category	AVO Recommendation for Level 2 Assessment
Front	62	-	-	High	Recommended
Rear	-	35	60	Negligible	Not required

- 6.15 On this basis, a Level 2 Assessment is presented below.

AVO Level 2 Assessment

- 6.16 For the Level 2 assessment, there are no definitive criteria proposed, only a sliding scale of 'Increasing likelihood of impact on reliable speech communication during the day or sleep disturbance at night'.
- 6.17 However, internal noise level limits of $50\text{dBL}_{\text{Aeq},16\text{hour}}$ in the day, and $42\text{dBL}_{\text{Aeq},8\text{hour}}$ and $65\text{dBL}_{\text{Amax},\text{F}}$ at night are the limits at which '*Noise causes a material change in behaviour e.g. having to keep windows closed most of the time....Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep.*'
- 6.18 These limits would therefore appear to be a worst-case upper limit. Furthermore, any adverse effects relating to noise are affected by both the noise level itself, and the duration (how long overheating occurs) and frequency (how many times per year/month) the overheating condition occurs.
- 6.19 AVO specifies an expected reduction from external to internal noise levels of -13dB when a window is open. On this basis, the predicted indoor ambient noise levels assuming windows open for the control of overheating during daytime is shown in Table 10, below and for night-time is shown in Table 10.

Table 7: AVO Level 2 Assessment- Daytime (Front Facade)

Parameter	All Facades
External Ambient Noise Level, $dB_{Aeq,16hr}$	62
Reduction, open window, dB	-13
IANL Day-time ($dB_{Aeq,16hr}$)	49
Upper Limit Outlined in AVO	$>50dB_{Aeq,16h}$
Exceedance	-1

- 6.20 It can be seen that during the daytime periods, the IANL with windows open to control overheating could not exceed the upper limit suggested by AVO.
- 6.21 Therefore, the use of opening windows as primary means of mitigating overheating is not likely to result in adverse effect.

7 SEPARATING FLOOR

- 7.1 The first floor of the building is an apartment, and is owned by the developers of the ground floor. On this basis, this is not a Planning issue, but falls under the jurisdiction of Building Control. However, an outline assessment is provided below.
- 7.2 The floor will need to meet the requirements of Approved Document E, i.e. an airborne sound insulation performance of at least $43dB_{nT,w} + C_{tr}$, and an impact sound insulation performance of lower than $64dB'_{nT,w}$.
- 7.3 Detailed design of this floor is outside the scope of this report, but the existing timber floor can be easily upgraded to meet these requirements, for example, with a resiliently supported mass layer ($20kg/m^2$ or higher) on the top floor, with an independent plasterboard ceiling below.
- 7.4 This is just an example and there are many floor constructions which meet the requirements. This should be reviewed as part of the design process.

8 BUILDING SERVICE NOISE EMISSIONS

- 8.1 Any new items of building services plant should be designed to achieve a cumulative Rating Level of at least 5dB below the typical background noise level at the nearest noise sensitive receptors when assessed in accordance with BS 4142:2014.
- 8.2 The nearest noise sensitive receptors are residential properties at the rear of the site, on Broadhill Road.
- 8.3 Based on the background noise levels detailed in Table 5 and Table 6, suitable limits to which the cumulative plant noise level should adhere are set in Table 11, below.

Table 11: Plant Noise Emission Limits

Noise Sensitive Receptor (Figure 3)	Building Services Plant Noise Emission Limit, dBL _{Ar,Tr}	
	Daytime Period (07:00h – 23:00h)	Night-time Period (23:00h – 07:00h)
All NSRs	33	26

9 CONCLUSION

- 9.1 dBx Acoustics Ltd has been appointed by Longden & Cook Real Estate Limited to carry out a noise impact assessment for a residential development at 202 Mauldeth Road, Burnage, Manchester M19 1AJ.
- 9.2 It is proposed to convert a ground floor former retail unit into a single one-bedroom apartment.
- 9.3 Attended noise surveys were carried on 16th and 17th October 2025. An assessment of potential restaurant noise was also undertaken.
- 9.4 Using these noise levels, calculations have been undertaken to determine the requirements for glazing and the ventilators to achieve internal noise level limits in compliance with BS8233:2014. Standard thermal glazing and standard trickle vents are found to adequately control noise.
- 9.5 It is not known at this stage whether an overheating condition will occur. However, an indicative AVO assessment of noise levels has been undertaken assuming that it may occur.
- 9.6 An outline assessment of the requirements of the separating floor has been undertaken.
- 9.7 Plant noise limits have been set such Manchester City Council's plant noise limit is achieved.
- 9.8 Taking the above into account, noise should not be a limiting factor in any planning application.

APPENDIX A – GLOSSARY OF ACOUSTIC TERMINOLOGY

Decibel, dB	A unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. For sound pressure level (L_p) the reference quantity is 2×10^{-5} N/m ² . The sound pressure level existing when microphone measured pressure is 2×10^{-5} N/m ² is 0 dB, the threshold of hearing.
L	Instantaneous value of Sound Pressure Level (L_p) or Sound Power Level (L_w).
Frequency	Number of cycles per second, measured in hertz (Hz), related to sound pitch.
A-weighting	Arithmetic corrections applied to values of L_p according to frequency. When logarithmically summed for all frequencies, the resulting single "A weighted value" becomes comparable with other such values from which a comparative loudness judgement can be made, then, without knowledge of frequency content of the source.
$L_{eq,T}$	Equivalent continuous level of sound pressure which, if it actually existed for the integration time period T of the measurement, would possess the same energy as the constantly varying values of L_p actually measured.
$L_{Aeq,T}$	Equivalent continuous level of A weighted sound pressure which, if it actually existed for the integration time period, T, of the measurement would possess the same energy as the constantly varying values of L_p actually measured.
$L_{n,T}$	L_p which was exceeded for n% of time, T.
$L_{An,T}$	Level in dBA which was exceeded for n% of time, T.
L_{Fmax}	The instantaneous maximum sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
L_{AFmax}	The instantaneous maximum A weighted sound pressure level which occurred during the measurement. F indicates that the fast time-weighting is used.
$L_{Ar,Tr}$	The rating level: the equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise.
Reverberation Time, T	The time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped. The descriptor T, often includes other nomenclature to describe the type of reverberation time measurement or if the reverberation time is an average taken for specific frequencies. For example, a T_{mf} is the mid-frequency reverberation time.
Absorption Coefficient, α	The fraction of reverberant sound energy absorbed by a material. It is expressed as a value between 1.0 which equates to perfect absorption and 0 which equates to zero absorption.
Acoustic Class, A - E	Classification of sound absorbers into Sound Absorption Classes A-E, according to BS EN ISO 11654, including frequencies 200-5000 Hz
NRC	A single-number rating system used to compare the sound-absorbing characteristics of building materials. A measurement of the acoustical absorption performance of a material, calculated by averaging its Sound Absorption Coefficients at 250, 500, 1000 and 2000 Hz
STI	Speech Transmission Index , Metric ranging between 0 and 1 representing the transmission quality of speech with respect to intelligibility by a speech transmission channel
R	Sound Reduction Index , the laboratory measured sound insulation properties of a material or building element in octave or third octave bands.
R_w	Weighted Sound Reduction Index , a single number which represents the sound reduction of a material. It is derived by plotting the sound reduction index against a set of reference curves. The curves are shifted until a best-fit is established and the curve which best fits the sound reduction spectrum is used to represent the single figure value.
D_w	Weighted Level Difference , the weighted level difference between a pair of rooms, stated as a single figure.

D_{nT}	Standardised Level Difference, a frequency-dependent measurement of airborne sound insulation, calculated using the following formula: $D_{nT} = L_1 - L_2 + 10\log(T/T_0)$ dB Where: L_1 is the energy-averaged sound pressure level due to the pink noise source measured in the source room using a sweep technique. L_2 is the energy-averaged sound pressure level measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (= 0.5s for dwellings).
$D_{nT,w}$	Weighted Standardised Level Difference, a single-figure value of airborne sound insulation performance, derived according to procedures in BS EN ISO 717-1, based on the D_{nT} values at different frequencies (100-3150 Hz third octave bands).
$D_{n,F,w}$	Weighted, Normalised Flanking Level Difference, the normalised, weighted difference in sound level between a pair of rooms via a flanking element, such as mullion or ceiling detail. The level difference in octave bands is first normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
D_{ne}	Normalised Element Level Difference. The normalised difference in sound level between a pair of rooms via a small element such as a trickle ventilator. The level difference in octave bands is normalized to a reference amount of absorption.
$D_{n,e,w}$	Weighted, Normalised Element Level Difference. The normalised, weighted difference in sound level between a pair of rooms via a small element such as a trickle ventilator, stated as a single figure. The level difference in octave bands is normalized to a reference amount of absorption and then plotted against a set of reference curves to establish a single figure value.
C_{tr}	Spectrum Adaptation Term, a correction term applied to the sound insulation single-number values (R_w, D_{wT}, and $D_{nT,w}$) in accordance with BS EN ISO 717-1. Applying the C_{tr} penalises a construction's performance if its low frequency performance is poor in relation its performance at higher frequencies.
Impact Sound	The noise generated by an impact on a structure. This is normally used to describe the noise created by people walking or moving furniture on a floor structure.
L_{nT}	Standardised Impact Sound Pressure Level, a frequency dependent measurement of impact sound insulation, calculated using the following formula: $L_{nT} = L_1 + 10\log(T/T_0)$ dB Where: L_1 is the mean sound pressure level due to the tapping machine measured in the receiving room using a sweep technique. T is the mean receiving room reverberation time (derived from T_{30} measured in seconds). T_0 is the reference reverberation time (0.5s for dwellings)
$L'_{nT,w}$	Weighted Standardised Impact Sound Pressure Level, a single-figure value (@ 500 Hz) of impact sound insulation, performance, derived according to BS EN ISO 717-2, based on the L_{nT} values at different frequencies (100Hz- 3150 Hz third octave bands).
Insertion Loss, IL	The reduction of noise level due to the presence of a noise control device such as an attenuator, excluding any regeneration noise created by its presence.
NR	The Noise Rating level. This is a single figure value derived by plotting a noise spectrum against a set of curves. The curve under which the spectrum fits is the resulting NR level.

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