



WSP

95 OXFORD STREET, MANCHESTER

NOISE ASSESSMENT FOR PLANNING PURPOSES

01 December 2022

AEC REPORT: P4751/R01a/WJK

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1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by WSP on behalf of the client to undertake a noise assessment in relation to the proposed change of use from existing retail unit to /a takeaway / restaurant on the ground floor of the premises at 95 Oxford Street, Manchester.
- 1.2 Following the submission of the planning application, the following requirements relating to noise were received from Manchester City Council:

3) An acoustic assessment under the requirements of paragraph 180 of the National Planning Policy Framework, (Core Strategy DM1 and Saved Unitary Development Plan Policy DC26) which provides details of the existing noise levels in the area including levels during daytime, night time and weekends along with an indication of noise levels that you propose to achieve within the accommodation and details of the acoustic glazing and acoustically treated ventilation you propose to use and what measures will need to be implemented on site to meet internal noise requirements. In terms of the proposed uses, the study should identify the acoustic treatment and measures that will limit the breakout of noise in accordance with a noise study of the premises. The scheme proposed shall include measures such as acoustic lobbies at access and egress points of the premises, acoustic treatment of the building structure, sound limiters linked to sound amplification equipment, and specified maximum internal noise levels.

- 1.3 This report provides details of the existing baseline noise levels in the area, the predicted noise levels from the proposed use and assessment of the potential noise impact at nearby noise sensitive receptors as required by the Local Authority as part of the planning application.
- 1.4 Acoustic terminology is discussed in brief in Appendix A.

2.0 BACKGROUND AND SITE DESCRIPTION

- 2.1 The site is a former ground floor retail unit located at 95 Oxford Street, Manchester, which runs along the south-western boundary of the site. The proposed unit is bound to the south-east by the Palace Theatre and to the north-west by a fast-food takeaway with an internal seating area. The nearest noise sensitive properties are the existing offices directly above the unit, which are open from 0800 – 1800h, Monday to Friday and residential apartments approximately 20m away on the opposite side of Oxford Street.
- 2.2 The proposed unit is understood to operate from 1000h to 0200h, 7 days a week.
- 2.3 A location plan showing the site and the nearest noise sensitive properties is provided in Figure 2.1, below.

Figure 2.1 – Proposed Site Location



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- 2.4 It is understood that the proposals also include provision for new mechanical plant associated with the development which is to be installed above the entrance on the façade of the building facing Oxford Street and will operate during the same hours as the premises.
- 2.5 At this stage, it is understood that the site will allow for the provision of internal low-level background music and this assessment includes for this.

3.0 BASIS OF ASSESSMENT

National Planning Policy Framework

- 3.1 Current national planning policies are set out in the National Planning Policy Framework (NPPF) published by the Department for Communities and Local Government in March 2012. The planning policies relating specifically to noise were updated in July 2021 in paragraphs 174, 185 and 187 which state:

'174. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- a) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.*

185. 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:

- a) 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,*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;'*

187. 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 implemented.'

Internal Noise Levels - Residential

- 3.2 Manchester City Council (MCC) has outlined their requirements for noise assessments to accompany planning applications in *'Planning & Noise – Technical Guidance'* (2022) (PNTG).

- 3.3 Section 3.7.1.1 of this document states “*The Council has adopted the following noise limits for residential properties:*
- *Bedroom (night-time – 23.00 – 07.00) 30dB_{L_{Aeq}} (individual noise events should not normally exceed 45dB_{L_{Amax,F}} by more than 15 times);*
 - *Living Rooms (daytime – 07.00 – 23.00) 35dB_{L_{Aeq}}.”*
- 3.4 These levels are based on guidance presented in BS8233 and The Association of Noise Consultants (ANC) document Professional Practice Guidance (ProPG) on Planning and Noise ‘New Residential Development’ (2017).
- 3.5 ProPG states that the external to internal attenuation provided by a window partially open for ventilation purposes is no more than -15dB.
- 3.6 Assuming that these apartments utilise this method of ventilation, the internal noise level criteria presented above must, therefore, not be exceeded when windows are open. As such, by allowing for 15dB of attenuation provided by an open window, the external noise levels presented in Table 3.1 should not be exceeded.

**Table 3.1 – Allowable External Free-field Noise Levels for Whole Dwelling (Background)
Ventilation via a Partially Opened Window**

Activity	Location	Noise Level Limit, dB		
		Daytime 0700 – 2300h L _{Aeq,16h}	Night-Time 2300 – 0700h	
			L _{Aeq,8h}	L _{Amax,F}
Resting	Living Room	50	-	-
Dining	Dining Room/Area	55	-	-
Sleeping (daytime resting)	Bedroom	50	45	60

Internal Noise Levels - Offices

- 3.7 With respect to noise levels within the offices above the proposed premises, Table 6 of BS8233 provides suggested internal design ranges for non-domestic buildings. These are reproduced in Table 3.2, below.

Table 3.2 – Indoor Ambient Noise Levels in Spaces When They Are Unoccupied

Activity	Location	Design range L _{Aeq,T} dB
Study and work requiring concentration	Staff/meeting room, training room	35-45
	Executive office	35-40

- 3.8 It is assumed that ventilation is provided to the offices via openable windows. Therefore, by allowing for -15dB of attenuation, provided via an openable window would mean that in order to meet the criteria in Table 3.2, above, external noise levels outside the offices should not exceed 50dB_{L_{Aeq,T}}.

Atmospheric Plant Noise Emissions

- 3.9 The Manchester City Council Planning & Noise Guidance provides the following in relation to noise level limits for mechanical plant.

“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_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

4.0 EXISTING NOISE CLIMATE

- 4.1 A baseline noise survey was previously undertaken by AEC as part of the planning application for the serviced apartments at 36-38 Oxford Street (ref: P4051/R1a/RDC), approximately 120m to the north-west of the proposed development.
- 4.2 Unattended noise measurements were undertaken on the roof of the building, overlooking Oxford Street between 1400h on Friday 27 May 2022 until 1000h on Monday 30 May 2022, shown as Location A on the following Figure 4.1.

Figure 4.1 – Noise Measurement Location



Imagery @2022 Google, Imagery @2022 Infoterra Ltd & Bluesky, Maxar Technologies, The Geoinformation Group, Map Data @2022

- 4.4 All measurements were undertaken in general accordance with BS7445-1: 2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'.
- 4.5 It is considered that the measured noise levels are representative of the noise climate of the general area. A summary of the daytime (1000-2300h) and night-time (2300-0200h) ambient and background noise levels during the proposed operating hours of the mechanical plant associated with the development is presented in Table 4.1, below.
- 4.6 During the survey, the dominant noise source was observed to be road traffic on Oxford Street.
- 4.7 Details of the noise survey are provided in Appendix B.

Table 4.1 – Summary of Measured Free-field Noise Levels

Date	Noise Level, dB			
	Daytime (1000-2300h)		Night-Time (2300-0200h)	
	Ambient $L_{Aeq,T}$	Background $L_{A90,T}$	Ambient $L_{Aeq,T}$	Background $L_{A90,T}$
Friday 27 May 2022*	72	62	70	63
Saturday 28 May 2022	72	63	72	64
Sunday 29 May 2022	67	58	65	57

*Measurements start from 1315h.

- 4.8 Based on the above survey, the lowest background noise level for the offices would be $62\text{dB}L_{A90,T}$, as this is during the weekday. For the residential, the lowest background noise level is $57\text{dB}L_{A90,T}$, during the night-time period.

5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

Noise Breakout from Premises

- 5.2 Noise breakout calculations have been carried out to determine the noise emitted from the site and impacting the offices above the site and the Manchester Apartments. These calculations are based on a typical frequency spectrum for a moderately busy city centre bar with background music and the construction of the front façade of the premises. As this is representative of a bar atmosphere, this is considered a worst-case assessment.
- 5.3 Based on the drawings provided, it has been assumed that the front façade of the building will be double glazed. A -3dB correction has been applied to the sound reduction performance of the glazing to account for its on-site performance.
- 5.4 The following Table 5.1 shows the source noise levels, sound reduction performance provided by the glazing and the predicted noise level at the nearest noise sensitive properties.

Table 5.1 – Predicted Noise Levels at Nearest Noise Sensitive Properties

Description	Noise Level, dB L _{eq} at Octave Band Centre Frequency, Hz							dBL _{Aeq}
	63	125	250	500	1k	2k	4k	
Source (Internal Noise Level)	79	73	71	67	70	70	67	75
Sound Reduction Index (Front Facade) - Glazing	12	18	14	22	32	34	28	--
Calculated Noise Level (Offices Above)	57	45	47	35	27	26	28	41
Calculated Noise Level (Manchester Apartments)	40	28	31	18	11	9	12	24

- 5.5 As previously stated, external noise levels should be controlled to not exceed 45dBL_{Aeq,8h} at night outside the apartments and 50dBL_{Aeq,16h} during daytime hours at the offices (and apartments), to ensure that appropriate internal noise level limits are not exceeded.
- 5.6 Based on Table 5.1, these criteria would be met and the internal noise level limits would not be exceeded.

Noise Transfer from Premises to Offices Above

- 5.7 In order to determine the noise emitted via the floor structure to the offices above, a sound insulation test was carried out by AEC on the existing floor between these spaces. The measured on-site performance of the floor was 54dB_{Dw}. The floor construction was unknown and there were no obvious flanking paths other than via the floor structure itself.
- 5.8 Table 5.2, below, shows the predicted noise levels in the offices above based on the assumed source noise levels and measured performance of the separating floor.

Table 5.2 – Predicted Noise Levels in Offices Above

Description	Noise Level, dB L _{eq} at Octave Band Centre Frequency, Hz							dBL _{Aeq}
	63	125	250	500	1k	2k	4k	
Source (Internal Noise Level)	79	73	71	67	70	70	67	75
Measured Floor Performance	35	39	47	55	54	53	61	--
Calculated Noise Level (Offices Above)	44	34	24	12	16	17	6	24

- 5.9 The calculations demonstrate that the existing separating floor between the ground and first floors would control the transmission of noise to achieve the BS8233 suggested internal design ranges for non-domestic buildings.

Mechanical Services Noise

- 5.10 As previously stated, all of the items of plant will be located internally but will have a single extract on to Oxford Street. Based on the layout of the drawings, it is understood that the only significant noise generating item of plant is the Extract Fan. Its model is a Flakt Woods Estoc Targe 67-450-1.
- 5.11 Based on manufacturer data, this item of plant has a sound pressure level at 3m of 44dB(A).
- 5.12 Based on the representative background noise levels, provided in Table 4.1 above, the lowest background noise level for the offices and residential is 62dBL_{A90,T} and 57dBL_{A90,T}, respectively.
- 5.13 Therefore, in order to meet Manchester City Council's noise level limits, noise from any mechanical services plant should be controlled such that the rating level does not exceed 57dBL_{Ar,Tr} external to the offices above during the daytime period (Mon-Fri), and 52dBL_{Ar,Tr} for the night-time period at the residential (up to 0200h). Meeting this level during the daytime at the residential receptors would also ensure that the daytime criteria is met.
- 5.14 As the kitchen extract is already below these figures internally, the noise emitted externally should be lower and, therefore, the requirements should be inherently achieved and the noise level limits not exceeded.

APPENDIX A – Acoustic Terminology in Brief

Sound Description

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human ear is sensitive to sounds from about 20 Hertz to 20,000 Hertz. Although sound can be of one discrete frequency - a 'pure tone' - most sound is made up of many different frequencies.

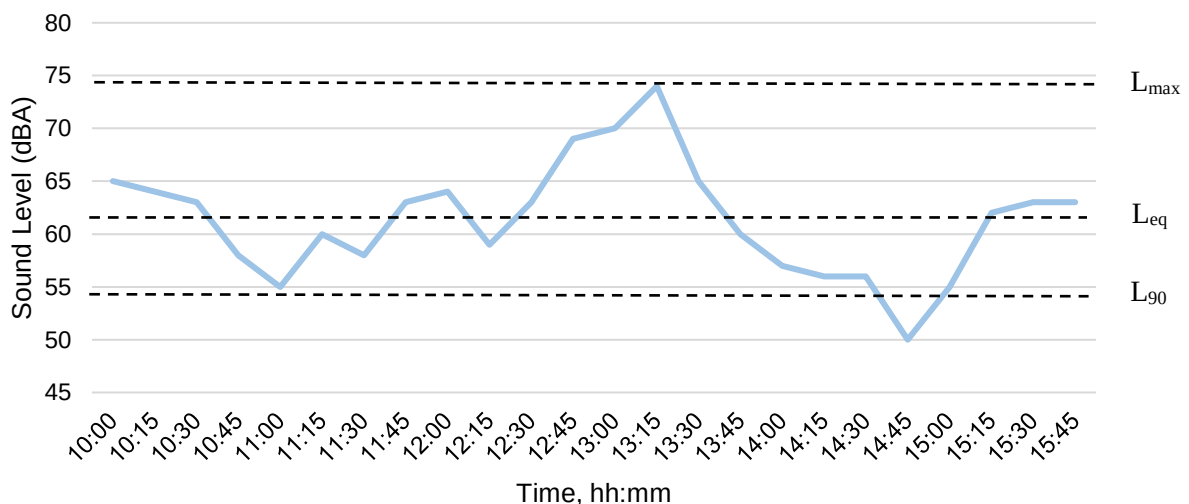
The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The *dBA* weighting emphasises or reduces the importance of certain frequencies within the audible range.

Sound Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as fifteen minutes or one hour, the statistically determined results being used to quantify various aspects of the sound.

The figure below shows an example of sound level varying with time. Because of this time variation, the same period of sound can be described by several different levels. The most common of these are described below. It should be noted that in many instances in the main body of text, the unit will be preceded by a dB descriptor in the report e.g. $L_{Aeq,T}$ could be written $dBL_{Aeq,T}$.

Example of Sound Varying with Time



Unit Type	Acoustic Unit	Description
Ambient Sound Level	$L_{Aeq, T}$	The equivalent continuous (A-weighted) sound level. It may be thought of as the “average” sound level over a given time, T. It is used for assessing noise from various sources: industrial and commercial premises, construction sites, railways and other intermittent noises and can be considered as the “ambient” noise level.
Background Sound Level	L_{A90}	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe background noise.
Free-field Level	-	This refers to the sound level measured outside, away from reflecting surfaces.
Rating Level	$L_{Ar, Tr}$	Specific sound level plus any adjustment for the characteristic features of the sound

APPENDIX B – Environmental Measurement Procedure – 2022 Noise Level Survey

Date & Time of Survey:	1315h, Friday 27 May 2022 to 1000h on Monday 30 May 2022.					
Personnel:	Ross Chamberlain & Naveen Ramesh Simha (AEC).					
Equipment Used:	Cirrus CR:171B Real Time Analyser (AEC Kit 3).					
Calibration:	The sound level analysers, which conform to BS EN 61672-1: 2003 <i>‘Electro acoustics – sound level meters - Part 1 Specifications’</i> for Class 1 Type Z meters, was in calibration and check calibrated before and after the measurement periods using a Brüel & Kjær type 4231 (94dB) calibrator. There was no significant drift of calibration. Calibration certificates are available on request.					
Weather Conditions:	Date	Period	Wet/Dry	Temp°C	Wind Speed & Direction	Cloud Cover
	27.05.22	Day	Dry	13°C	Easterly 10mph	40%
	27.05.22 – 28.05.22	Night		10°C	Easterly 9mph	10%
	28.05.22	Day		14°C	Southerly 5mph	30%
	28.05.22 – 29.05.22	Night		10°C	Southerly 4mph	50%
	29.05.22	Day		11°C	Westerly 8mph	40%
	29.05.22 – 30.05.22	Night		9°C	Easterly 3mph	20%
	30.05.22	Day		9°C	Easterly 5mph	50%
Measurement Locations:	Measurements were undertaken at a single location on the rooftop overlooking Oxford Street. Identified as A on Figure 4.1 and described below.					
Measurement Details:	Measurements were undertaken over various periods in terms of L _{eq} , L ₁₀ , L ₉₀ , and L _{max} .					
Façade / Free-Field:	A – free-field measurements.					
Measured Data:	Full octave band centre frequency data was obtained for all measurements.					