



BRICTORIAN LTD

342 SLADE LANE, MANCHESTER

NOISE ASSESSMENT FOR PLANNING PURPOSES

29 June 2022

AEC REPORT: P4652/R1/NRS

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1.0 INTRODUCTION

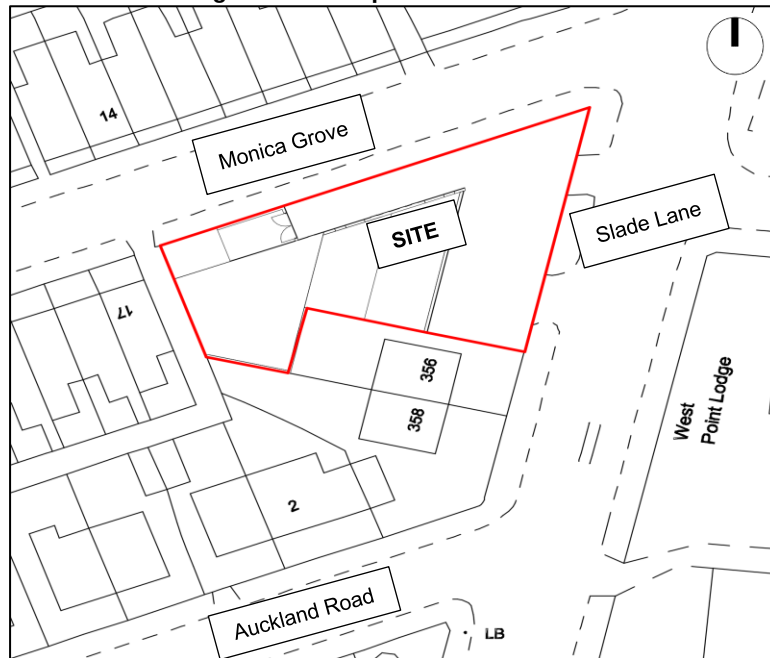
- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Brictorian Ltd to undertake a noise assessment in relation to the proposed conversion of vehicle storage unit into a garage at 342 Slade Lane, Manchester.
- 1.2 This report details the baseline noise levels measured around the development site and provides an assessment of the potential noise impact of the proposed development on the nearest noise sensitive receptors taking into account relevant guidance and Local Authority requirements.
- 1.3 Acoustic terminology is discussed in brief in Appendix A.

2.0 BACKGROUND AND SITE DESCRIPTION

Site Location

- 2.1 The proposed development is bound by Monica Grove to the north, Slade Lane to the east and residential properties to the south and west, as identified in the site location plan presented in Figure 2.1, below.

Figure 2.1 – Proposed Site Location



Proposed Scheme

- 2.2 The site is currently used for vehicle storage and minor vehicle repairs only. The proposed scheme is to use the site as a full-scale vehicle repair garage including MOT testing.
- 2.3 It is understood that the garage will be operational from 0900 to 1700h, Monday to Friday.
- 2.4 Based on the floor layout presented on the drawings provided to AEC, the proposed garage will consist of vehicle repair area and an office area, as indicated in Figure 2.2, below.
- 2.5 It is understood that the vehicle repair area will have two rolling shutters to the east, facing Slade Lane.

Figure 2.2 – Proposed Floor Plan



- 2.6 The nearest noise sensitive receptors (NNSR's) to the garage will be 356 Slade Lane and West Point Lodge (249 Slade Lane), to the south and east of the scheme, respectively.. It should be noted that the front elevation of 356 Slade Lane is offset by around 4m from the front elevation of the garage.
- 2.7 AEC understands that all activities will be located inside the building. It is understood that there are no proposed changes to the building envelope at this stage.
- 2.8 There is no mechanical services plant associated with the development and hence this is not considered further in the assessment.

3.0 NOISE CLIMATE

- 3.1 An attended noise level survey was undertaken by AEC at a single location, identified as A on the attached Figure B.1, on Monday 20 June 2022, between approximately 1630 and 1800h. A full measurement procedure for the survey is presented in Table B.1 and the measured data is presented in Table B.2.
- 3.2 All measurements were undertaken under free-field conditions and in general accordance with BS7445-1: 2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*' (BS7445-1) and BS4142:2014+A1 (2019) '*Methods for rating and assessing industrial and commercial sound*' (BS4142).
- 3.3 The typical free-field ambient (L_{Aeq}) and background (L_{A90}) noise levels measured at Location A, external to the NNSR, was about 65dB $L_{Aeq,T}$ and 48dB $L_{A90,T}$, respectively.
- 3.4 The noise climate was dominated by road traffic on Slade Lane and it should be noted that there was little or no noise from the existing vehicle storage area contributing to the measured noise levels.

4.0 BASIS OF ASSESSMENT

- 4.1 Manchester City Council's (MCC's) document Planning & Noise – Technical Guidance issued in June 2022 (PNTG) states the following in relation to assessing the impact of industrial / commercial noise on noise sensitive receptors.

'The development should be 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.

In addition to the above, maximum noise levels should also be adequately controlled. Where particular uses generate high noise levels of a short duration (e.g. loud bangs) on a regular basis, these should aim to be controlled so as not to exceed 60dB (L_{Amax}) at the façade of noise sensitive premises nearby in accordance with the recommendations of the WHO (section 3.6).'

- 4.2 The term 'rating level' is defined in BS4142 paragraph 9.1, which states:

"Certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:

- a) Subjective method;*
- b) Objective method for tonality;*
- c) Reference Method."*

- 4.3 Based on the on-site observations this assessment has been undertaken in accordance with the subjective method only and this method is summarised below.

- 4.4 The subjective method is based on an on-site assessment of the specific sound, in terms of the prominence of a specific tone or impulse or other character in the sound. A correction is applied based on the perception of the tonality and/or impulsivity (or other character) of the specific sound in comparison to residual sound at the nearest noise sensitive receptor, the corrections to be applied are presented in Table 4.1, below.

**Table 4.1 – Perceptibility of Tonality and/or Impulsivity of Specific Sound
Against Residual Sound**

Perceptibility	Tonality	Impulsivity
None	0	0
Just	+2	+3
Clearly	+4	+6
Highly	+6	+9

- 4.5 The rating level is determined by applying the appropriate correction, if any, to the specific sound level.
- 4.6 The significance of the potential impact is indicated by the difference between the background sound level and the rating level. Typically, the greater this difference, the greater the magnitude of the impact:
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
 - 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.
 - 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.

5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

- 5.1 AEC has undertaken numerous noise assessments of MOT garages and the noise exposure of mechanics. There are several noisy activities that occur intermittently, such as: use of pneumatic tools to remove wheel nuts; use of grinders; hammering, engine revving etc. However, these activities are typically very short in duration and there are longer periods when quieter hand tools are used.
- 5.2 Based on AEC's experience ambient noise levels in the garage would typically be around 72dBL_{Aeq,1h} with maximum noise levels typically no greater than 80dBL_{Amax,F}. These noise levels have used in the assessment below.
- 5.3 Based on the drawings issued by Create It Studios, the proposed sound insulation performance and area of the external envelope elements of the garage are presented in Table 5.1, below. It should be noted that based on AEC's experience the roller shutter doors will be open at all times that the garage will be in use. Therefore, the assessment of noise breaking out to the front of 356 Slade Lane and West Point Lodge have been based on the roller shutter doors being open.

Table 5.1 – Building Elements and their Sound Reduction Performance

Elevation	Element	Sound Reduction Performance R_w (dB)	Area, m ²
Eastern	Roller Shutters	17 (0 when open)	14
Southern	Masonry	40	50
Roof	Metal Deck	24	300

- 5.4 Based on the typical ambient noise level in the garage, the building element details in Table 5.1, distance attenuation and any applicable screening, calculated specific noise level and rating level external to the front and rear of 356 Slade Lane and external to the western façade of West Point Lodge are provided in Table 5.2, below.
- 5.5 Considering the noise from the garage will be intermittent from the ambient noise climate, a +3dB character correction would be appropriate

Table 5.2: Specific and Rating Level External to the NNSR's

Description	NNSR		
	356 Slade Lane (Front)	356 Slade Lane (Rear)	West Point Lodge (western façade)
Specific noise level (dBL _{Aeq,T_r})	43	35	41
Character Correction	+3	+3	+3
Rating Level (dBL _{Ar,T_r})	46	38	44
Background (dBL _{A90})	48	48	48
Excess Over Background	-2	-10	-4

- 5.6 Comparing these rating levels provided in Table 5.2 with MCC's requirement of $43\text{dBL}_{\text{Ar,Tr}}$, (typical measured background noise level minus 5dB), indicates that the criteria is met to the rear of 356 Slade Lane and that the noise from the garage will have no impact at this location.
- 5.7 With respect to the front of 356 Slade Lane and West Point Lodge, the rating level is marginally above MCC's criteria. However the rating level external to both these locations is still below the measured background noise level as shown in Table 5.2.
- 5.8 It should be noted that the unit is currently used for the storage and maintenance of vehicles and BS4142 does indicate that where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact and hence can be deemed acceptable.
- 5.9 In addition, based on the typical maximum noise level in the garage, building element details in Table 5.1, distance attenuation and any applicable screening, calculations indicate that the maximum noise level external to all three NNSR locations would not exceed $60\text{dBL}_{\text{Amax,F}}$ and hence comply with MCC's criteria.
- 5.10 Therefore, noise should not be considered a determining factor in relation to any planning permission being sought.

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.

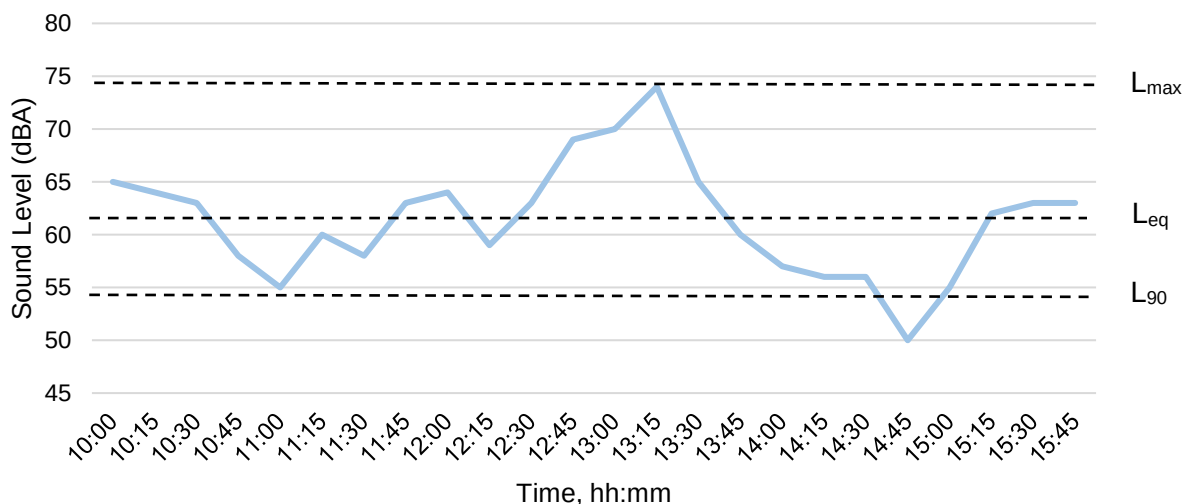
The human ear is more sensitive to some frequencies than others, and modern instruments can measure sound in the same subjective way. This is the basis of the A-weighted sound pressure level *dBA*, normally used to assess the effect of noise on people. The *dBA* weighting emphasises or reduces the importance 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
Standard Acoustic Units		
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.
Percentile Level	L_{A1}	The (A-weighted) sound level exceeded for 1% of a measurement period. It is the value generally used to indicate a ‘typical’ maximum noise level.
	L_{A10}	The (A-weighted) sound level exceeded for 10% of a measurement period. It is the value often used to describe traffic noise.
	L_{A90}	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe background noise.
Maximum Sound level	L_{Amax}	The maximum (A-weighted) sound level measured during a given time. ‘Fast’ or ‘Slow’ meter response should be cited.
Additional Acoustic Units		
Free-field Level	-	This refers to the sound level measured outside, away from reflecting surfaces.
Façade Level	-	This refers to the sound level measured outside, at 1m from a hard-reflecting surface, typically 3dB greater than the free-field level.
Sound reduction index	R_w	Single number rating used to describe the <u>laboratory</u> airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
Apparent sound reduction index	R'_w	Single number rating used to describe the sound reduction index of an on-site construction over a range of frequencies, typically 100-3150Hz.
BS 4142:2014+A1:2019 Additional Acoustic Units		
Ambient Sound Level	$L_{Aeq, T}$	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T.
Background Sound Level	L_{A90}	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels.
Rating Level	$L_{Ar, Tr}$	Specific sound level plus any adjustment for the characteristic features of the sound
Residual Sound	$L_{Aeq, T}$	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Specific Sound Level	$L_{Aeq, Tr}$	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, r.

APPENDIX B – Noise Survey Details

FIGURE B.1 – Existing Site Showing Monitoring Locations



TABLE B.1 – Measurement Procedure

Date & Time of Survey:	Monday 20 June 2022, 1630 to 1800h.					
Personnel:	Naveen Ramesh Simha (AEC).					
Equipment Used:	Cirrus CR:171B Real Time Analyser (AEC Kit 5).					
Calibration:	The sound level analyser, which conforms to BS EN 61672-1: 2013 ' <i>Electroacoustics – 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
	20/06/2022	Day	Dry	17°C	North-westerly and 2 m/s	30%
Measurement Locations:	Measurements were undertaken at a single location around the development site. Identified as A on Figure 1 and described below. A – 2m from nearest carriageway of Slade Lane.					
Measurement Details:	Measurements were undertaken over various periods in terms of L_{eq} , L_{90} , and L_{max} .					
Façade / Free-Field:	A - free-field.					
	Full results for the attended measurements are given in Table B1.					
Measured Data:	Full octave band centre frequency data was obtained for all measurements.					

TABLE B.2 – Measured Daytime Noise Levels

Location	Period, h	Noise Level, dB				Comments
		L_{Aeq}	L_{A10}	L_{A90}	$L_{Amax, F}$	
A	1630 – 1645	64.7	69.4	47.4	76.2	Ambient and background noise climate due to road traffic on Slade Lane and maximum noise level due to bus pass by on Slade Lane.
	1702 – 1717	65.2	69.2	48.2	80.9	
	1734 – 1749	64.9	68.8	47.4	80.0	