



UNIT 2 STAKEHILL LANE

MIDDLETON, MANCHESTER

NOISE ASSESSMENT

09 September 2022

AEC REPORT: P4715/R1/WJK

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1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been appointed by Avison Young to undertake a noise assessment of the proposed change of use from former call centre (Class E(g)) to general warehouse unit / general industrial (Class B8/B2) at the premises at Unit 2, Stakehill Lane, Middleton.
- 1.2 This report presents details of the noise survey that has been undertaken to determine the existing noise climate at the nearest noise sensitive properties and provides an assessment of the potential noise impact from the proposed use of the premises against relevant standards and criteria. Where appropriate, outline mitigation measures have been identified to achieve acceptable noise levels at noise sensitive properties.
- 1.3 Acoustic terminology used throughout this report is described in brief in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 The premises is a single-storey former call centre located on the north east boundary of a large industrial estate. At this stage the occupiers and operational hours of the premises have not been determined.
- 2.2 The nearest noise sensitive properties are on Stakehill Lane, approximately 25m to the north-east of the premises.
- 2.3 A plan showing the site and location of the nearest residential receivers is provided on Figure 2.1 below.

Figure 2.1 – Site Location Plan



3.0 EXISTING NOISE CLIMATE

- 3.1 An unattended baseline noise survey was undertaken by AEC from 1230h to 2245h on Monday 5 September 2022. Attended baseline noise measurements were carried out from 2300h on Tuesday 6 September to 0100h on Wednesday 7 September 2022 at locations representative of the nearest noise sensitive properties on Stakehill Lane, identified as D (Daytime) and N (Night-time) on Figure 2.1.
- 3.2 During the daytime period, the dominant noise source was observed to be occasional local road traffic on Stakehill Lane. During the night-time period, the dominant noise sources were observed to be local and distant road traffic on the A627(M), aircraft and occasional noise from the industrial estate.
- 3.3 All measurements were undertaken in general accordance with BS7445-1: 2003 '*Description and measurement of environmental noise. Guide to quantities and procedures*'. A full measurement procedure is presented in Appendix B and the measured data is presented in Graph B1 and Table B1.
- 3.4 A summary of the noise levels measured during the day and night-time periods is presented in the following Table 3.1.

Table 3.1 – Measured Noise Levels

Location	Date	Period	Noise Level	
			dBL _{A90,T}	dBL _{Aeq,T}
D	Monday 5 September 2022	Daytime	44	54
N	Tuesday 6 - Wednesday 7 September 2022	Night-time	41	49

- 3.5 The average background noise levels over the daytime and night-time periods were 44dBL_{A90,T} and 41dBL_{A90,T}, respectively.
- 3.6 The standard BS4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' states that a representative background noise level should be used and that the objective is not just to ascertain a lowest background sound level. Therefore, for the purposes of this assessment, the average measured background noise levels for the daytime and night-time periods have been used.

4.0 ASSESSMENT METHODOLOGY

National Planning Policy Framework

- 4.1 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.'

- 4.2 The terms '*significant adverse*' and '*adverse*' above are referenced to the Noise Policy Statement for England (NPSE), published by Department for Environment, Food and Rural Affairs (DEFRA) dated March 2010. One of the main aims of this policy is also to avoid significant adverse effects on health and quality of life.

- 4.3 Further to the above, the Governments '*Planning Practice Guidance*' relating to noise (web based) dated 6 March 2014 indicates:

'Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.'

- 4.4 In addition, the guidance indicates that, whilst noise can override other planning concerns, it should not be considered in isolation from the economic, social and other environmental dimensions of any proposed development.

BS4142: 2014+A1:2019

- 4.5 BS4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' provides methods for rating and assessing industrial and commercial sound by comparing the specific sound level (that directly attributable to the industrial/commercial sound) to the prevailing background sound level ($dBL_{A90,T}$) over relevant periods that the commercial/industrial activities occur.
- 4.6 It is necessary to determine the specific sound level from the industrial/commercial activities over a period of one hour during the daytime and/or 15 minutes during the night-time. The specific sound level relates to the specific commercial/industrial sound source only and has to be corrected to take account of other sound sources generally in the area, residual sound. Daytime is normally considered to be over the period 0700 to 2300 hours, and night-time 2300 to 0700 hours.
- 4.7 Section 9 identifies that 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 present at the assessment location, such features are taken into account by adding a correction to the specific sound level to obtain the rating level. A correction should be applied if one or more of the following features occur, or are expected to be present for new or modified sound sources:
- Tonality-* for sound ranging from not tonal to prominently tonal a correction of 0 to 6dB should be considered.
- Impulsivity-* A correction of up to 9dB can be applied for sound that is highly impulsive, considering both the rapidity and overall change in sound level.
- Other-* Where a sound features characteristics that are neither tonal nor impulsive but are readily distinctive against the residual environment a penalty of 3dB can be applied.
- Intermittency-* If intermittency is distinctive against the residual environment a penalty of 3dB can be applied.
- 4.8 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.
- 4.9 With regard to undertaking the assessment, BS4142 indicates that the context of the sound must be taken into consideration.

5.0 ASSESSMENT

- 5.1 For the purposes of this assessment, it is assumed that there would be no additional mechanical plant associated with the change of use. There are limited vehicle parking spaces around the existing premises and the closest car parking spaces are located around 150m to the west, access to which is via Whitbrook Way and Finlan Road to the west and south-west of the site. It is not anticipated that the change in use would result in a significant increase in road traffic from that already present as a result of other existing units on the industrial estate. Therefore, these elements have not been considered further in the assessment at this stage.

Noise Breakout from Units

- 5.2 At this stage the occupiers of the proposed units are unknown, however, for the purposes of the assessment, it is assumed that the premises could operate during the daytime and night-time periods. Noise break-out calculations have been carried out based on the build-up of the existing façade facing the nearest noise sensitive properties. The sound insulation performance of each element used in the calculations is provided in the following Table 5.1. A -3dB correction has been applied to each element to account for its onsite performance.

Table 5.1 – Building Element Sound Reduction Performance

Building Element	Sound Reduction Performance, dB @ Octave Band Centre Frequency (Hz)					
	125	250	500	1k	2k	4k
Insulated Cladding (Roof)	13	27	42	49	52	59
Twin Blockwork Wall	44	47	49	58	68	79
Glazing	19	14	21	34	38	35
Doors	18	24	29	31	33	33

Predicted Noise Levels

- 5.3 Based on the above sound reduction performances and the typical frequency spectrum for light industrial processes previously measured by AEC, calculations indicate that an internal noise level of approximately 85dB_{L_{Aeq,1hour}} would result in a noise level not exceeding the background noise level at the nearest noise sensitive properties for the daytime period (0700-2300h) and an internal noise level of approximately 81dB_{L_{Aeq,15mins}} would result in a noise level not exceeding the background noise level at the nearest noise sensitive properties for the night-time period (2300-0700h) as shown in the following Table 5.4.

Table 5.4 – Predicted Daytime Noise Levels at Noise Sensitive Properties

Period	Assumed Approximate Internal Noise Level (All Units Combined) dB _{L_{Aeq,T}}	Approximate Element Sound Reduction (dB)	Receiver Distance (m)	Predicted Noise Level at Receiver (dB _{L_{Aeq,T}})
Daytime	85	29	25	44
Night-time	81	29	25	41

- 5.4 Based on previously measured noise levels by AEC within premises for light industrial use including welding, drilling, sawing, punching, etc, typical internal reverberant noise levels ranged from around 75-80dB_{L_{Aeq,1hour}}. Slightly higher internal noise levels could be permissible depending on the frequency content of the sound.

BS4142 Rating Level

- 5.5 Based on the above calculations, the internal noise levels would result in an indication of a low impact depending on the context for the operation of the units for the daytime and night-time periods in accordance with BS4142. The source noise levels should be sufficient to allow for most processes associated with light industrial use.

BS4142 Sound Character Penalty

- 5.6 If it is considered that the noise from potential operations from the unit features characteristics that could be distinctive against the residual environment, the internal noise levels may need to be reduced by the penalty applied.
- 5.7 BS4142 indicates that the context of the sound must be taken into consideration. The premises are situated on a site with a number of existing commercial and industrial units. Therefore, it can be considered that the potential noise associated with the change of use of the premises would not be out of character for this location.
- 5.8 In terms of assessment uncertainty, there are small tolerances relating to the existing background noise measurements. The sound reduction performance of the building envelope is considered to be conservative.

6.0 SUMMARY & CONCLUSIONS

- 6.1 AEC has undertaken an assessment in relation to the potential noise impact from the conversion proposed change of use from former call centre (Class E(g)) to general warehouse unit / general industrial (Class B8/B2) at the premises at Unit 2, Stakehill Lane, Middleton.
- 6.2 Background noise surveys were undertaken by AEC from 1230h to 2245h on Monday 5 September 2022 and from 2300h on Tuesday 6 September to 0100h on Wednesday 7 September 2022 at locations representative of the nearest noise sensitive properties on Stakehill Lane.
- 6.3 A BS4142:2014 assessment has been carried out to assess the noise impact of activities associated with the potential future use of the premises. An indicative internal noise level limit has been specified for the unit that would result in a low impact at the nearest noise sensitive properties in accordance with BS4142. The noise level limit would be suitable for most processes associated with light industrial use.
- 6.4 With regard to undertaking the assessment, BS4142 indicates that the context of the sound must be taken into consideration. The existing premises are situated on a site with a number of other commercial and industrial units. Therefore, it can be considered that the potential noise associated with the change of use of the premises would not be out of character for this location.

APPENDIX A - Acoustic Terminology in Brief

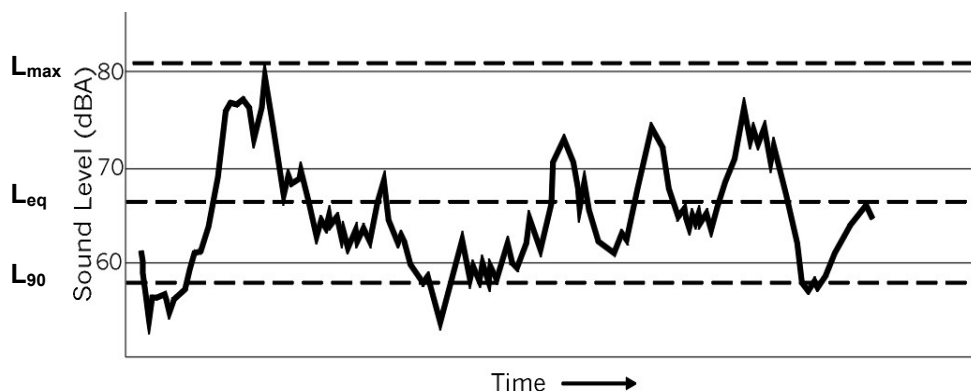
Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air. The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (*Hz*), that is, cycles per second. The human 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 noise 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.

Noise 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 noise.

The figure below shows an example of sound level varying with time. Because of this time variation the same period of noise can be described by several different levels. The most common of these are described below.



Example of Sound Level Varying With Time

- $L_{Aeq,T}$** The equivalent continuous (A-weighted) sound level. 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.
- L_{A90}** The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value used to describe the “background” noise.
- L_{Amax}** The maximum (A-weighted) sound level during a measurement period.
- Free-field Level** This refers to the sound level measured outside, away from reflecting surfaces.
- L_{AE}** The A-weighted sound exposure level is the equivalent noise level of an event as if the event was of one-second duration and allows the overall average, L_{Aeq} , level to be determined over different time periods for a number of events. L_{AE} is a mathematical unit which cannot easily be described in terms of perception.
- R_w** Single number rating used to describe the airborne sound insulation properties of a material or building element over the frequency range of typically 100-3150Hz.

APPENDIX B – Noise Survey Details

Date & Time of Survey:	Unattended: 1230h to 2245h, Monday 5 September 2022. Attended: Tuesday 6 September, 2300h to 0100h, Wednesday 7 September 2022.					
Personnel:	Warren King (AEC).					
Equipment Used:	Attended & Unattended: Cirrus CR:171B Real Time Analyser (AEC Kit 3).					
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	Avg Temp°C	Wind Direction	Cloud Cover
	05/09/2022	Day	Dry	20°C	South-westerly / Southerly	10%
	06/09/2022 to 07/09/2022	Night	Dry	14°C	Easterly	90%
Measurement Locations:	Measurements were undertaken at two locations representative of the nearest noise sensitive properties and identified as D and N on Figure 2.1 and described below. D – 10m from the centre of Stakehill Lane on the north-east elevation of the existing premises at a height of 1.5m. N – 4m from the centre of Stakehill Lane.					
Measurement Details:	Measurements were undertaken over 15-minute periods in terms of and L_{eq} , L_{90} and L_{max} .					
Façade / Free-Field:	D & N – Free-field					
Measured Data:	Full results for the unattended and attended measurements are shown in Graph B1 and Table B1. Full octave band centre frequency data was obtained for all measurements.					

GRAPH B1 – Measured Daytime Noise Levels, Monday 5 September 2022

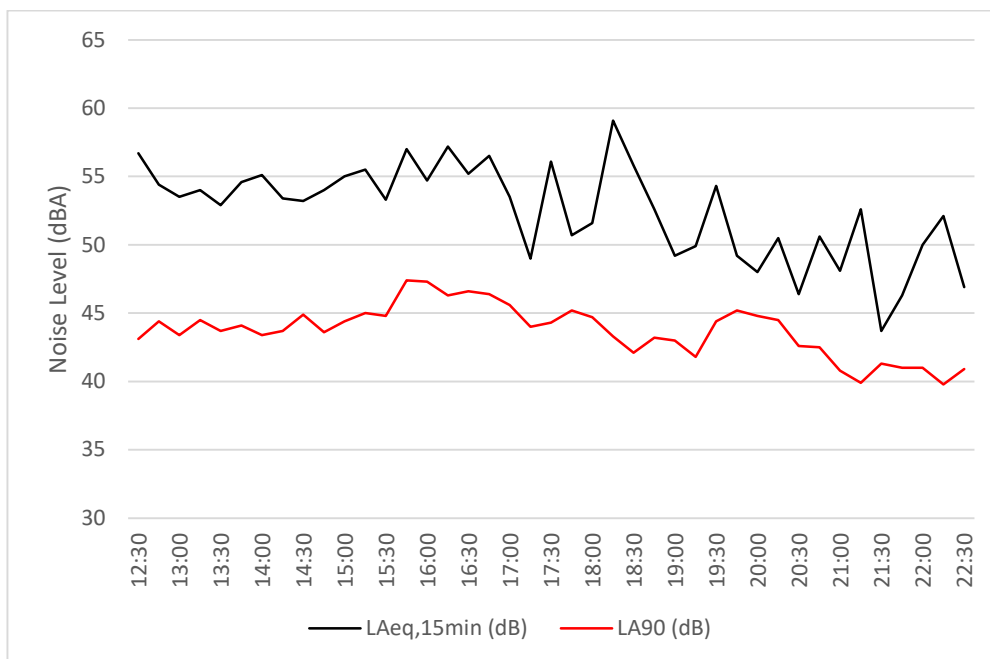


TABLE B1 – Measured Night-time Noise Levels, Tuesday 6 – Wednesday 7 September 2022

Start Time	Duration	Noise Level		Notes
		dBLA90	dBLAeq	
23:00	00:15:00	44.2	49.3	Occasional local road traffic and distant road traffic on A627(M), aircraft and occasional noise from activity on industrial estate.
23:15	00:15:00	42.7	46.9	
23:30	00:15:00	42.7	47.4	
23:45	00:15:00	42.2	46.2	
00:00	00:15:00	39.5	44.8	
00:15	00:15:00	40.0	44.5	
00:30	00:15:00	39.9	43.9	
00:45	00:15:00	39.2	55.3	