



TTS TRADING LTD

3-9 HYDE ROAD, MANCHESTER

NOISE ASSESSMENT FOR PLANNING PURPOSES

6 January 2023

AEC REPORT: P4659/R1a/NRS

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CONTENTS

	Page
1.0 INTRODUCTION	3
2.0 BACKGROUND AND SITE DESCRIPTION	3
3.0 NOISE MEASUREMENTS	5
4.0 BASIS OF ASSESSMENT	7
5.0 ASSESSMENT OF PROPOSED DEVELOPMENT	8
APPENDIX A – Acoustic Terminology in Brief	11
APPENDIX B – Noise Survey Details	13
TABLE B1 – Measurement Procedure	13
TABLE B2 – Measured Night-time Noise Levels	13

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1.0 INTRODUCTION

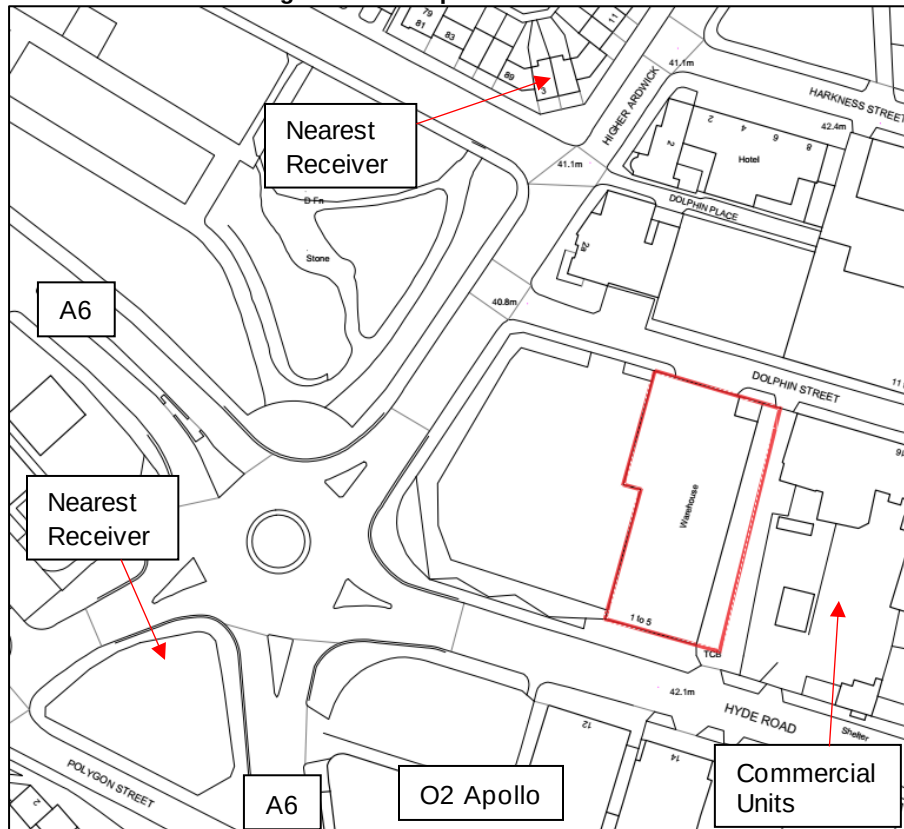
- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by TTS Trading Ltd to undertake a noise assessment in relation to the proposed conversion of the first-floor warehouse space at 3-9 Hyde Road, Manchester into a commercial unit.
- 1.2 This report details the baseline noise levels 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 Hyde Road to the south, Dolphin Street to the north, Higher Ardwick to the west and commercial units to the east as indicated in Figure 2.1, below.

Figure 2.1 – Proposed Site Location



- 2.2 Hyde Road joins the A6, which is a busy road connecting Manchester city centre and Stockport through the roundabout to the south-west of the site.
- 2.3 About 30m to the south of the site (opposite side of Hyde Road) is the O2 Apollo Concert Hall.
- 2.4 The commercial units to the east of the site includes an MOT garage, tyre shop and a fleet management company.

Proposed Scheme

- 2.5 The scheme involves the conversion of the first-floor warehouse space in a two-storey building at 3-9 Hyde Road, Manchester into a commercial unit comprising a snooker club and a dining area, as identified in Figure 2.2, below.

Figure 2.2 – Proposed Floor Plan



- 2.6 The ground floor area will remain occupied by offices and self-storage units which are understood to be operating during normal office hours between 0900 and 1700h.
- 2.7 It is understood that the proposed snooker club will be open from 1100 to 0500h, seven days a week.
- 2.8 It is also understood that only background music will be played in the snooker club and no live or amplified music events will be held. Therefore, noise from amplified music events is not considered further in this assessment.
- 2.9 The nearest noise sensitive receptors to the proposed scheme will be the residences about 100m to the south-west and north-west of the site on the A6 and Higher Ardwick, respectively.

3.0 NOISE MEASUREMENTS

Sound Insulation Measurements

- 3.1 The separating floor between the proposed first-floor snooker club and the ground floor office space is a concrete floor lined with a metal grid ceiling.
- 3.2 An airborne sound insulation test was undertaken on the separating floor between the proposed snooker club on the first floor and the offices on the ground floor on Friday 11 November 2022.
- 3.3 The measured performance is summarised below in Table 3.1. Details of all measured data and equipment calibration are held on file by AEC and can be made available on request.

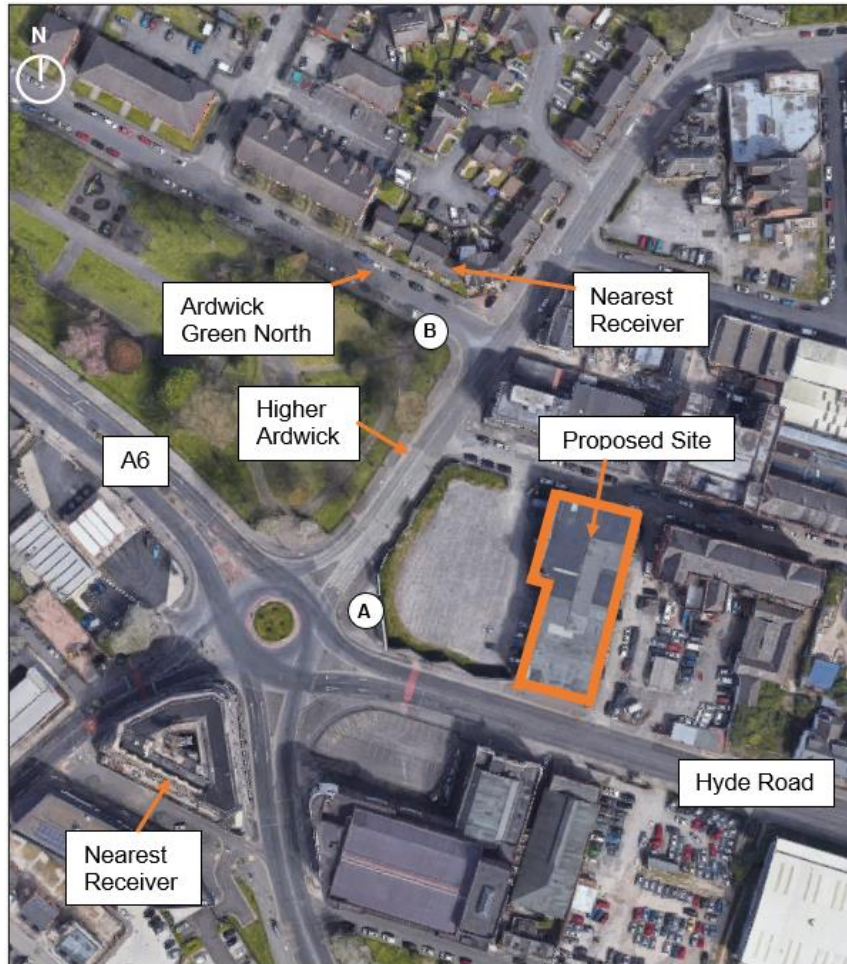
Table 3.1 – Summary of Sound Insulation Achieved By Separating Floor

Source Location	Receiving Room	Sound Level Difference, dB at Octave Band Centre Frequency, Hz							D _w (dB)
		63	125	250	500	1k	2k	4k	
First Floor Unit	Ground Floor Office	34	37	49	53	57	62	70	57

Background Noise Levels

- 3.4 An attended night-time noise level survey was undertaken by AEC on Sunday 13 November 2022 between approximately 0000h and 0130h. Measurements were undertaken at two locations external to residences on the A6 and Higher Ardwick, identified as A and B, respectively on Figure 3.1, below.
- 3.5 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*'. A full measurement procedure for the survey is presented in Table B1 of Appendix B and the measured data is presented in Table B2.

Figure 3.1 – Proposed Site Location Showing Monitoring Locations



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- 3.6 A summary of the measured night-time free-field ambient and background noise levels at each location is presented in Table 3.2, below.

Table 3.2 – Summary of Measured Free-field Noise Levels

Measurement Location	Noise Levels, dB	
	Ambient, $L_{Aeq,T}$	Background, $L_{A90,T}$
A	62	56
B	58	47

- 3.7 The spectrum data at each of the octave band centre frequencies of the free field background noise level at each location is presented in Table 3.3, below.

Table 3.3 – Night-time Background Noise Level (dBL_{A90,T}) at each of the Octave Centre Band Frequencies

Location	dBA	Octave Band Centre Frequencies, Hz						
		63	125	250	500	1k	2k	4k
A	56	56	53	53	50	53	49	36
B	47	53	48	43	39	44	40	28

- 3.8 The noise levels measured at locations A and B were due to road traffic on Hyde Road / A6 and Higher Ardwick, respectively.

4.0 BASIS OF ASSESSMENT

- 4.1 Following consultation with Lisa Jones, an Environmental Health Officer at Manchester City Council (MCC), it was agreed that the night-time background noise survey should be undertaken between either 0000 and 0200h or 0100 and 0300h on a Sunday or Monday which is considered to be the quietest time in the area.
- 4.2 MCC's '*Planning and Noise Technical Guidance - October 2022*' (PNTG) does not provide noise level limits to be achieved due to noise from a snooker club breaking out of the external envelope or into a noise sensitive receptor in the same building.
- 4.3 Based on BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*' (BS8233) and '*British Council for Offices – 2014 (BCO)*' guide, noise from external sources like traffic should be controlled to NR40-45Leq and NR40Leq, respectively for open plan offices. In this case as the source is a snooker club where noise is considered just perceptible but not intrusive, AEC suggests that the ambient and maximum noise level be controlled to NR35Leq inside the offices.
- 4.4 For noise break-out from the snooker club, AEC proposes that the ambient and maximum noise levels at the nearest noise sensitive receptors should be controlled to no greater than 5dB below the measured night-time background noise level.
- 4.5 MCC's document PNTG, states the following in relation to setting noise level limits for industrial sources, such as external services plant, at noise sensitive premises:

"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".

5.0 ASSESSMENT OF PROPOSED DEVELOPMENT

- 5.1 AEC have previously measured typical noise levels from a busy city centre restaurant with background music being played and would consider that it is likely that these noise levels will be similar in the proposed snooker club with dining area. The previously measured ambient and maximum noise levels presented in Table 5.1 along with the octave band frequencies have been used in the assessment below.

Table 5.1 – Ambient ($dBL_{Aeq,T}$) and Maximum (dBL_{Amax}) Noise Levels in a Busy City Centre Restaurant

Noise Levels	dBA	Octave Band Centre Frequencies, Hz						
		63	125	250	500	1k	2k	4k
Ambient Levels, ($dBL_{Aeq,T}$)	75	59	64	69	73	70	67	60
Maximum Levels, (dBL_{Amax})	86	66	71	75	81	82	80	74

Noise Transfer into Offices

- 5.2 In order to provide a robust assessment of the potential impact of the snooker club on the ground floor offices, calculations based on the airborne sound insulation performance of the separating floor presented in Table 3.1 and the maximum noise levels presented in Table 5.1, have been undertaken, and are provided in Table 5.2 below, along with a comparison with the suggested NR criteria.

Table 5.2 – Comparison of Noise Level in Offices due to Maximum Noise Level in the snooker club with NR35 L_{eq}

Item	dBA	Octave Band Centre Frequency's, Hz						
		63	125	250	500	1k	2k	4k
Maximum Noise Level, $L_{max,F}$	86	66	71	75	81	82	80	74
Sound Insulation of the separating floor to Offices, D_w	-	-34	-37	-49	-53	-57	-62	-70
Resultant Noise Level in the Offices, $L_{eq,T}$	29	32	34	26	28	25	18	4
NR35 Spectrum, L_{eq}	-	63	52	45	39	35	32	30
Difference	-	-31	-18	-19	-11	-10	-14	-26

- 5.3 As identified above, noise levels in the office from the snooker club above would be below the NR35 L_{eq} spectrum in each of the above octave centre band frequencies when both ambient and maximum noise levels are considered.

Noise Break-Out

- 5.4 In terms of noise break-out, the external envelope of the proposed snooker club is constructed from masonry columns with glazed windows in between.
- 5.5 The glazing on the northern, eastern and western façades of the proposed snooker club is understood to consist of double glazing (4mm glass/20mm thermal cavity/4mm glass), with an expected sound insulation performance of around 29dB_{Rw}.
- 5.6 The roof is understood to be a concrete construction with an expected sound insulation performance of around 50-55dB_{Rw}.
- 5.7 Noise breakout calculations have been undertaken based on the proposed floor plan and external elevations shown on the TADW Architects drawings, the assumed maximum noise level in the snooker club, the sound insulation performances of the glazing and roof areas mentioned above and distance attenuation to the nearest noise sensitive receptors.
- 5.8 A summary of the calculation due to noise breaking out of the snooker club external to residences on the A6 and Higher Ardwick is presented in Table 5.3 and Table 5.4, respectively, along with the comparison with the required criteria.

Table 5.3 – Anticipated Maximum Noise Break-Out of the Snooker Club External to Residence at the A6 Compared to the Required Criteria

Details	dB(A)	Octave Band Centre Frequency, Hz						
		63	125	250	500	1k	2k	4k
Maximum Noise Level, L _{max,F}	86	66	71	75	81	82	80	74
Predicted Snooker Club Noise Level External to the Residence at the A6, L _{eq,T}	29	16	20	34	30	15	3	-8
Criteria = Background noise level -5dB, L _{90,T}	51	51	48	48	45	48	44	31
Comparison of Predicted Noise Level v Criteria	-	-35	-28	-14	-15	-33	-41	-39

Table 5.4 – Anticipated Maximum Noise Break-Out of the Snooker Club External to Residence at Higher Ardwick Compared to the Required Criteria

Details	dB(A)	Octave Band Centre Frequency, Hz						
		63	125	250	500	1k	2k	4k
Maximum Noise Level, L _{max,F}	86	66	71	75	81	82	80	74
Predicted Snooker Club Noise Level External to the Residence at Higher Ardwick, L _{eq,T}	29	16	20	34	30	15	3	-8
Criteria = Background noise level -5dB, L _{90,T}	42	48	43	38	34	39	35	23
Comparison of Predicted Noise Level v Criteria	-	-32	-23	-4	-4	-24	-32	-31

- 5.9 As identified above, noise levels (ambient and maximum) external to both the nearest residences from the snooker club would be at least 5dB below the measured background noise levels.

Plant Noise

- 5.10 Based on the measured background noise level shown in Table 3.3, the rating level from any external condensing unit should be controlled to no greater than 51dB_{L_A,Tr} and 42dB_{L_A,Tr} external to the residences on the A6 and Higher Ardwick, respectively, in order to meet MCC's criteria.
- 5.11 It is understood that a roof mounted condensing unit (TOSHIBA MMY-AP3616FT8P-UK) will be connected to internal cassette type and fan coil ducted type units to facilitate heating (and cooling in summer).
- 5.12 Based on manufacturer provided data, the above condensing unit has a sound pressure level of 65.5dB(A) at a distance of 1 metre.
- 5.13 Considering the above noise level, distance attenuation to residences (about 100m to both residences) and a +3dB correction for any character present, calculations indicate that the rating level external to both the residences on the A6 and Higher Ardwick will be around 29dB_{L_A,Tr} which is significantly below MCC's criteria.
- 5.14 Therefore, noise should not be a determining factor to any planning permission being sought.

APPENDIX A – Acoustic Terminology in Brief

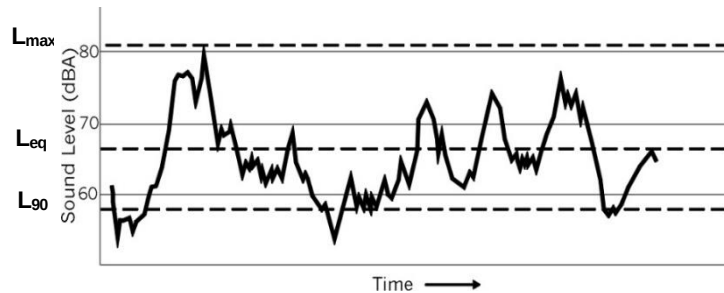
General

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 emphasizes or reduces the importance of certain frequencies within the audible range

Sound / Noise Units

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



Commonly Used Descriptors for Sound / Noise

$L_{Amax,F/S}$	The maximum (A-weighted) sound level measured during a given time. 'Fast' or 'Slow' meter response should be cited.
$L_{Aeq,T}$	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. It can be considered as the "ambient" noise level.
$L_{A90,T}$	The (A-weighted) sound level exceeded for 90% of a measurement period. It is the value often used to describe the "background" noise.
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.

Other Common Acoustics Descriptors

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.
R'_w	Apparent sound reduction index - Single number rating used to describe the sound reduction index of an on-site construction over a range of frequencies, typically 100-3150Hz.
D_w	Single number rating used to describe the on-site airborne sound insulation properties of a material or building element over a range of frequencies, typically 100-3150Hz.
$D_{nT,w}$	Weighted standardized level difference. A single number rating used to describe the on-site airborne sound insulation performance properties of a material or building element over a range of frequencies, typically 100-3150Hz. Standardized to a reference reverberation time of 0.5s (unless otherwise stated).
$L'_{nT,w}$	Single number rating used to describe the on-site impact sound insulation performance properties of a floor over a range of frequencies, typically 100-3150Hz.
$L'_{nT (T_{mf}, \max), w}$	Single number rating used to describe the on-site impact sound insulation performance properties of a floor over a range of frequencies, typically 100-3150Hz, which is calculated in terms of the maximum allowable reverberation time for the specific receiving room.
RT	Reverberation Time. Time (in seconds) required for the sound pressure level in a room to decrease by 60dB after the sound source has stopped
T_{mf}	The average value of the reverberation times one of the frequency range 500Hz–2KHz.
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, t_r .

APPENDIX B – Noise Survey Details

TABLE B1 – Measurement Procedure

Date & Time of Survey:	Sunday 13 November 2022, 0000 to 0130h.					
Personnel:	Naveen Ramesh Simha (AEC).					
Equipment Used:	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	Temp°C	Wind Speed & Direction	Cloud Cover
	13-11-2022	Night	Dry	9°C	Northerly and 1 m/s	95%
Measurement Locations:	Measurements were undertaken at two locations around the development site. Identified as A and B on Figure 1 and described below. A – 4m from nearest carriageway of A6 / Hyde Road. B – 2m from nearest carriageway of Ardwick Green North.					
Measurement Details:	Measurements were undertaken over various periods in terms of L_{eq} , L_{10} , L_{90} , and L_{max} .					
Façade / Free-Field:	A & B - free-field.					
	Full results for the attended measurements are given in Table B2.					
Measured Data:	Full octave band centre frequency data was obtained for all measurements.					

TABLE B2 – Measured Night-time Noise Levels

Location	Period, h	Noise Level, dB			Comments
		L_{Aeq}	L_{A90}	$L_{Amax, F}$	
A	0000 – 0015	62.8	57.9	71.3	Ambient noise level due to road traffic on A6. Maximum noise level due to bus pass by on A6.
	0033 – 0048	62.1	57.0	76.0	
	0105 – 0120	62.1	54.2	73.8	
B	0016 – 0031	58.5	48.7	74.7	Ambient noise level due to road traffic on A6 and Higher Ardwick. Maximum noise level due to car pass by on Higher Ardwick.
	0049 – 0104	58.2	47.0	70.7	
	0121 – 0136	55.5	45.8	69.1	