



To: Ralph Taylor

of: Paul Butler Associates

Dear Ralph,

Feel Good Club, 26-28 Hilton Street, Manchester – Noise Assessment

1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by Paul Butler Associates Ltd to undertake verification measurements of the mechanical services plant that has been installed at the above address.
- 1.2 This assessment has been undertaken to demonstrate compliance with the requirements of Manchester City Council (MCC) as outlined below:

“The Noise Impact Assessment submitted with the application is insufficient to discharge the condition. No assessment has been made of the noise breakout from the equipment through the Louvres or intake position. The report has assessed plant on the roof of the building and from the drawing the intake/extract points are not on the roof. It still needs to be demonstrated that the above equipment will meet our criteria.”
- 1.3 This assessment will be based on background noise level measurements undertaken by AEC in 2021, as per AEC report ref: P4291/R1/MR.
- 1.4 Acoustic terminology is discussed in brief in Appendix A.

2.0 BACKGROUND & SITE DESCRIPTION

- 2.1 This assessment reviews the extract and inlet grill that have been installed at the Feel-Good Club. The extract exhaust grill faces directly onto Tariff Street and the supply intake grill overlooks an inner courtyard located off Tariff Street. Their approximate location is shown on Figure 2.1, below.
- 2.2 The nearest noise sensitive receptor to the proposed grilles are The Vault apartments that are located on Tariff Street. Their location is also shown on Figure 4.1, below.
- 2.3 The Feel Good Club operates between 0900 – 2100h, Monday to Sunday. The items of plant operate in line with these times.

3.0 BASIS OF ASSESSMENT

- 3.1 MCC's requirements relating to noise from building services plant is outlined in their document 'Planning & Noise – Technical Guidance' (2022) (PNTG) and is reproduced below:

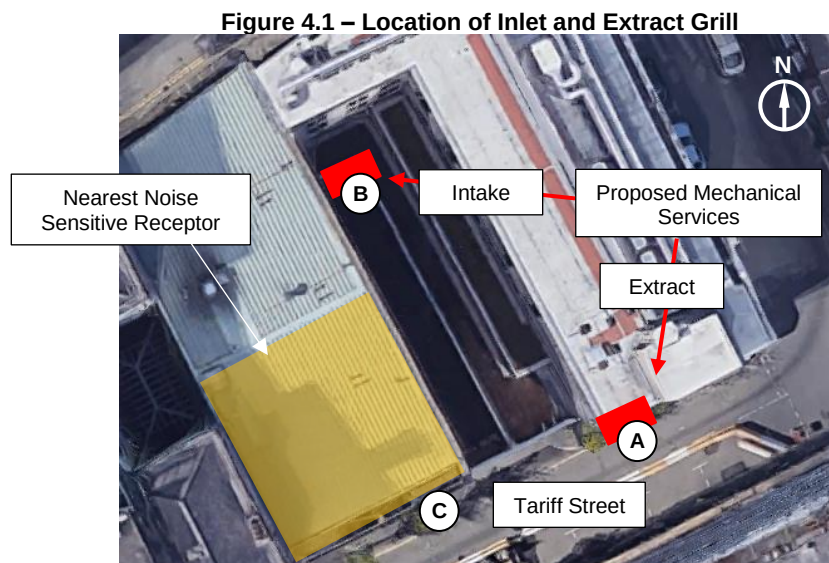
“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location”.

- 3.2 The term '*rating level*' is defined in BS4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' (BS4142) which describes a method for determining the potential impact of sound from an industrial and/or commercial source on a noise sensitive receptor.
- 3.3 Background noise level measurements were undertaken by AEC external to the nearest noise sensitive receptor in 2021. In summary the background noise level was constantly around 42dBL_{A90,15min}.
- 3.4 It should be noted these measurements were undertaken during the Covid-19 enforced lockdown and, therefore, are considered an absolute worst-case for background noise level measurements. Furthermore, they were undertaken between 2300 – 0030h which would also help to form a robust assessment.
- 3.5 Based on this measured the noise level, the rating level limit from the Feel Good Club plant should be controlled to not exceed 37dBL_{Ar,Tr}.

4.0 NOISE MEASUREMENTS AND ASSESSMENT

Plant Source Noise Levels

- 4.1 An attended noise level survey was undertaken by AEC between 1310 and 1351h on Tuesday 21 February 2023. Measurements were undertaken at 2m from the intake and 5m from the extract grills and external to the nearest noise sensitive receptor and these locations are identified on Figure 4.1, below (A – Extract, B – Inlet, C – Receptor).



- 4.2 Measurements were undertaken at each location, with and without the plant items operating. The results are presented in Table 4.1, below.
- 4.3 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 in Table B.1 of Appendix B and the measured data is presented in Table B.1.

Table 4.1 – Measurement Results

Measurement Location	Plant Operating?	Noise Level, dB	
		Ambient, $L_{Aeq,T}$	Background, $L_{A90,T}$
A (Extract @ 2m)	Yes	58	55
	No	63	54
B (Intake @ 5m)	Yes	53	51
	No	53	51
C (Receptor)	Yes	57	52
	No	62	53

- 4.4 During periods when the extract was operating, at Location A, ambient noise levels were dominated by road traffic and pedestrians on Tariff Street. Noise from the extract grille was barely perceptible but only during periods where there were lulls in these sources.
- 4.5 At Location B, whilst operating, noise from the intake was entirely inaudible. The noise climate was dominated by existing plant in the courtyard.
- 4.6 At Location C, noise from neither the intake or extract was audible when they were operating. The noise climate was dominated by road traffic and pedestrians in the area.

Assessment

- 4.7 As stated above, at 2m from the extract grille, the plant noise was only perceptible during lulls in road traffic and pedestrians. However, as there is a 1dB increase in background noise levels with the plant operating, it is considered that noise from this source is no greater than 48dB(A) at 2m.
- 4.8 As the inlet grille was inaudible against the noise climate in the courtyard, it is estimated that it would be some 10dB below the background noise level in the courtyard. Based on this, noise levels from the inlet grille would be no greater than 41dB(A) at 5m.
- 4.9 In order to confirm the exact noise level from the plant items, AEC has determined the overall specific noise level at the receptor, based on the determined noise levels from each item of plant at source, and the distance and screening attenuation to the receptor, where applicable. This calculation is presented in Table 4.2, below.

Table 4.2 – Plant Items Calculation

Source	Noise Level, dB(A)	@ Distance, m	Attenuation, dB		Resultant, dB(A)
			Distance	Screening	
Extract	48	2	-14 ($=20 \cdot \log(2/10)$)	0	34
Inlet	41	5	-13 ($=20 \cdot \log(5/22)$)	-5	23
Total Specific Noise Level, $L_{Aeq,Tr}$					34

- 4.10 Based on the above calculations, the specific noise level from the two items of plant combined would be 34dB $L_{Aeq,Tr}$, external to the nearest noise sensitive receptor.

- 4.11 As the plant is inaudible at the receptor, no acoustic character corrections have been applied and, therefore, this figure is representative of the rating level i.e., $34\text{dBL}_{\text{Ar,Tr}}$.
- 4.12 Comparing this figure with the criteria for mechanical services plant to be 5dB below the existing background noise level (equating to a rating level limit of $37\text{dBL}_{\text{Ar,Tr}}$) would, therefore, indicate that the requirements have been achieved as this limit is not exceeded.
- 4.13 Based on the above, AEC are satisfied that the condition placed on the scheme relating to the above can be discharged.

I hope the above is clear and of assistance at this stage.

Yours sincerely



Ross Chamberlain

Checked by: 

APPENDIX A – Acoustic Terminology in Brief

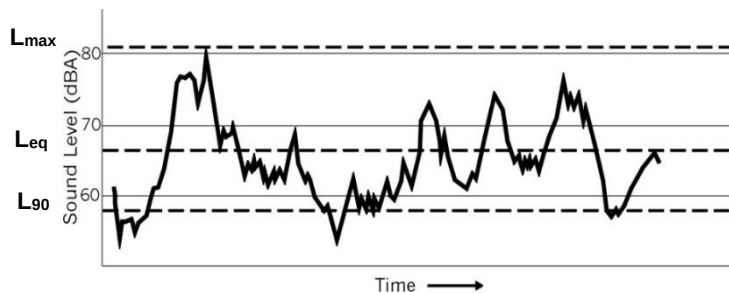
General

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

Free-field Level	This refers to the sound level measured outside, away from reflecting surfaces.
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.
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.
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, <i>r</i> .
Rating Level, L_{Ar,Tr}	Specific sound level plus any adjustment for the characteristic features of the sound

APPENDIX B – Measurement Details

Table B.1 – Measurement Procedure

Date & Time of Survey:	Tuesday 21 February 2023, 1310 – 1341h.					
Personnel:	Ross Chamberlain (AEC).					
Equipment Used:	B&K 2260 Real Time Analyser (AEC Kit 2)					
Calibration:	The sound level analysers, 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
	21/02/23	Day	Dry	7°C	Negligible	80%
Measurement Locations:	Measurements were undertaken at three locations, as per Figure 4.1. A – 2m from the extract grille. B – 5m from the inlet grille. C – 1m external to the receptor.					
Measurement Details:	Measurements were undertaken over various periods in terms of L_{eq} , L_{10} , L_{90} , and L_{max} .					
	Full results for the attended measurements are given in Table B.2.					
Measured Data:	Full octave band centre frequency data was obtained for all measurements.					

Table B.2 – Measured Noise Levels

Location	Period, h	Noise Level, dB		Comments
		L_{Aeq}	L_{A90}	
A	1310 - 1313	58	55	Noise climate dominated by road traffic and pedestrians. Plant only perceptible during lulls in these sources.
	1325 - 1329	63	54	
B	1315 - 1318	53	51	Noise climate dominated by existing plant items in the courtyard.
	1329 - 1331	53	51	
C	1318 - 1324	57	52	Noise climate dominated by road traffic and pedestrians.
	1336 - 1341	62	53	