



Ref: P5291/L02/LTH

2 August 2024

From:	Liam Harrison	Check ed	AGB
-------	---------------	----------	-----

Ardwick Academy – Plant Noise Assessment

1.0 INTRODUCTION

- 1.1 Acoustic & Engineering Consultants Limited (AEC) has been instructed by The Dean Trust to undertake a noise impact assessment of the new external plant for Ardwick Academy, in relation to the planning permission that has been granted.
- 1.2 Manchester City Council has granted permission (application no. 137058/FO/23) for the erection of a single storey structure to create ancillary fitness suit and studio within the undercroft of an existing school building. Condition 6b associated with the permission states:
- 'b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development achieves a rating level of 5dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of nonconformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.'*
- 1.3 The previous version of this report outlined the appropriate site limits for atmospheric plant noise emissions prior to installation, in order to comply with the requirements of planning condition 6b. The current version includes the pre-completion validation assessment of the plant post commissioning.
- 1.4 Acoustic terminology is discussed in brief in Appendix A.

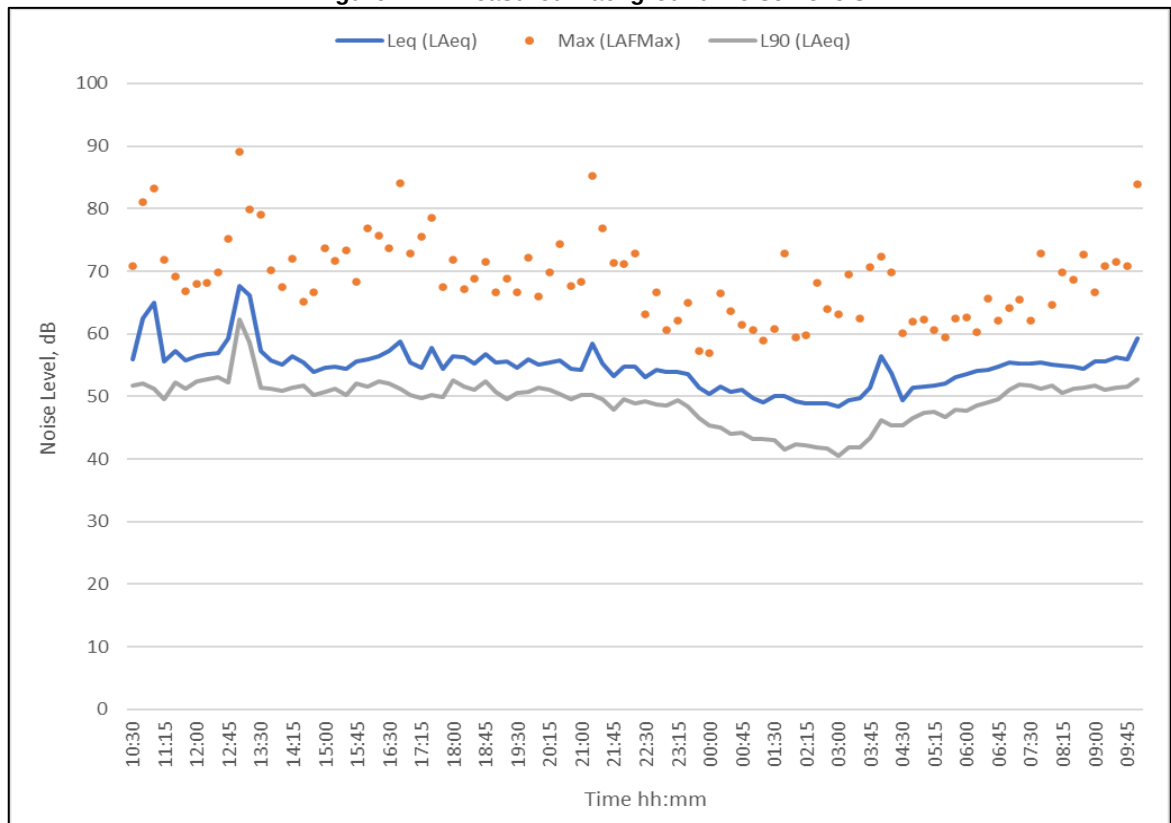
2.0 BACKGROUND NOISE LEVELS

- 2.1 Prior to installation to the new plant items, a logging meter was installed at Location A (refer to Figure 2.1, below) and noise levels were continuously measured from approximately 1400h on Monday 18 March to 1200h on Tuesday 19 March. Full details of the measurement procedure are presented in Appendix B and the measured noise levels are presented in Figure 2.2 below.
- 2.2 With reference to Figure 2.2, the typical background noise levels affecting the nearest residential properties on South Street are approximately 50dB $L_{A90,15min}$ during the school operating hours. Furthermore, if the plant switches on at 0600h to warm the school in the morning, the background noise levels at this time are around 48dB $L_{A90,15min}$.

Figure 2.1 – Site Plan Showing Monitoring Location



Figure 2.2 – Measured Background Noise Levels



3.0 POST COMPLETION ASSESSMENT

Verification Noise Measurements

- 3.1 Three external condenser units have been installed on the eastern corner of the building at ground floor level, approximately 50m from the nearest residential window on South Street, as identified on Figure 2.1, above. The units are located in metal cages meaning there is no acoustic screening from the enclosure.
- 3.2 Measurements of the plant were undertaken post installation on 29 July 2024. Noise levels measured at 1m from and directly central to the source were no greater than 54dB(A).
- 3.3 At the time of the measurements, external temperatures were approximately 26°C and the plant was running at full duty. Therefore, the results are deemed to represent a 'worst-case' scenario in terms of noise emissions.

Plant Noise Limit

- 3.4 The development has permission to operate during the daytime up to 2200h. The typical background noise levels affecting the nearby residential properties on South Street to the east of the site up to this time are typically 50dB_{LA90,15min}. Based on this, the noise rating level from the new plant should be no greater than 45dB_{LA,Tr}.
- 3.5 The nearest residential properties on South Street are some 50m from the new plant items. Based on the measured noise level at 54dB(A) at a distance of 1m and increased distance attenuation the free-field noise levels external to the façade of properties on South Street would be no greater than 20dB(A). This level doesn't even take into account any screening provided by the existing school buildings
- 3.6 As such, the operating plant noise level is some 30dB below the prevailing background noise. At 30dB below the lowest measured background noise level the plant readily complies with the requirements of planning condition 6b (ref: 137058/FO/23).

I trust the above is clear and of assistance. If you have any further queries please do not hesitate to contact me.

Yours Sincerely,



Liam Harrison

Checked by: AGB

Appendix A - Acoustic Terminology in Brief

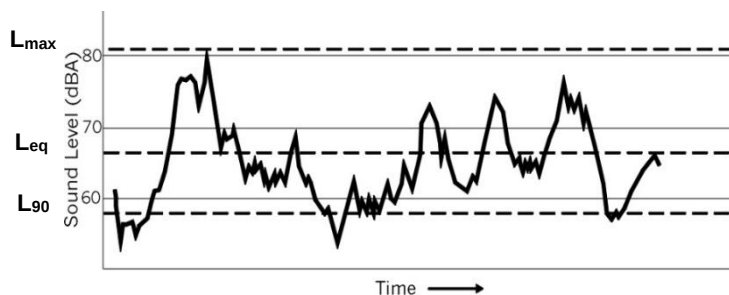
General

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.



Example of Sound Level Varying with Time

L_{Amax}	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, <i>T</i> . 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 often used to describe background noise.
$L_{EP,d}$	The personal daily noise exposure of a person. It is based on a reference working day period of 8hrs and takes into consideration different noise level exposures for different tasks including the duration of each task.
Free-field	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.

APPENDIX B – Noise Survey Details

Date & Time of Survey:	1400h on Monday 18 March to 1200h on Tuesday 19 March 2024.
Personnel:	Andy Burke (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. There was no significant drift of calibration. Calibration certificates are available on request.
Weather Conditions:	The survey was unattended however, with reference to the weather forecast, conditions were dry, with 100% cloud coverage and temperatures of approximately 8°C.
Measurement Locations:	The microphone was connected to the sound level meter via an extension cable and fixed next to the school exit gate.
Measurement Details:	Measurements were logged continuously over 1s for post processing and assessment.
	Measurements were undertaken over various periods in terms of L_{eq} , L_{10} , L_{90} , and L_{max} .
	Free-field.
Measured Data:	Full 1/3 rd octave/octave band centre frequency data was obtained for all measurements.