



PLANT NOISE ASSESSMENT

NEW MOSTON PRIMARY SCHOOL

Conlon Construction

REPORT NO. 2061030-RSKA-RP-001-(01)





General notes

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1 Introduction

RSK Acoustics has been instructed by Conlon Construction to undertake an acoustic assessment of proposed plant associated with a kitchen extension, at New Moston School.

RSK Acoustics have carried out a noise survey and analysis, to determine the background noise levels at the nearest existing receptors. The noise emissions generated from the proposed plant have been calculated at the nearest receptors and assessed against the criteria specified by the local authority, Manchester City Council.

This report details the noise survey undertaken, evaluates predicted noise emissions from the proposed plant equipment at the nearest noise sensitive receptors and provides recommendations for noise mitigation measures, where necessary.



2 Site Description

New Moston Primary School is located in the New Moston area of Manchester.

The proposed kitchen extension is located along the east façade of the main building towards Moston Lane East. The kitchen extension includes the addition of an intake louvre, which will be located along the south façade facing the car parking area, and an extract termination, which will be situated on the roof.

It is understood the kitchen plant will only be in use during the operational hours of the primary school during the daytime. Therefore, the assessment considers daytime hours only.

Two existing receptor locations have been selected for this assessment, which were identified as the nearest noise sensitive receptors to the proposed new plant and thus likely to be impacted the most to the new plant installations:

- ESR1 – 1st floor front façade of 222 Moston Ln E, Manchester M40 3QH. This receptor is located to the north east of the proposed kitchen extension.
- ESR2 – 1st floor rear façade of 37 Annesley Road, Manchester M40 3PB. This receptor is located to the south west of the proposed kitchen extension.

The location of the nearest noise sensitive receptors, the site boundaries and the plant room location are depicted on the site plan presented in Appendix A.



3 Noise Survey

3.1 Methodology

A long-term unattended noise survey was undertaken between 1145 hours 6th April 2022 and 1130 hours on 11th April 2022, at locations representative of the background noise climate of ESR1 and ESR2. The measurement locations have been illustrated as MP1 and MP2 within the site plan in Appendix A.

Measurements of the L_{Aeq} , L_{Amax} and L_{A90} indices were recorded over consecutive 15-minute intervals for the duration of the survey, utilising the equipment listed within Table 1 (see attached Glossary of Acoustic Terms for an explanation of the measurement parameters used).

Item	Manufacturer	Type
Sound Level Analyser	01dB	Fusion
Sound Level Analyser	Rion	NL-52
Acoustic Calibrator	Rion	NC-74
Weatherproof windshield	Rion	WS-15

Table 1 *Monitoring equipment used during noise survey*

The microphones were fitted within weatherproof enclosures, and the sound level meters were calibrated before and after the survey, in order to confirm an acceptable level of accuracy. No significant drift was noted to have occurred.

The weather conditions when installing and collecting the noise monitoring equipment was overcast and wet, but with no significant breeze. It is understood that the weather remained like this throughout the survey, with the exception of Friday 8th April 2022. From the met office weather data, weather during this day was noted to be clear and sunny with temperature ranges between 2-9°C.

Following analysis of the measurement data, it is clear that inclement weather impacted background noise levels between 6th to 7th April and 9th to 11th April 2022. It is likely that the noise data collected on these days were elevated due to wet or damp roads.

Therefore, the data collected on Friday 8th April 2022 will be used to establish the background noise levels at the nearest receptors which shows minimum effects of extraneous weather conditions.



3.2 Results and Analysis

The results of the noise survey are shown in the time history graphs presented in Appendix B below.

The noise climate at the measurement locations comprises constant traffic from the A663 to the west of the site, and distant traffic from the M60 approx. 750m to the northeast of the site. Very occasional traffic was noted on Moston Lane East, which runs alongside the school.

The minimum background noise levels have been derived from both monitoring locations based on the 1 hour noise measurements recorded during the daytime period on 8th April 2022.

These levels are set out in Table 2 below:

Location	Minimum Background Noise Level, $L_{A90, 1 \text{ hour}}$ dB(A) Daytime (07:00-19:00 hours)
MP1 – 1 st floor façade of 222 Moston Ln E	44
MP2 – 1 st floor rear façade of 37 Annesley Road	42

Table 2 Minimum daytime background noise levels, $L_{A90, 1 \text{ hour}}$ measured on 8th April 2023



4 Plant noise Limits

Correspondence was carried out with Lisa Jones of Manchester City Council regarding the noise methodology. The noise assessment criteria taken from the Manchester City Council noise and planning guidance is as below:

"NSE6

External plant/equipment/servicing

a) 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. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

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 conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site.

With regard to the timing of the baseline assessment, the Easter Break will be fine as it will likely be more representative of the quietest time that the equipment will be in use in the daytime. Should any of the equipment be in use during night-time hours then a night-time baseline measurement should also be undertaken."

It is understood the proposed kitchen plant will only operate during the daytime, therefore the assessment considers daytime hours only.

The $L_{Aeq,t}$ noise level limits, in accordance with the criteria set by MCC, during the daytime have been outlined below for reference based on the background levels presented in Table 2:

Location	Noise Emission Limit, dB Daytime $L_{Ar,1hour}$
MP1 – 1 st floor front façade of 222 Moston Ln E	39
MP2 – 1 st floor rear façade of 37 Annesley Road	37

Table 3 *Plant noise emission limits at the nearest noise sensitive properties*

The above noise limits are set at 1m from the most exposed noise sensitive location of the corresponding assessment position and apply to all proposed plant running in unison.



5 Plant Noise Assessment

5.1 Details of Proposed Equipment

The proposed noise generating plant items located in as part of proposed kitchen extension are as follows:

- Kitchen Canopy Extraction System
- Kitchen Fresh Air System

The proposed plant is understood to be fitted with atmospheric side attenuators at both the low-level intake and the vertical discharge.

At the time of this assessment, the in-duct sound power levels of the proposed plant were unavailable. However, it has been confirmed by the client¹ that the resulting noise levels from the plant will reach a sound pressure level of 45dB(A) at a distance of 5m from each intake louver and extract termination. These sound levels include the noise reduction provided by the proposed attenuators.

Noise from the proposed plant has been assessed to the two nearest noise sensitive windows. These assessment positions are indicated on the site plan presented in Appendix A and described below:

- ESR1 – 1st floor front façade of 222 Moston Lane East, the nearest receptor to the proposed extension.
- ESR2 – 1st floor rear façade of 37 Annesley Road, nearest receptor to the southwest of the proposed extension.

5.2 Assessment Results

The predicted noise levels from each piece of plant have been calculated to provide an overall noise level. This noise level has been assessed against the criteria detailed in Section 4 of this report.

The plant is not expected to exhibit any tonal or impulsive characteristics provided it is well maintained. It is also not expected to have the presence of "... characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment..." as described in BS 4142:2014 due to the predicted levels being significantly lower than the existing minimum background levels.

The results of this can be seen in below.

Results	Noise sensitive receptor location	
	ESR1	ESR2
Predicted specific sound level, $L_{Aeq,1hr}$ (dB)	28	27

¹ Email confirmation from the Walmsley Associates (dated: 2nd May 2023)



Results	Noise sensitive receptor location	
	ESR1	ESR2
Character corrections	0	0
Predicted rating sound level, $L_{Ar,1hr}$ (dB)	28	27
Noise Emission Limit, $L_{Ar,1 hour}$ (dB)	39	37
Excess of rating over emission limit (dB)	-11	-10

Table 4 *Calculated plant noise emission levels at the nearest noise sensitive receptors*

The results of the assessment indicate that the plant noise levels from the proposed plant demonstrate compliance with the criteria at both ESR1 and ESR2. Therefore, further mitigation measures are not required to achieve the criteria as set by the local authority.



6 Conclusions

RSK Acoustics has been instructed by Conlon Construction to undertake an acoustic assessment of the plant associated with a kitchen extension at the New Moston School. The noise assessment has considered the noise impact at the nearest receptors windows located on the 1st floor of the facades.

This report has provided details of a noise survey conducted at the site and has set noise emission limits for the proposed plant items in line with guidance from the local authority.

Noise from proposed plant has been assessed and it has been determined that the noise emissions will comply with the limits set, provided the atmospheric side attenuators are installed as per the plant drawings and sound level specifications provided.

Therefore, the noise emission requirements of the local authority will be achieved.



Glossary

Term	Definition
Ambient sound	The total sound at a given place, usually a composite of sounds from many sources near and far.
Background sound, $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval.
dB	Decibel. Scale for expressing sound pressure level. It is defined as 20 times the logarithm of the ratio between the root mean square pressure of the sound field and a reference pressure i.e. 2×10^{-5} Pascal.
dB(A)	A-weighted decibel. This provides a measure of the overall level of sound across the audible spectrum with a frequency weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies. Example sound levels include: 140 dB(A) Threshold of pain 120 dB(A) Threshold of feeling 100 dB(A) Loud nightclub 80 dB(A) Traffic at busy roadside 60 dB(A) Normal speech level at 1m 40 dB(A) Quiet office 20 dB(A) Broadcasting studio 0 dB(A) Median hearing threshold (1000 Hz)
Frequency	The repetition rate of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the Hertz (Hz), which is identical to cycles per second. A thousand hertz is often denoted as kHz, e.g. 2 kHz = 2000 Hz. Human hearing ranges approximately from 20 Hz to 20kHz.
$L_{Aeq,T}$	This is defined as the notional steady sound level over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
NR	Noise rating. A set of curves based on the sensitivity of the human ear. They are used to give a single-figure rating for a range of frequencies.
Rating level	Specific sound level of a source plus any adjustment for the characteristic features of the sound.
Residual sound	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.
Sound absorption	Process whereby sound energy is converted in to heat. Sound absorption properties is expressed as the sound absorption coefficient α or the sound absorption class (A-E).
Sound insulation	The reduction or attenuation of airborne sound by a solid element between source and receiver.
Specific sound	Sound pressure level produced by the source being assessed at the assessment location.

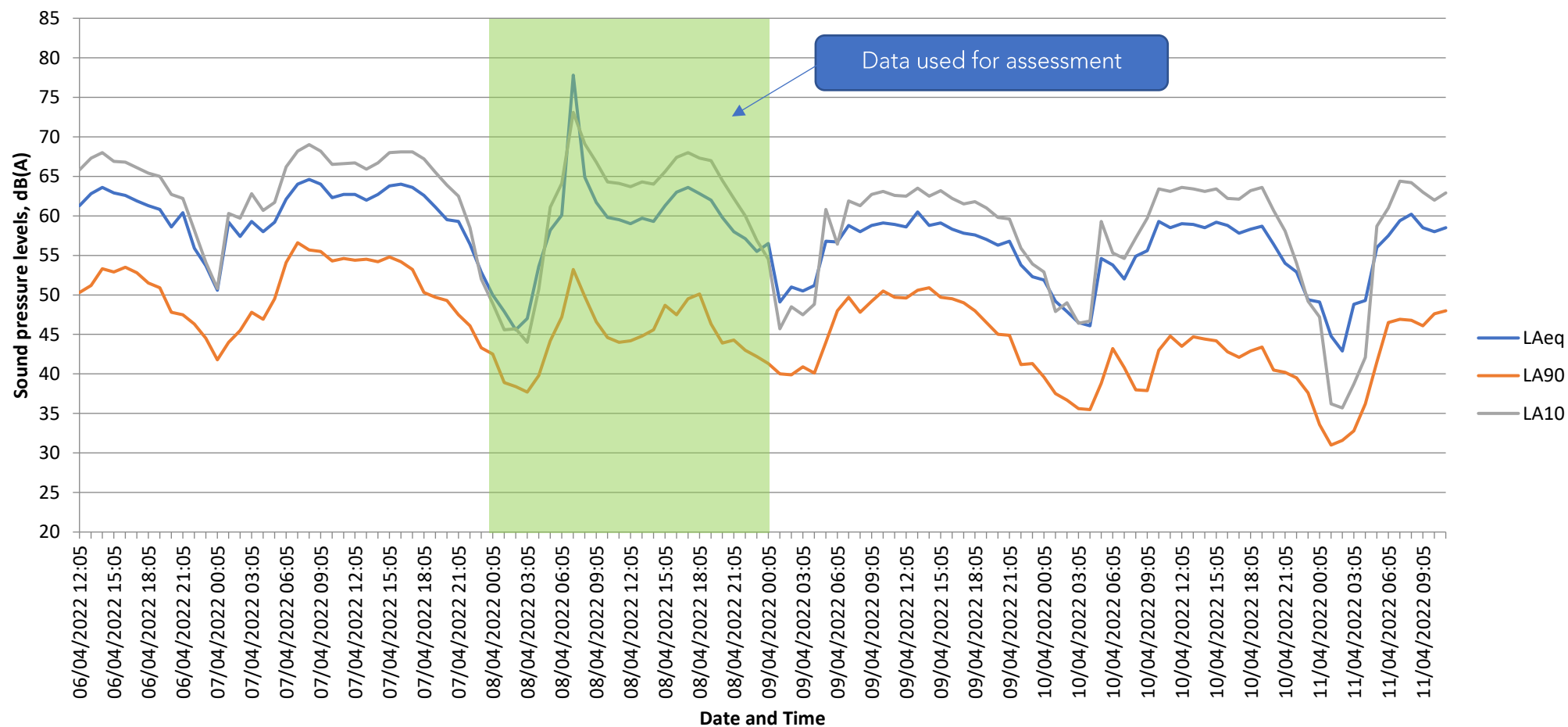


Appendix A Site plan



Appendix B Time History

Hourly evolution - Measurement at ML1



Hourly evolution - Measurement at ML2



