

The Co-operative Funeralcare

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Plant Noise Survey

On behalf of



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1.0 Introduction

- 1.1. Noise Solutions Ltd has been appointed by AB Group to undertake a noise survey to establish noise emissions from existing external plant serving the Co-operative Funeralcare on Field End Road in Eastcote.
- 1.2. To assist with the understanding of this report a glossary of acoustic terms can be found in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at <http://www.acoustic-glossary.co.uk>.

2.0 Site conditions

- 2.1. The Co-operative Funeralcare office is located on the west side of Field End Road in Eastcote. The store is currently operational.
- 2.2. The Co-operative occupies the ground floor unit of the building, with residential flats above on the first and second floors.
- 2.3. External refrigeration and air conditioning equipment are located at the rear of the building, where they are mounted on the rear wall. Equipment consists of one air conditioning (AC) unit, and one refrigeration condenser.
- 2.4. The nearest noise sensitive property to the plant area will be the flats (Receptor R1) above the office, with rear windows approximately 8m away and screened entirely from line of sight by the ground floor building envelope. The windows of 2 Crescent Gardens (Receptor R2) are approximately 30m from the plant area but also have no direct line of site to the plant area due to the concrete fence in between.
- 2.5. The air conditioning unit runs only while the offices are in use, during the normal working day. The refrigeration condenser may operate 24 hours per day (albeit at a reduced duty at night when demand is lower).
- 2.6. A site plan showing the site and surrounding area and the nearest noise sensitive premises used in this assessment is presented in **Appendix B**.

3.0 Existing noise climate and plant noise criteria

- 3.1. Prior to the fit out of the store, a Plant Noise Guidance report was prepared by Noise Solutions Limited (Document reference: 87391/NIA dated 13th July 2021). Based on the results of an environmental noise survey and the typical requirements of the local authority, the plant noise limits at the nearest residences were established. These are summarised in Table 1 below.

Table 1 Plant noise emissions criteria at residences

Period	Operational plant items	Cumulative plant rating noise level limit, dB(A)
Daytime (07.00 – 23.00 hours)	AC and Refrigeration condenser	34
Night-time (23.00 – 07.00 hours)	Refrigeration condenser only	30

- 3.2. It is noted that the above criteria correlate to a 'low impact' when assessed in accordance with BS 4142:2014 '*Methods for rating and assessing industrial and commercial sound*' and are based on plant noise rating levels being no louder than the representative background noise level.

4.0 Investigative survey

- 4.1. An investigative site survey was undertaken by NSL during the evening of Monday 31st January 2022, between 19.00 and 21.00 hours. An engineer from AB group was present to operate the plant as required.
- 4.2. Measurements were made of AC unit and the refrigeration condenser within the plant area and at locations representative of the affected residential receptors. Measurements for Receptor R1 were taken at first floor flat roof of the building above the plant area. Measurements for Receptor R2 were taken at the boundary fence opposite the plant area.
- 4.3. Measurements of plant noise emissions were undertaken over short durations (30 seconds) to minimise the influence of extraneous sources (e.g., car pass-bys, passing aircraft, etc.).
- 4.4. Both broadband and one-third octave band frequency data was measured. The measured LA90 noise measurements have been used in this assessment since noise from the plant was constant during operation and, again, this minimised influence from extraneous sources.
- 4.5. The AC unit is noted to operate at a constant duty whilst operational. The refrigeration condenser is noted to ramp up to a constant speed when the coldroom inside the Co-op requires cooling. After the required temperature is achieved in the coldroom, the condenser fan turns off. It is understood that the settings for daytime and night-time operation are the same, with lower night-time noise levels resulting solely from likely reduced demand.

- 4.6. Weather conditions during the survey were still with a temperature of 6°C. Road surfaces in the surrounding area were dry with clear skies. Weather conditions were unlikely to have affected the results of the plant noise survey.

Results

- 4.7. The results of the noise readings from the plant are summarised in the following table. It is noted that, due to lack of access to the residential facades, measurements were taken at a location representative of the receptor windows as mentioned above.
- 4.8. Noise measurements for R1 were measured approximately 7m from the windows above the plant area, and noise measurements for R2 were measured at the boundary fence, approximately 19m from R2 windows. Additional distance and screening corrections are applied where appropriate to predict the noise levels at the residential windows.

Table 2 Plant noise readings at receptors

Plant	Measured specific plant noise $L_{(A)90}$ levels (dB)		
	1m from plant	R1	R2
All off (residual)	45	45	45
AC only	49	27	<35
Refrigeration Condenser only	33	30	25
All on	57	31	27

Discussion

- 4.9. Measurements of the plant items 1m away indicate that both units are operating at 100% capacity according to the manufacturer noise data.
- 4.10. Table 3, below, assesses the measured external plant noise rating levels against the daytime and night-time emissions criteria specified within Table 1.

Table 5 Assessment of predicted rating levels at the nearest noise sensitive receptors

Receptor	Period	Predicted rating level at receptor, L_{Aeq} (dB)	Criterion (dB)	Difference
R1	Daytime (07.00 - 23.00 hours)	31	34	-3
	Night-time (23.00 - 07.00 hours)	30	30	0

Receptor	Period	Predicted rating level at receptor, L_{Aeq} (dB)	Criterion (dB)	Difference
R2	Daytime (07.00 - 23.00 hours)	27	34	-7
	Night-time (23.00 - 07.00 hours)	25	30	-5

- 4.11. The noise level measurements demonstrate that cumulative noise emissions from the plant items will comply with the proposed limits at the nearest noise sensitive properties.

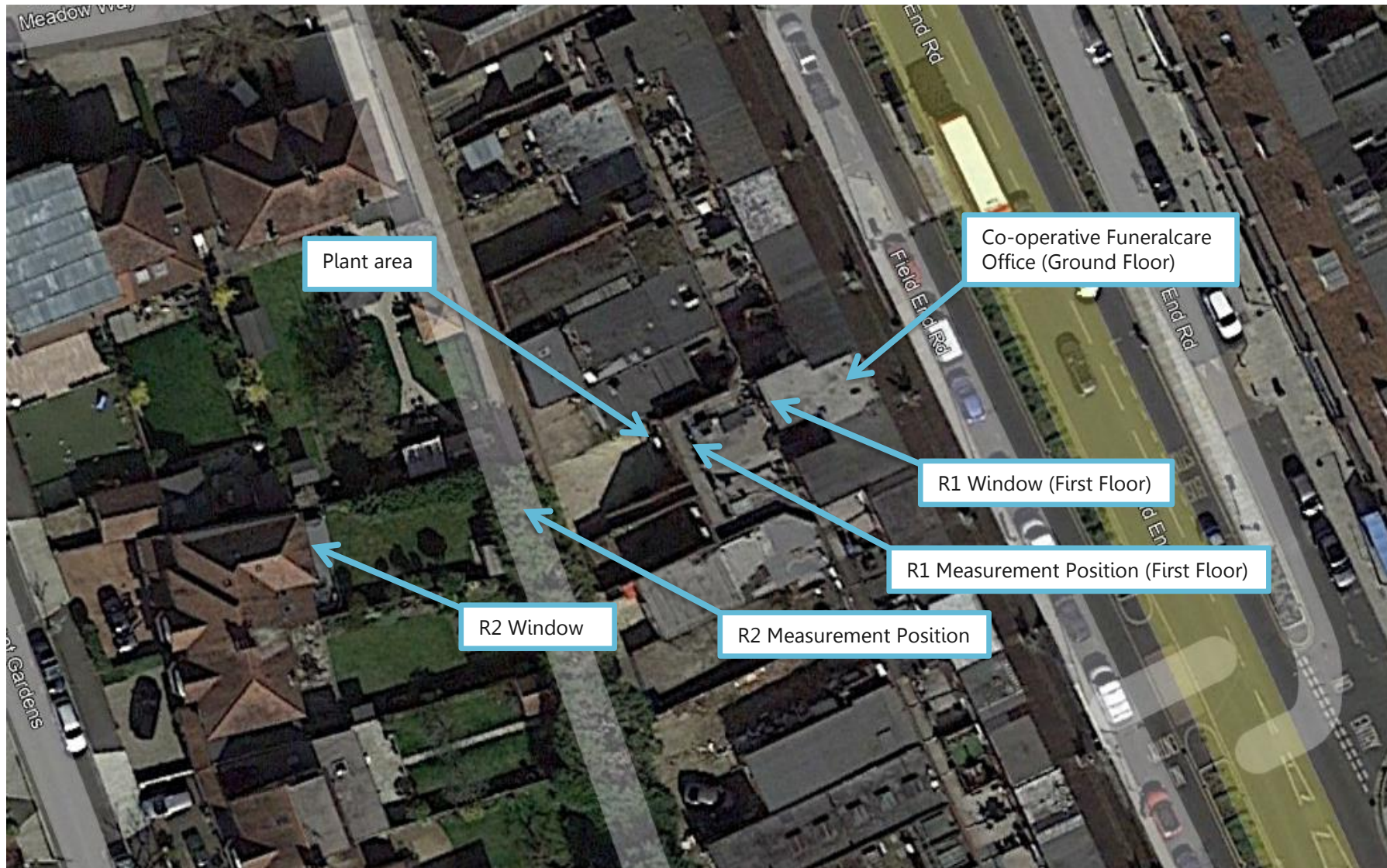
5.0 Summary

- 5.1. Noise Solutions Ltd has been appointed by AB Group to undertake a noise survey to establish noise emissions from existing external plant serving the Co-operative Funeralcare on Field End Road in Eastcote.
- 5.2. NSL have attended site to undertake plant noise readings externally at the nearest residential windows in order to determine compliance, or otherwise, with local authority requirements.
- 5.3. The results of the survey indicate that noise from the air conditioning unit and the refrigeration condenser are within the daytime and night-time criteria at the closest and most affected residential windows.
- 5.4. Noise mitigation measures are not required for the plant items.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Photograph of site showing areas of interest



Appendix C Plant noise survey – January 2022

Details of sound survey

- C.1 Measurements of the existing plant noise levels were undertaken between 19.00 hours and 21.00 hours on Monday 31st January 2022.
- C.2 The sound level meter was programmed to record the A-weighted L_{eq} , L_{90} , L_{10} and L_{max} noise indices for short sample periods during the duration of the survey. One-third octave frequency data was also obtained.

Measurement position

- C.3 Measurements for R1 were taken at the first-floor roof of the site. Measurements for R2 were taken at the boundary fence. Measurement positions are marked in Appendix B.

Equipment

- C.4 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

Equipment used for sound pressure level survey on 20th November 2019

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977/ 69747	20/08/2020	14015672
Condenser microphone	ACO Pacific 7052E / 70829		
Preamplifier	Svantek SV12L / 73687		
Calibrator	Svantek SV 40A / 10843	29/07/2021	1500732-1