

The Co-operative
8-16 Southwick Square
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**Plant Noise
Commissioning**

On behalf of

 **Healy's**

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1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been appointed to undertake commissioning sound testing for newly installed plant at the Co-operative located at Southwick Square, Southwick.
- 1.2. It is understood that complaints were received from the previous running plant, although none was received since the new plant was installed approximately two months ago.
- 1.3. Noise level emissions from the installed plant have been measured and assessed against the emissions criteria outlined in the original Noise Impact Assessment report.
- 1.4. A glossary of acoustic terminology is given in [Appendix A](#).

2.0 Details of development proposals

- 2.1. The Co-operative store occupies part of the ground floor of a parade of shops in a 'local centre' setting around Southwick Square.
- 2.2. The new installed plant is located on the roof of a single storey extension at the rear (north side) of the building.
- 2.3. Plant comprises a refrigeration gas cooler and four air conditioning (AC) units. A refrigeration compressor pack is installed internally and has been excluded from this assessment.
- 2.4. The AC units operate only during the daytime; the refrigeration plant operates at all times but may run at reduced duty at night when the store is closed, and cooling demands are lower.
- 2.5. A site plan showing the site and surrounding area, the nearest noise sensitive properties and the background noise monitoring location used in this assessment is presented in [Appendix B](#).

3.0 Nearest noise sensitive receptors

- 3.1. The nearest residential properties to the plant are the first and second floor dwellings above the parade of shops at approximately 20m distance. The plant is set back from the rear elevation of the store such that it is screened by the building structure.
- 3.2. The rear of houses on Southdown Road (Receptor R2) are around 40m from the plant. No screening is provided to Receptor R2.

4.0 Plant noise design criteria

Adur District Council

- 4.1. Policy 34 *Pollution and Contamination* in the Adur Local Plan 2017 (adopted December 2017) states that “where appropriate ... noise assessments will be required in conjunction with development proposals”. Reference is also made to the Planning Noise Advice Document: Sussex, July 2015.
- 4.2. The *Planning Noise Advice Document for Sussex* contains the following paragraph in relation to Industrial and Commercial Noise Sources.

The starting point for designing any industrial/ commercial development should be to minimise noise “as far as reasonably practicable”. The rating level of the plant/process, when measured in accordance with BS4142:2014, should, where practicable, be no greater than the existing background levels when measured in accordance with BS4142:2014. There may be instances, for specific sites, where a rating level below background is deemed appropriate. This can be determined through prior discussion with the Local Planning Authority or Local Environmental Health Department. For example, a rating level of 10 dBA below background may be required in certain instances if there are specific concerns such as the potential for noise creep. It is considered that meeting these criteria would avoid adverse noise impacts, in the interests of ensuring a good standard of amenity and protecting human health. Where these criteria are not attainable, the noise report should explain why, and how best practicable means will be implemented to control noise in order to satisfy the LPA that the development is acceptable

- 4.3. As the newly installed plant replaced an existing installation, there is limited risk of noise creep and a limiting plant noise Rating level no louder than the prevailing background noise level is considered appropriate.

BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.

- 4.4. BS 4142:2014 +A1:2019 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014¹ includes “sound from fixed plant installations which comprise mechanical and electrical plant and equipment”.
- 4.5. The procedure contained in BS 4142:2014 is to quantify the “specific sound level”, which is the measured or predicted level of sound from the source in question over a one hour period for the

¹ For brevity, references to BS 4142 and BS 4142:2014 should be read as BS 4142:2014 + A1:2019

daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

- 4.6. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.
- 4.7. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."*
- 4.8. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."*
- 4.9. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:
- *Typically, the greater this difference, the greater the magnitude of the impact.*
 - *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
 - *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;*
 - *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*
- 4.10. The standard does state that *"adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*
- 4.11. The standard goes on to note that: *"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

- 4.12. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

- 4.13. BS 4142:2014 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Proposed criteria

- 4.14. NSL undertook a Noise Impact Assessment prior to the installation of the current plant (report reference 93078/NIA dated 27th May 2025). A background noise survey was conducted to determine emissions criteria at the nearest residential windows to meet the requirements of Adur District Council. A summary of the recommended plant noise limits is given in Table 1.

Table 1 Proposed plant noise limits at noise sensitive residential receptors

Period	Cumulative plant noise level, dB(A)
Daytime (07.00 – 23.00 hours)	40
Night-time (23.00 – 07.00 hours)	33

- 4.15. These limits will result in a plant noise rating level at or below that at which a “low impact” would be expected, according to the method described in BS 4142:2014.

5.0 15th December 2025 Plant noise survey

- 5.1. This survey was undertaken with regular duty of the plant, setback at 61% for day and night, the gas cooler fans set to 39% (3.86V control voltage), and the AC units in test mode to simulate normal usage.

Survey methodology

- 5.2. Noise Solutions Ltd attended site between 18.30 and 20.00 hours on Monday 15th December 2025 to measure noise emissions from the plant.
- 5.3. A service engineer was present on site to operate the plant for the duration of the survey. Measurements were taken of the following scenarios:
- All plant off
 - All plant on at regular set duty (AC condensers on test mode setting)
 - Gas cooler only
 - AC units only
- 5.4. Measurements of sound pressure levels were undertaken over short durations (30 seconds) to minimise the influence of extraneous sources (e.g., car pass-bys, passing aircraft, etc.) at 1m from the condenser units, at 1m from the gas cooler units, and at a residential proxy position approximately 3m from the windows of Receptor R1 on the first floor.
- 5.5. Both broadband and one-third octave band frequency data was measured, as well as the L₉₀ level.
- 5.6. Details of the noise monitoring equipment used during the survey are detailed in the following table.

Table 2 Details of plant noise monitoring equipment

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977D / 99071	13/05/2025	1512255-1
Condenser microphone	Microtech MK255 / 25430		
Preamplifier	Svantek SV12L / 129686	06/11/2025	1515201-2
Calibrator	Svantek SV 33B / 83850		

- 5.7. The ambient temperature during the survey was 12°C. Road surfaces in the surrounding area were dry. Wind speeds were around 1.4m/s. Although the plant was inaudible at the residential proxy position, plant noise levels were audible and measurable at closer distances over prevailing environmental noise.

Results and assessment

- 5.8. The specific noise level of the plant has been calculated based on close distance measurements as it was inaudible at the receiver proxy position. Corrections have been applied for distance, reflections and screening to estimate noise levels at Receptor R1 and R2. Full details of the noise measurements and calculations are detailed in [Appendix E](#).
- 5.9. The specific noise level of the plant at windows of Receptor R1 has been determined to be 16dBA daytime and 11dBA night-time, and 23dBA and 18dBA respectively at Receptor R2.
- 5.10. The plant was not observed to exhibit any tonal or impulsive characteristics. At worst, a penalty of 3dB as described in BS 4142:2014 may be applied for the possible presence of *“...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...”*.
- 5.11. Table 3 assesses the noise rating level of the refrigeration plant against the emissions criteria detailed in Table 1.

Table 3 Plant noise assessment

Receptor	Period	Plant noise rating at receptor, dB L_{Aeq}	Plant noise limit at receptor, dB L_{Aeq}	Excess, dB
R1	Daytime (07.00 – 23.00 hours)	19	40	-21
	Night-time (23.00 – 07.00 hours)	14	33	-19
R2	Daytime (07.00 – 23.00 hours)	26	40	-14
	Night-time (23.00 – 07.00 hours)	21	33	-12

Context and uncertainties

- 5.12. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessment is undertaken at the nearest residential window. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.
- The assessment has been made with the refrigeration plant operating at regular design duty (i.e. all plant on with 61% setback day/night, and gas cooler fans operating at 3.86V).
- It is understood that no noise complaints have been received since the new plant has been installed.

5.13. Where possible uncertainty in the above assessments has been minimised by taking the following steps:

- The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.
- Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method.

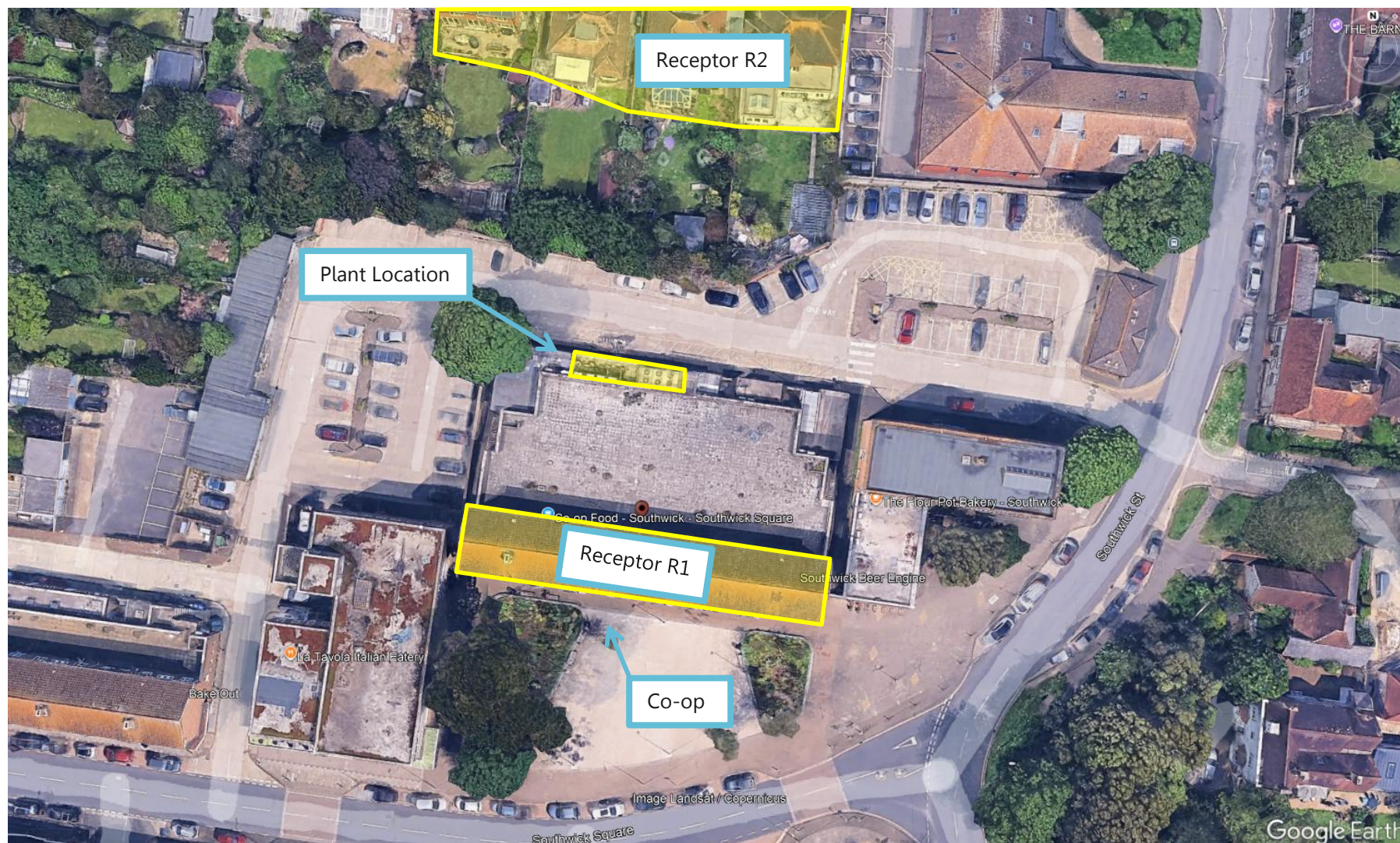
6.0 Summary

- 6.1. Noise Solutions Ltd (NSL) has been appointed to undertake commissioning sound testing for newly installed plant at the Co-operative located at 8-16 Southwick Square, Southwick.
- 6.2. It is understood that complaints were received during the operation of the previous plant, although no complaints have been received since the new plant was installed.
- 6.3. Noise levels from the installed plant have been measured and assessed against the emissions criteria outlined in the original Noise Impact Assessment report.
- 6.4. The plant incident levels were inaudible at the receiver proxy position during the survey, however, calculations and subjective auditioning indicate that the plant comfortably complies with the noise emissions criteria.
- 6.5. No complaints were received regarding noise emissions from the new plant.

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



R2 Night-time	Plant noise level at source		DISTANCE		DIRECTIVITY	SCREENING	BS4142 Feature Correction (dB)	RESULTANT AT RECEPTOR (dB)
Plant	Level (dBA)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)		
ACU	0	1	40	-32	3	0	3	-
Gas Cooler	47	1	40	-32	3	0	3	21
CUMULATIVE:								21