The Co-operative
23 South Street
Tarring
BN14 7LG

Noise Impact Assessment

On behalf of

Healy's

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Executive Summary

Noise Solutions Limited has been appointed to provide a noise impact assessment for replacement refrigeration and air conditioning plant to be installed at the Co-operative Store at 23 South Street, Tarring.

It is proposed that an acoustic wall lining is fitted behind the Refrigeration Pack in order to comply with the Local Authority's noise emissions criteria.

The assessment shows that, when attenuated as described, noise from the proposed plant will comply with recognised Standards and guidance and should therefore be acceptable to the local authority.

1.0 Introduction

1.1. Noise Solutions Ltd (NSL) has been commissioned by Healy Refrigeration & Air Conditioning Services Limited to provide a noise impact assessment for replacement plant serving an existing Co-operative store located on South Street, Tarring.

1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.

1.3. A glossary of acoustic terminology is given in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

2.1. The Co-operative convenience store occupies a retail premises located at 23 South Street, Tarring. The site location is shown in **Appendix B.**

2.1. The replacement plant comprises air conditioning (AC) unit and a refrigeration gas cooler and associated compressor pack. The replacement plant will be located in a similar location to the existing plant, with the gas cooler and AC unit located externally on the western portion of the roof, and the refrigeration pack situated at ground for level in the rear service yard off of St Dunstan's Road. Acoustic wall lining will be installed to reduce reflections.

2.2. Noise data for the proposed plant is given in **Appendix D**. The AC unit will operate only when the store is trading. The refrigeration plant may operate at any time.

3.0 Nearest noise sensitive receptors

3.1. The area surrounding the site is predominantly residential in nature. The nearest noise sensitive property to the plant location will be the top floor flat located at 21 South Street, receptor R1, approximately 8m away from the AC units, 10m away from the gas coolers, and 18m and screened from the refrigeration pack. Receptor R2 is 2 St Dunstan's Road, which will have full line of sight to the plant area, approximately 19m from the AC units, 11m from the gas coolers, and 8m from the refrigeration pack.

3.2. **Appendix B** contains an aerial photograph showing the site and surrounding area.

4.0 Existing noise climate

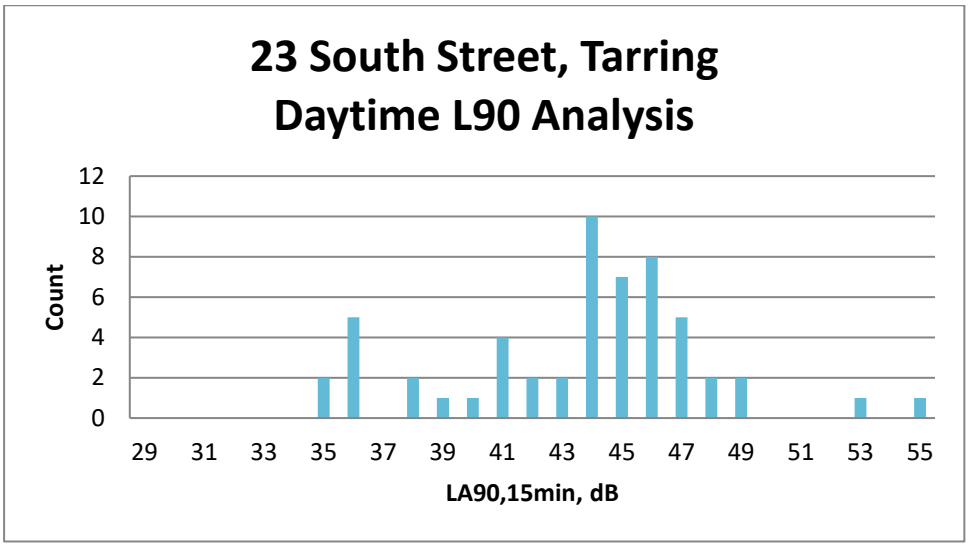
4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.

4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in **Appendix C**.

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	$L_{Aeq(15mins)}$	$L_{Amax(15mins)}$	$L_{A10(15mins)}$	$L_{A90(15mins)}$
Daytime (07.00 – 23.00 hours)	53-69	74-94	51-71	35-55
Night-time (23.00 – 07.00 hours)	32-63	51-82	32-67	29-42

Figure 1 Histogram of daytime L_{A90} background sound pressure levels



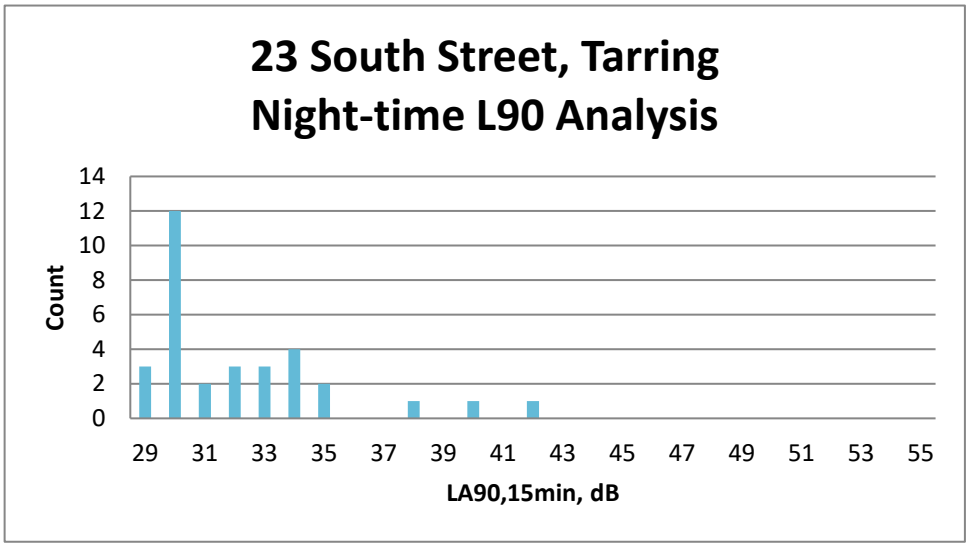
4.3. Additional statistical analysis has been undertaken. As shown in Table 2, the mean, median, and modal values have been calculated:

Table 2 Statistical analysis of $L_{A90,15min}$ levels during the daytime period

dB, L_{A90} daytime period	
Mean	44
Median	44
Mode	44

4.4. The mean, median and modal values are all 44dB L_{A90}. From review of the graph in Figure 1, 38dB L_{A90} will be used as representative of the typical free-field background sound level during the daytime period.

Figure 2 Histogram of night-time L_{A90} background sound pressure levels



4.5. Additional statistical analysis has been undertaken. As shown in Table 3, the mean, median, and modal values have been calculated:

Table 3 Statistical analysis of $L_{A90,15min}$ levels during the night-time period

dB, L_{A90} night-time period	
Mean	32
Median	30
Mode	31

4.6. From review of the graph in Appendix C 30dB L_{A90} has been considered as representative of the existing free-field background sound pressure level during the night-time period.

4.7. The following values, therefore, are considered as representative of the existing free-field background sound pressure levels at nearby noise sensitive premises:

- 38dB L_{90} during the daytime period; and
- 30dB L_{90} during the night-time period

5.0 Plant noise design criteria

Worthing Borough Council noise criteria

5.1. The Planning Noise Advice Document for Sussex, which has been adopted by Worthing Borough Council, 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*

5.2. It is assumed that the area is not subject to noise creep and therefore meeting the normal criteria will be acceptable.

5.3. The Planning Noise Advice Document for Sussex outlines BS 4142:2014+A1:2019 as the standard to assess the potential impact for noise from plant.

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

5.4. 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 4142:2014+A1:2019 includes *"sound from fixed plant installations which comprise mechanical and electrical plant and equipment"*.

5.5. The procedure contained in BS 4142:2014+A1:2019 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 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.

5.6. 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.

5.7. 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."*

5.8. 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."*

5.9. 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.*

5.10. 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."*

5.11. 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."*

5.12. 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."

5.13. BS 4142:2014+A1:2019 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.

National Planning Policy Framework

5.14. A new edition of the NPPF was published in December 2024 and came into effect immediately. The original National Planning Policy Framework (NPPF[1]) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The December 2024 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2024 edition.

5.15. Paragraph 187 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability."*

5.16. The NPPF goes on to state in Paragraph 198:

"*planning policies and decisions should ...*

a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason ...

5.17. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE[2]).

5.18. Paragraph 2 of the NPPF states that *"planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise."*

5.19. Paragraph 12 of the NPPF states that *"The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision*

[1] National Planning Policy Framework, DCLG, March 2012
[2] Noise Policy Statement for England, DEFRA, March 2010

making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed".

5.20. Paragraph 124 states that *"Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land".*

Proposed criteria

5.21. It is proposed that the rating level of the plant should be no higher than the existing background noise level at the receptor, in order to be classified as low impact when assessed against BS 4142:2014.

5.22. The cumulative rating noise level for the proposed plant at the nearest residential windows should not therefore exceed the limits shown in the table below:

Table 4 Proposed plant noise emissions level limits at noise sensitive residential receptors

Period	Cumulative plant rating noise level, dB(A)
Daytime (07.00 – 23.00 hours)	38
Night-time (23.00 – 07.00 hours)	30

5.23. The above limits have not been approved by the local authority at this stage.

6.0 Plant noise assessment

6.1. The plant noise levels at the nearest noise sensitive receptor and the site boundary have been predicted. The assessment has considered distance losses and surface acoustic reflections from the store building.

6.2. It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained. All proposed plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems. The plant is also not expected to contain any significant low frequency tones, as stated in BS 4142:2014. 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..."*.

6.3. The calculations allow for the inclusion of an acoustic wall lining behind the Pack in order to meet the council's criteria.

6.4. Table 5 summarises the results of the assessment at the most affected residential properties. All other nearby receptors benefit from increased distance/screening to the plant. The full set of calculations can be found in **Appendix E**.

Table 5 Plant noise assessment

Receptor	Period	Plant noise level at receptor, dB L_{Aeq}	Plant noise limit at receptor, dB L_{Aeq}	Excess, dB
R1	Daytime (07.00 – 23.00 hours)	38	38	0
	Night-time (23.00 – 07.00 hours)	23	30	-7
R2	Daytime (07.00 – 23.00 hours)	33	38	-5
	Night-time (23.00 – 07.00 hours)	29	30	-1

6.5. The assessment shows that noise from the plant is equal to or below the proposed criteria and would be below the level at which a "low impact" would be expected, when assessed using the methodology in BS 4142:2014. The assessment demonstrates compliance with the local authority's requirements and, therefore, the proposals should be acceptable to them in terms of noise.

Context and uncertainties

6.6. 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 all plant operating at maximum capacity, as this is not always the case, the assessment is an absolute worst-case scenario.

6.7. 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 using a well-established calculation method.
- Care was taken to ensure that the measurement positions were representative of the noise climate outside the nearby residential dwellings and not in positions where higher noise levels were present.

7.0 Summary

7.1. Noise Solutions Ltd (NSL) has been commissioned to provide a noise impact assessment for new plant serving the existing Co-operative store at 23 South Street, Tarring.

7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at a location representative of the noise climate outside the nearest noise sensitive receptors to the plant area.

7.3. With the inclusion of an acoustic wall lining behind the Pack, the assessment shows that noise from the proposed plant will comply with recognised Standards and guidance and should therefore be acceptable to the local authority.

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 s1 and s2 is given by 20 $\log_{10}$ (s1/s2). 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 20μPa. 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



Photograph 1 Courtesy of Google Earth

Appendix C Environmental sound survey

Details of environmental sound survey

C.1 Measurements of the existing environmental sound levels were undertaken between 11:45 hours on Monday 3rd February and 10:00 hours on Tuesday 4th February 2025.

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 consecutive fifteen-minute sample periods for the duration of the survey.

Measurement position

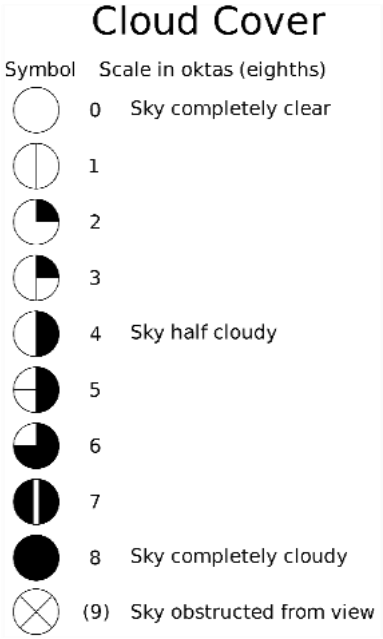
C.3 The representative measurement position was located on a lamppost along Cavendish Road (location indicated on the site plan in Appendix B). In accordance with BS 7445-2:1991 *'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*, the measurements were undertaken under free-field conditions.

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.

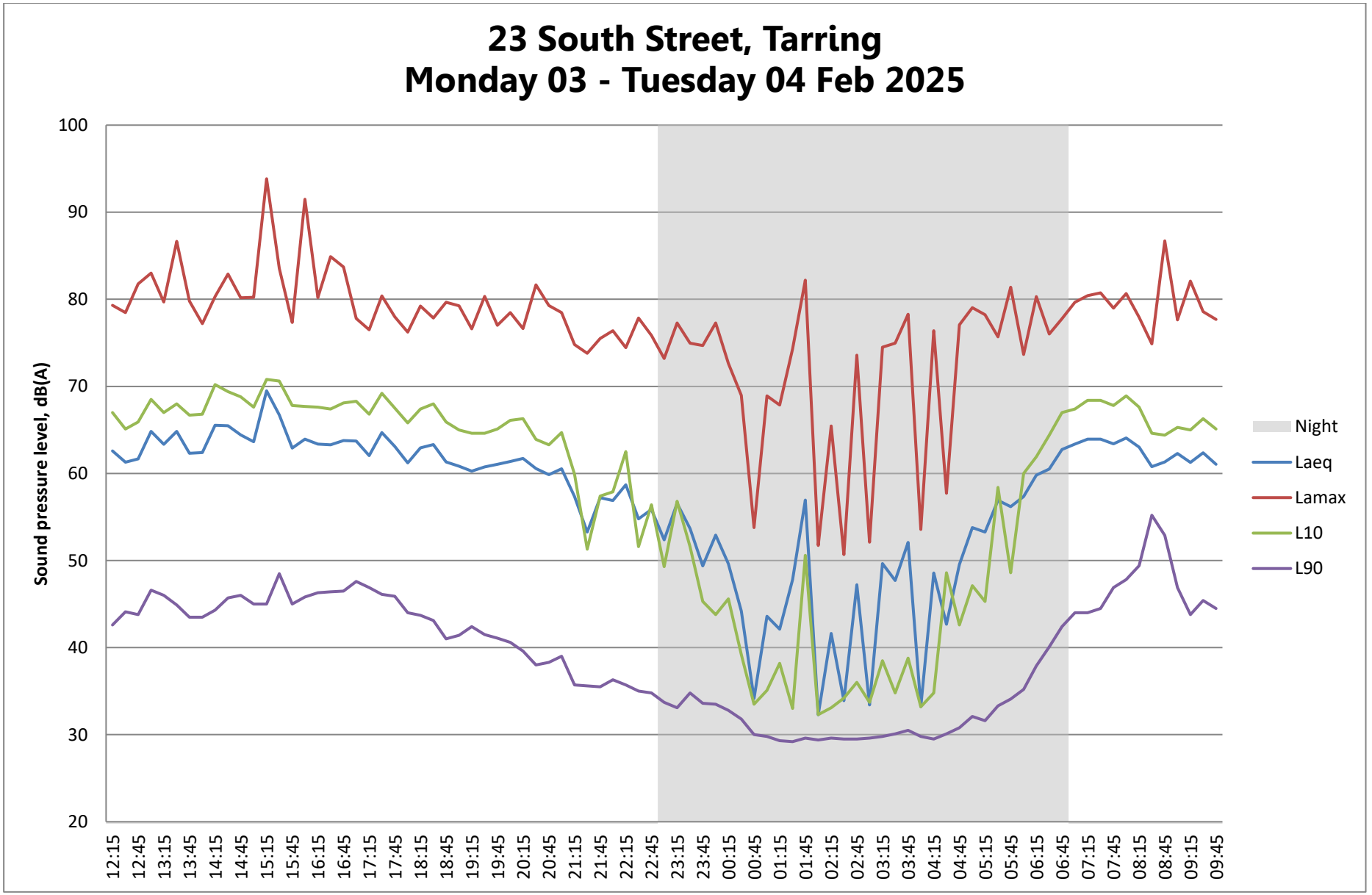
Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977D / 99070	29/01/2025	Factory conformation certificate
Condenser microphone	Microtech MK255 / 25429		
Preamplifier	Svantek SV12L / 126981		
Calibrator	Rion NC-74 / 35094453	03/09/2024	1509491-1

C.5 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	**Time/Date**	**Description**	**Beginning of Survey**	**End of Survey**
As indicated on Appendix B	11.45 3 Feb 2025 - 10.00 4 Feb 2025	Temperature (°C)	9	8
		Precipitation:	N	N
		Cloud cover (oktas – see guide)	8	8
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	Damp Ground	Damp ground
		Wind Speed (m/s)	2.2	2.3
		Wind Direction	From North-West	From North-East
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

C.6 The results of the survey are considered to be representative of the background sound pressure levels at the façades of the most affected noise sensitive receptors to the plant area during the quietest times at which the plant will operate. The noise climate at the measurement position was dominated by local and distant road traffic. The results of the survey are presented in a time history graph overleaf.


23 South Street, Tarring
Monday 03 - Tuesday 04 Feb 2025
Sound pressure level, dB(A)
100
90
80
70
60
50
40
30
20
12:15
12:45
13:15
13:45
14:15
14:45
15:15
15:45
16:15
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03:15
03:45
04:15
04:45
05:15
05:45
06:15
06:45
07:15
07:45
08:15
08:45
09:15
09:45
Night
Laeq
Lamax
L10
L90

Appendix D Plant noise data

Plant Ref	Make/ Model	Operating Hours	Sound pressure level
Gas Cooler	GFHA1.2-123AMg-EC63.H3-375	Day and night	20 dBA at 10m
Pack	Hubbard 2A-2M-ELN	Day and night	20 dBA at 10m
ACU1-2	Mitsubishi PUZ-ZM125YDA	Day	50 dBA at 1m

Appendix E Plant noise calculations

Receptor R1

Plant item	Source Sound level (dBA)	Distance		Directivity Correction (dB)	Screening (dB)	BS 4142 feature correction (dB)	Plant rating level at receptor L_{Aeq} (dB)
		Distance to Receptor (m)	Correction (dB)				
ACU1	50 at 1m	8	-18	0	0	3	35
ACU2	50 at 1m	8	-18	0	0	3	35
Pack	20 at 10m	18	-5	3	-10	3	11
Gas Cooler	20 at 10m	10	0	0	0	3	23
						Total plant rating level, day	**38**
						Total plant rating level, night (AC off)	**23**

Receptor R2

Plant item	Source Sound level (dBA)	Distance		Directivity Correction (dB)	Screening (dB)	BS 4142 feature correction (dB)	Plant rating level at receptor L_{Aeq} (dB)
		Distance to Receptor (m)	Correction (dB)				
ACU1	50 at 1m	17	-25	0	0	3	28
ACU1	50 at 1m	17	-25	0	0	3	28
Pack	20 at 10m	8	2	3	0	3	28
Gas Cooler	20 at 10m	11	-1	0	0	3	22
Total plant rating level, day							**33**
Total plant rating level, night (AC off)							**29**