

Lloyds
1 West Street
Horsham
RH12 1PA

**Plant Noise
Impact Assessment**

On behalf of



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1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned to provide a noise impact assessment for proposed replacement plant serving an existing Lloyds bank located at 1 West Street, Horsham.
- 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. Cumulative plant noise emission levels for the proposed plant have been predicted at the most affected noise sensitive receptors and assessed against the local authority's requirements.
- 1.4. 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 www.acoustic-glossary.co.uk.

2.0 Details of development proposals

- 2.1. The Lloyds bank is located along West Street, Horsham.
- 2.2. The bank comprises a three-storey commercial unit. It is understood that the proposed external plant will be installed in the same location as the existing plant.
- 2.3. The replacement plant is to comprise of 1no. air-handling unit (AHU) and 5no. air-conditioning (AC) condensing units. The proposed plant will operate only during bank opening hours.
- 2.4. A site plan showing the site and surrounding area and the noise monitoring location used in this assessment is presented in [Appendix B](#). Manufacturer's plant noise data is given in [Appendix D](#).

3.0 Nearest noise-sensitive receptors

- 3.1. The area surrounding the bank is predominantly commercial in nature. The nearest residential dwellings are the flats on West Street (Receptor R1) and the houses on Black Horse Way (Receptor R2), approximately 8m and 25m away from the plant area respectively.
- 3.2. All other properties in the area are further from the plant area, and many are screened by buildings.
- 3.3. An aerial photograph showing the site and receptor locations is presented in [Appendix B](#).

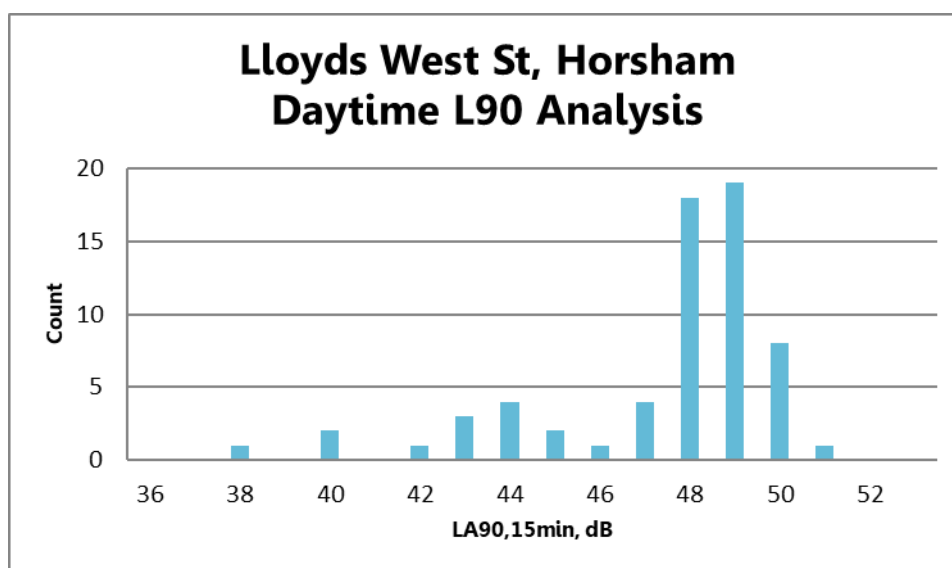
4.0 Existing noise climate

- 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)	47-57	62-85	49-59	38-51
Night-time (23.00 – 07.00 hours)	38-57	52-78	38-62	34-49

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



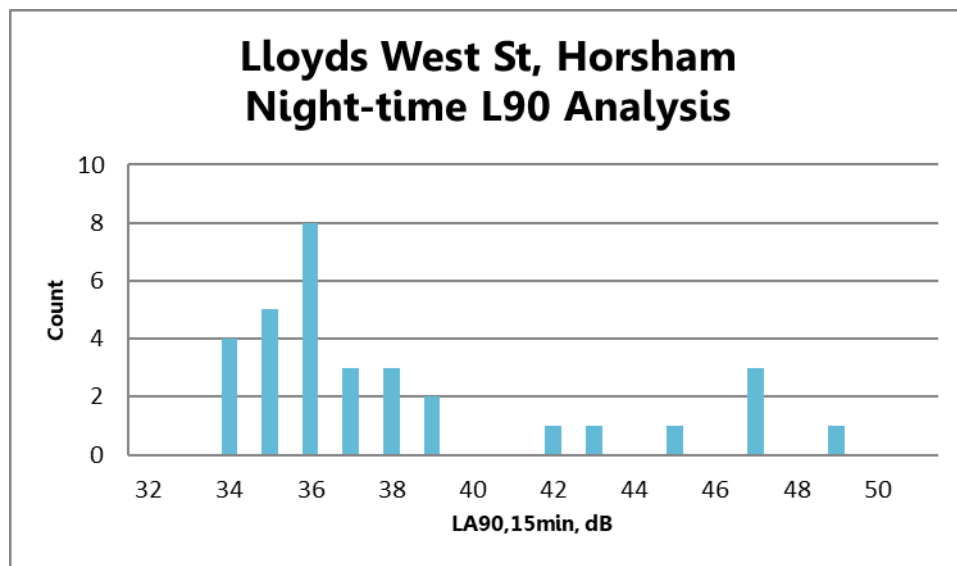
- 4.3. Further statistical analysis has been carried out on the data; the mean, modal and median values are shown in Table 2 below.

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

dB, L _{A90} daytime period	
mean	47
modal	49
median	48

- 4.4. From the histogram analysis, 48dB has been selected to be a robust representation of the background noise level during the daytime period.

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



- 4.5. Further statistical analysis has been carried out on the data; the mean, modal and median values are shown in Table 3 below.

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

dB, L_{A90} night-time period	
mean	38
modal	36
median	36

- 4.6. From the histogram analysis, 34dB has been selected to be a robust representation of the background sound level during the night-time period.

Summary

- 4.7. Therefore, the following values are considered to be the representative existing background sound pressure levels at nearby noise sensitive premises:
- 48dB L_{A90} during the daytime period; and
 - 34dB L_{A90} during the night-time period.

5.0 Noise criteria

National Planning Policy Framework

- 5.1. A new edition of the NPPF was published in December 2024 and came into effect immediately, with corrections published in February 2025. The original National Planning Policy Framework (NPPF¹) 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/February 2025 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2024/ February 2025 edition.
- 5.2. 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, air, water or noise pollution or land instability."*
- 5.3. 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 ...*
- 5.4. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE²).
- 5.5. Paragraph 2 of the NPPF states that *"planning law requires that applications for planning permission be determined in accordance with the development plan unless material considerations indicate otherwise."*
- 5.6. 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 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-*

¹ National Planning Policy Framework, DCLG, March 2012

² Noise Policy Statement for England, DEFRA, March 2010

date development plan, but only if material considerations in a particular case indicate that the plan should not be followed”.

- 5.7. 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”.*

Horsham District Council

- 5.8. It is understood that Horsham District Council has adopted The *Planning Noise Advice Document: Sussex*³.
- 5.9. The *Planning Noise Advice Document: Sussex*, provides the following advice with regard to industrial and commercial sound sources.

The rating level of the industrial or commercial sound source should, where practicable, achieve a level no greater than the representative background sound, when measured in accordance with BS 4142:2014 + A1: 2019. There may be instances, for specific sites, where a rating level below background is deemed appropriate. This can be determined through discussion with the Local Planning Authority (LPA). A rating level below background may be required if there are concerns for potential noise creep, for example in a High Street setting. It is considered that meeting this criterion 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. At all times the reports shall have regard to the context.

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

- 5.10. 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”.*
- 5.11. 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.

³ Planning Noise Advice Document: Sussex, March 2021

- 5.12. 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.
- 5.13. 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."*
- 5.14. 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."*
- 5.15. 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.*
- 5.16. 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."*
- 5.17. 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."*
- 5.18. 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."

- 5.19. 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.

Summary of criteria

- 5.20. In line with the local council's criteria, the plant noise Rating Level at nearby residential properties should not exceed the representative L_{A90} level. According to the method described in BS 4142:2014+A1:2019 this would result in, at worst, a "low impact".
- 5.21. The proposed limits are therefore as shown in Table 4 below.

Table 4 Proposed plant sound level limits at nearest receptors

Receptor	Period	Cumulative plant rating level, dB(A)
Residential	Daytime (07.00 – 23.00 hours)	48

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

6.0 Plant noise impact assessment

- 6.1. The cumulative plant noise level at the most affected noise sensitive receptor has been predicted based on manufacturer's noise data for the proposed equipment. The assessment has taken into consideration distance attenuation, screening and directivity. Any retained plant is assumed to have planning permission in place and is out of the scope of this report.
- 6.2. 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. To provide a robust assessment, a 3dB acoustic feature correction as described in BS 4142:2014+A1:2019 has been included for the residential receptors for the possible presence of "...characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...".
- 6.3. Table 5 summarises the results of the assessment at the most affected properties. All other nearby receptors benefit from increased distance/screening to the plant such that resulting

noise levels will be lower than at the receptors considered. The full set of calculations can be found in [Appendix D](#).

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

Receptor	Period	Cumulative plant noise rating level, dB(A)	Proposed design criterion (dB)	Difference
R1	Daytime (07.00 - 23.00 hours)	47	48	-1
R2	Daytime (07.00 - 23.00 hours)	42	48	-6

- 6.4. The assessment shows that the cumulative plant noise levels will comply with the proposed criteria.

Context and uncertainties

- 6.5. 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 windows. The impact on all other nearby windows will be lower due to screening and distance attenuation.
- The noise level predictions are based on the proposed equipment running simultaneously at maximum duty. The plant will not run in this manner at all times and, therefore, this is a robust assessment.

- 6.6. Where possible uncertainty in this assessment has been minimised by taking the following steps:

- The measurement of the background sound levels was undertaken over a period including the quietest times of the day and night.
- The sound level meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.
- Uncertainty in the calculated impact has been reduced by the use of a well-established calculation method.

Care was taken to ensure that the measurement position was representative of the noise climate outside the nearby residential dwellings and not at a position where higher noise levels are present.

7.0 Summary

- 7.1. Noise Solutions Ltd (NSL) has been commissioned to provide a noise impact assessment for proposed replacement plant serving an existing Lloyds bank located at 1 West Street, Horsham.
- 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.
- 7.3. The assessment has found that the cumulative noise emissions from the proposed plant serving the store will result in no worse than a "low impact" when assessed using the methodology in BS 4142:2014+A1:2019.

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 exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B Photograph of site showing areas of interest



Photograph 1 Courtesy of Google Earth © 2026

[illegible]

Appendix C Environmental sound survey

Details of environmental sound survey

- C.1 Measurements of the existing environmental sound levels were undertaken between 12.30 hours on Thursday 19th February and 12.30 hours on Friday 20th February 2026.
- 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 roof railing on the Lloyds building. This location is approximately representative of the levels of road traffic noise at the closest receptor. The approximate location of the microphone is indicated on the plan in [Appendix B](#).
- C.4 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.5 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 971A / 124660	23/05/2025	1512162-1
Condenser microphone	ACO Pacific 7052E / 81197		
Preamplifier	Svantek SV18A / 130661		
Calibrator	Svantek SV33B / 125546	23/05/2025	1512162-2

Weather conditions

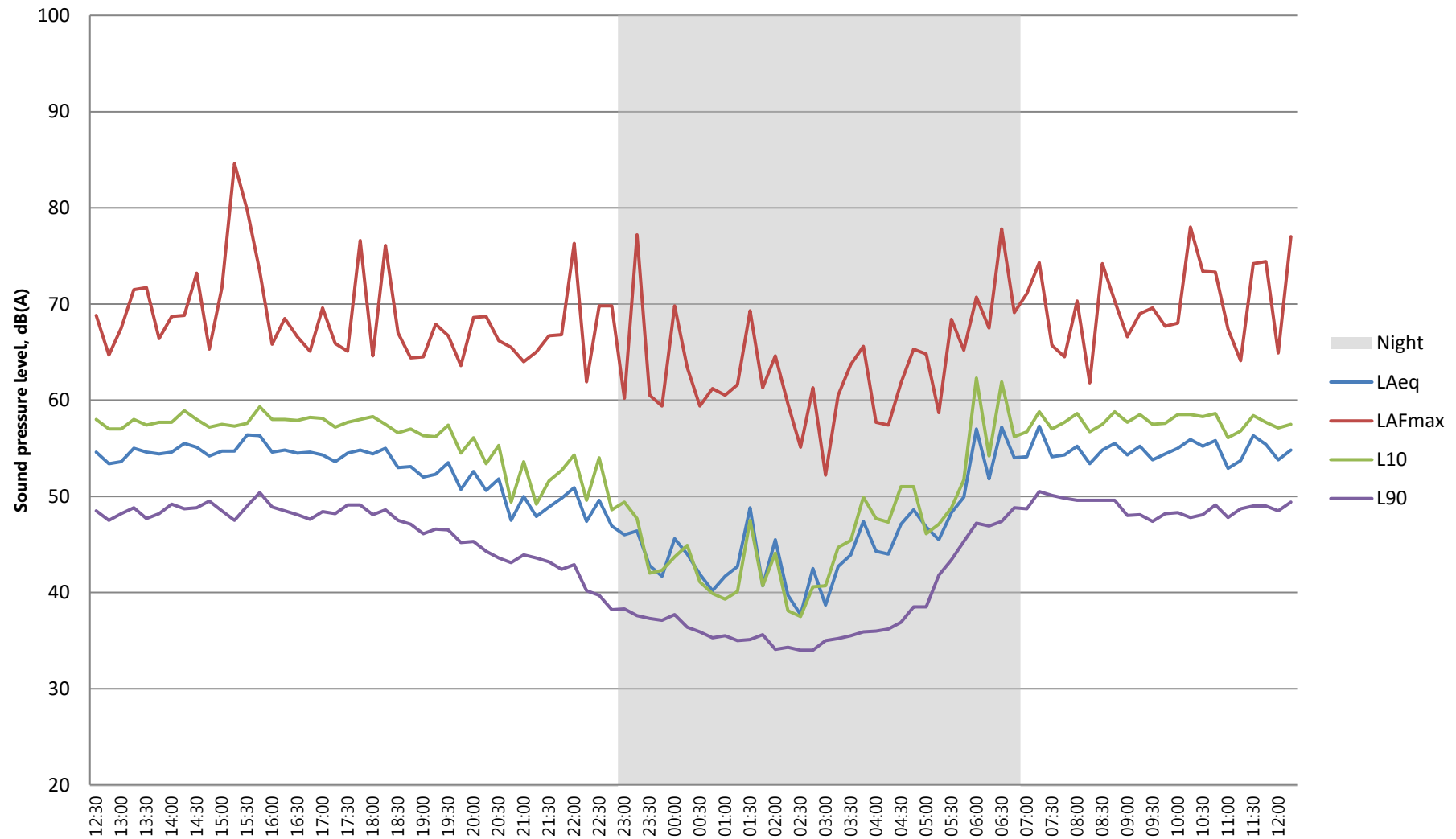
- C.6 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	Date/Time	Description	Beginning of Survey	End of Survey
As indicated on Appendix B	12.30 19 Feb - 12.30 20 Feb 2026	Temperature (°C)	4	4
Cloud Cover Symbol Scale in oktas (eighths) 0 Sky completely clear 1 2 3 4 Sky half cloudy 5 6 7 8 Sky completely cloudy (9) Sky obstructed from view		Precipitation:	No	Yes
		Cloud cover (oktas - see guide)	8	8
		Presence of fog/snow/ice	No	Ice
		Presence of damp roads/wet ground	Yes	Yes
		Wind Speed (m/s)	1.1	7.2
		Wind Direction	NW	NW
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

- C.7 The results of the environmental survey are considered to be representative of the background sound pressure levels at the façades of the nearest noise sensitive receptors during the quietest times at which the plant will operate. The predominant noise source affecting the area was local and distant traffic, although the survey period includes sufficient periods with no such activity that a robustly representative background can be determined. Plant noise was not audible at the measurement position. The results of the survey are presented in a time history graph overleaf.

Lloyds West St, Horsham Thursday 19 - Friday 20 Feb 2026



Appendix D Plant noise calculations

Manufacturer's noise data

Plant	Make / Model	No. of units	Sound Pressure Level
AHU Intake	Swegon GOLD F RX	1	49dBA Lw
AHU Exhaust	Swegon GOLD F RX	1	68dBA Lw
CON1	REYA8A9	1	58dBA @ 1m
CON2	REYA10A9	1	59 dBA @ 1m
CON3	REYA10A9	1	59 dBA @ 1m
CON4	RZAG35B	1	48 dBA @ 1m
CON5	RZAG35B	1	48 dBA @ 1m

Receptor R1 daytime

Plant	Plant noise level at source		Distance to receptor		Directivity	Acoustic Screening	BS4142 Feature	Resultant at receptor dB(A)
	Noise level, dB(A)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	Correction (dB)	
AHU Intake	49	Lw	18	-33	0	0	3	19
AHU Exhaust	68	Lw	20	-34	0	0	3	37
CON1 REYA8A9	58	1	11	-21	0	0	3	40
CON2 REYA10A9	59	1	10	-20	0	0	3	42
CON3 REYA10A9	59	1	9	-19	0	0	3	43
CON4 RZAG35B	48	1	17	-25	3	-15	3	14
CON5 RZAG35B	48	1	17	-25	3	-15	3	14
Combined rating pressure level, dB L _{Ar, 1hr}								47

Receptor R2 daytime

Plant	Plant noise level at source		Distance to receptor		Directivity	Acoustic Screening	BS4142 Feature	Resultant at receptor dB(A)
	Noise level, dB(A)	Distance (m)	Distance (m)	Correction (dB)	Correction (dB)	Correction (dB)	Correction (dB)	
AHU Intake	49	Lw	21	-34	0	0	3	18
AHU Exhaust	68	Lw	22	-35	0	0	3	36
CON1 REYA8A9	58	1	24	-28	0	0	3	33
CON2 REYA10A9	59	1	24	-28	0	0	3	34
CON3 REYA10A9	59	1	25	-28	0	0	3	34
CON4 RZAG35B	48	1	20	-26	6	0	3	31
CON5 RZAG35B	48	1	20	-26	6	0	3	31
Combined rating pressure level, dB L _{Ar, 1hr}								42