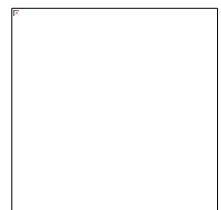


The Co-operative
Whitemans Green
Cuckfield
RH17 5BY

**Plant Noise
Guidance Report**

On behalf of



Project Reference: 93079 | Revision: 00 | Date: 11th March 2025

Document Information

Project Name : Co-op Food, Whitemans Green, Cuckfield
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For and on behalf of Noise Solutions Ltd				

Revision	Date	Description	Prepared	Reviewed/ Approved

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Contents

1.0 Introduction 2

2.0 Details of development proposals..... 2

3.0 Nearest noise sensitive receptors 2

4.0 Existing noise climate 3

5.0 Plant noise design criteria 5

 Mid Sussex District Council5

 BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.6

 Low background sound levels7

 Proposed criteria7

7.0 Summary 9

Appendices

Appendix A Acoustic terminology

Appendix B Photograph of site showing areas of interest

Appendix C Environmental sound survey

Executive Summary

Noise Solutions Limited has been appointed to provide guidance on permissible noise levels of replacement refrigeration and air conditioning plant to be installed at the Co-operative Store at Whitemans Green in Cuckfield.

Based on the information contained within this report, the following plant noise emission limits apply;

Plant	Period	Maximum plant noise emission level (L _{Aeq})
AC plant (total)	Daytime (07.00 – 23.00 hours)	51dB at 1m
	Night-time (23.00 – 07.00 hours)	Not applicable
Refrigeration Pack	Daytime (07.00 – 23.00 hours)	21dB at 10m
	Night-time (23.00 – 07.00 hours)	13dB at 10m
Gas Cooler	Daytime (07.00 – 23.00 hours)	21dB at 10m
	Night-time (23.00 – 07.00 hours)	13dB at 10m

It is noted that these are stringent limits and attenuation is likely to be required. It may be possible to relax the limits for the refrigeration plant if an absorptive acoustic wall lining is fitted to the building façade in the vicinity of the pack.

1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned by Fit Out UK to provide guidance on maximum noise emissions for replacement plant serving an existing Co-operative store located at Whitemans Green, Cuckfield.
- 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. This report contains plant noise guidance based on project information available at the time of writing and the results of a baseline noise survey.
- 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 Co-operative convenience store occupies a retail premises located at Whitemans Green, Cuckfield. The site location is shown in **Appendix B**.
- 2.2. The replacement plant will be located in a similar location to the existing plant, with the gas cooler and AC units located externally on the wall of the western lower roof, overlooking the car park, and the refrigeration pack situated at ground level in the car park. The replacement plant is expected to consist of 1No. Split AC units, 1No. gas cooler and 1No. refrigeration pack.

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 above the Co-op store, receptor R1, approximately 10m away from the AC units and 4m from the refrigeration pack and gas cooler.
- 3.2. **Appendix B** contains an aerial photograph showing the site and surrounding area, including the location of the receptors identified above.

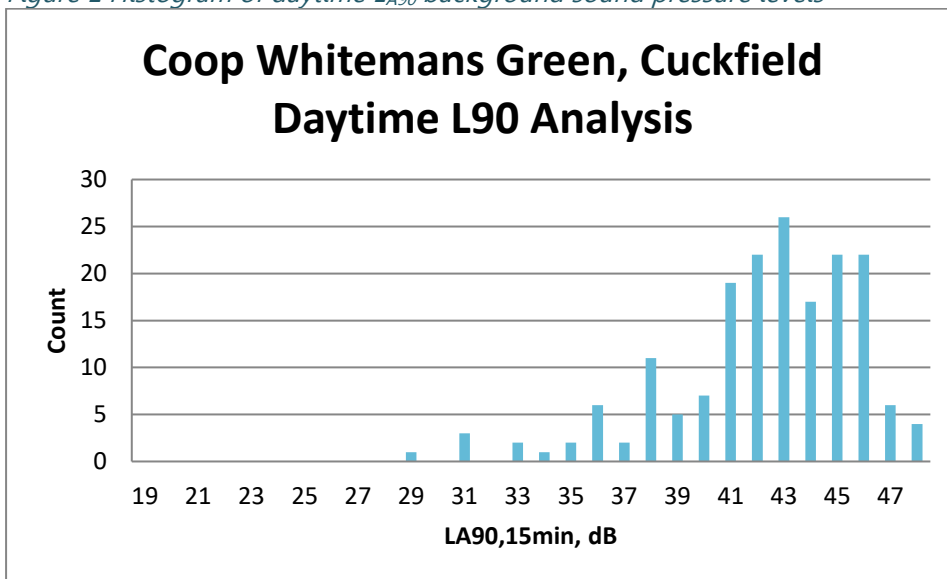
4.0 Existing noise climate

- 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, during the quietest times at which the plant will operate.
- 4.2. The results of the environmental sound survey are summarised in Table 1. 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)	40-58	54-84	45-58	29-48
Night-time (23.00 – 07.00 hours)	26-53	53-77	23-55	19-48

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



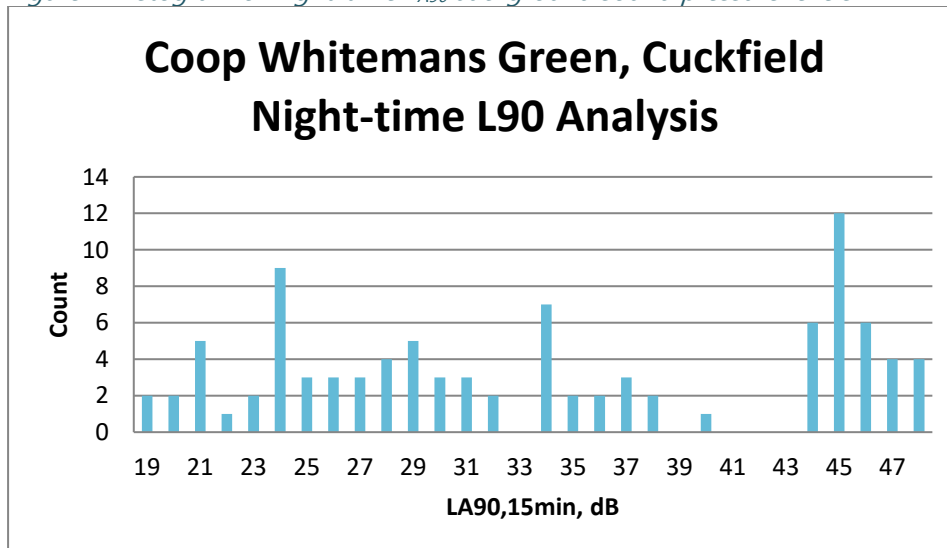
- 4.3. Additional statistical analysis has been undertaken. As shown in Table 2, the mean, median, and modal values have been calculated:

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

dB, L_{A90} daytime period	
Mean	42
Mode	43
Median	43

- 4.4. The night-time period of Sunday 24th February 2025 was heavily influenced by additional noise created by adverse weather effects, the impact of which can be seen in the figure below by the modal value being 45dB. This period has been ignored in our assessment.

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	34
Mode	45*
Median	34

4.6. Based on the histogram analyses above, the following values have been considered as representative of the existing background sound pressure levels at nearby noise sensitive premises:

- 41dB L_{A90} during the daytime period; and
- 24dB L_{A90} during the night-time period.

5.0 Plant noise design criteria

Mid Sussex District Council

5.1. The *Planning Noise Advice Document for Sussex*, which has been adopted by Mid Sussex District 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 to control noise in order to satisfy the LPA that the development is acceptable.

- 5.2. Since the proposed plant replaces existing plant, it is reasonable to assume that there is a negligible risk of 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 4142:2014¹ includes *"sound from fixed plant installations which comprise mechanical and electrical plant and equipment"*.
- 5.5. 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 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.*

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

- 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 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.

Low background sound levels

- 5.14. Due to the exceptionally low prevailing environmental noise levels measured during the survey night-time period, it is suggested that the plant noise design criteria at the nearest residences should be capped at 30dBA. This proposed criterion is based on guidance found in Section 11 of BS 4142:2014 which states:

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.

- 5.15. A plant noise level of 30dBA at the façade would result in an internal noise level of 15dBA, which is likely to be lower than self-generated noise internally (for example, from domestic refrigerators). This assumption is based on guidance found in BS 8233:2014, which states that approximately 15dB of insulation is provided by a partially open window.

Proposed criteria

- 5.16. 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.

5.17. A summary of the recommended plant noise limits is given in Table 4.

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

Period	Cumulative plant rating noise level, dB $L_{A,r,Tr}$
Daytime (07.00 – 23.00 hours)	41
Night-time (23.00 – 07.00 hours)	30

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

6.0 Outline guidance - plant noise limits

6.1. Plant details and locations are to be finalised.

6.2. Taking account of the distance between the existing plant locations and the nearest receptors, the proposed plant should not exceed the following limits to demonstrate compliance with the criteria detailed in Table 4.

Table 5 Guidance on maximum plant noise emission limits

Plant	Period	Maximum plant noise emission level (L_{Aeq})
AC plant (total)	Daytime (07.00 – 23.00 hours)	51dB at 1m
	Night-time (23.00 – 07.00 hours)	Not applicable
Refrigeration Pack	Daytime (07.00 – 23.00 hours)	21dB at 10m
	Night-time (23.00 – 07.00 hours)	13dB at 10m
Gas Cooler	Daytime (07.00 – 23.00 hours)	21dB at 10m
	Night-time (23.00 – 07.00 hours)	13dB at 10m

It is noted that these are stringent limits and attenuation is likely to be required. It may be possible to relax the limits for the refrigeration plant if an absorptive acoustic wall lining is fitted to the building façade in the vicinity of the pack.

6.3. 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.
- Care was taken to ensure that the measurement position was representative of the noise climate outside the nearby residential dwellings and not in a position where higher noise levels were present.

6.4. The following should be taken into account during the design of the plant area;

- NSL should be consulted once the exact plant layout/selection is confirmed to ensure noise requirements can be achieved.
- The local authority is anticipated to require details of the proposed plant and a noise impact assessment report as part of the planning application.

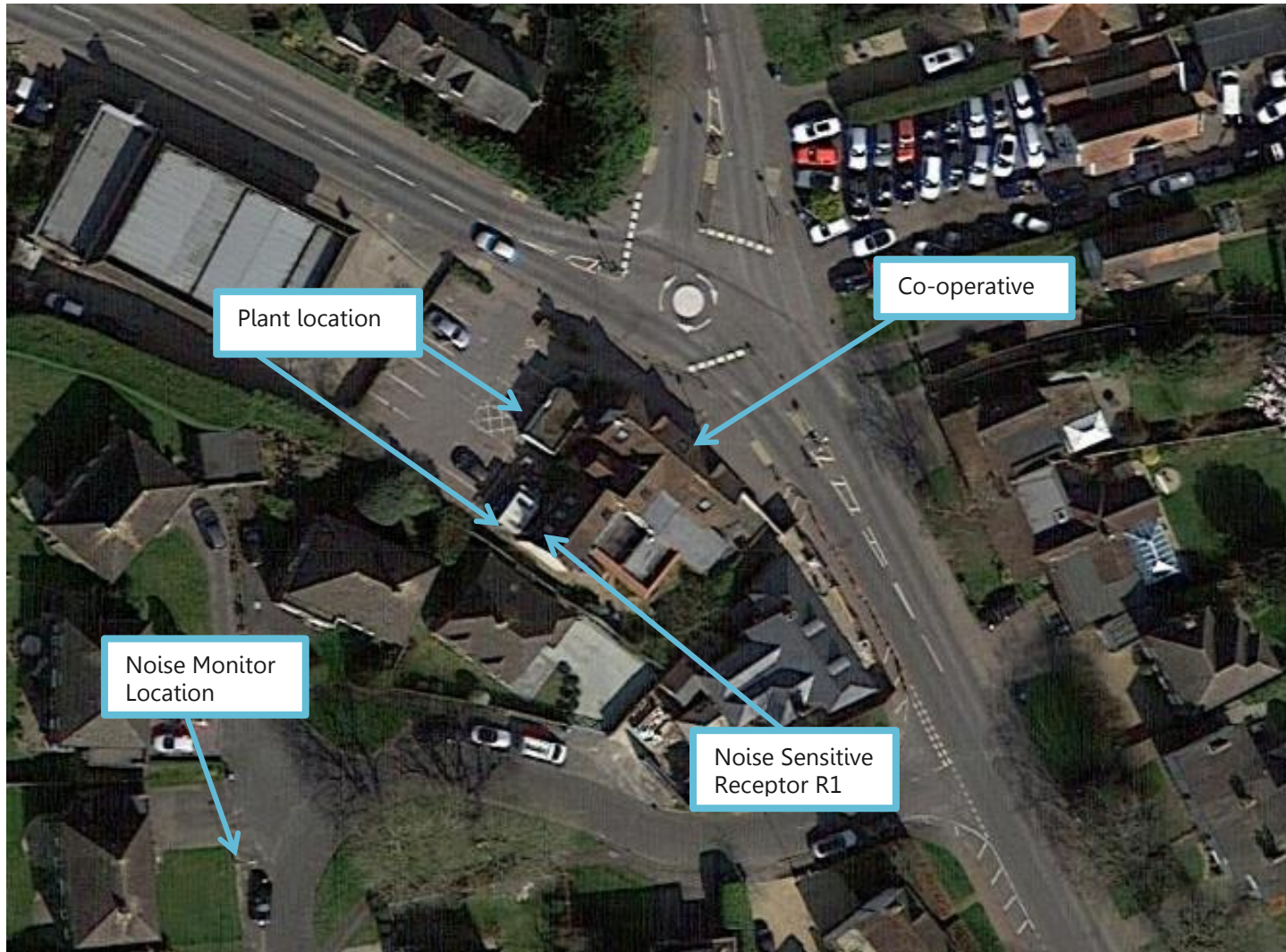
7.0 Summary

- 7.1. Noise Solutions Ltd (NSL) has been commissioned by CDS Group to provide guidance on maximum noise emissions for replacement plant serving an existing Co-operative store located on Whitemans Green, Cuckfield.
- 7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at locations representative of the noise climate outside the nearest noise sensitive receptors to the proposed plant area.
- 7.3. Guidance on the maximum noise emissions for the proposed plant has been provided. NSL should be consulted once the final layout/selections have been confirmed.

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 Environmental sound survey

Details of environmental sound survey

- C.1 Measurements of the existing environmental sound levels were undertaken between 14:00 hours on Friday 21st February and 10:00 hours on Monday 24th 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 sound level meter was positioned on a lamppost along Brock End. The approximate location of the microphone is indicated on the aerial photograph 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.

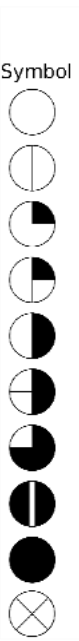
Equipment

- 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	Rion NL-52 / 00654035	06/07/2023	Factory conformation certificate
Condenser microphone	Rion UC-59 / 14826		
Preamplifier	Rion NH-25 / 87474		
Calibrator	Rion NC-74 / 34235932	09/10/2024	1509847-1

Weather conditions

- C.5 Weather conditions were determined both at the start and upon completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements.
- C.6 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)	13	11
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:	N	Light
		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)	1.2	1
		Wind Direction	South	South
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

- C.7 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.
- C.8 The noise climate at the measurement position was dominated by nearby road traffic with influence to a lesser degree from distant traffic, aircraft, birdsong, pedestrians, and rustling leaves. The results of the survey are presented in a time history graph overleaf.

Coop Whitemans Green, Cuckfield

Friday 21 - Monday 24 Feb 2025

