Noise Addendum Report

Acorn AD Plant, Spring Grove Green

Acorn Bioenergy Limited

Prepared by:

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Basis of Report

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1.0 Introduction

This report has been prepared as an addendum to the original Noise chapter of the Environmental Impact Assessment ('The Noise Chapter') prepared in relation to the proposed new Anaerobic Digestion plant ('The Proposed Development') at the land at Thurlow Estate, Haverhill, Suffolk ('The Site')

This addendum covers the following aspects as per the Regulation 25 Request:

- An assessment of cumulative noise impacts in relation to the current application CC/23/110/FUL '*Land at Streetly Hall Farm'* under consideration by Cambridgeshire County Council ('The Cumulative Development').

Reasonable effort has been made to ensure that this report is easy to understand for the general public, however it is technical in nature. For the assistance in reading by non-technical readers, a glossary of terminology has been included in **Appendix A**. A statement of the competence of the consultants associated with this assessment constituting a Suitability Qualified Acoustician (SQA) is provided in **Section 4.0**.

2.0 Cumulative Assessment of Noise

An assessment of the cumulative noise impacts of The Proposed Development and those detailed within application CC/23/110/FUL is provided in this section.

2.1 Method

Calculations are undertaken to determine the noise levels at the identified receptors nearby The Site as a result of the cumulative sum of operational activities, and construction activities associated with The Proposed Development and The Cumulative Development.

The calculations consider the change in noise levels at the identified receptors for the following scenarios:

- Daytime operational activities
- Night time operational activities
- Construction activities

Where more than one scenario are presented for each operational or construction phase of the development, the worst case is considered.

The calculations are based on a conservative approach, for robustness, utilising the following principle:

$$L_2 = L_1 + 20 \times \log_{10}\left(\frac{R}{R_0}\right)$$

- Where:
  - L_2 is the calculated noise level at the receptor location.
  - L_1 is the calculated noise level at a reference location.
  - R is the propagation distance (in metres) between a source and the receptor location.
  - R_0 is the reference distance (in metres) between the source and the reference location.

The noise levels calculated at the receptor locations resulting from The Cumulative Development are logarithmically summed with those from The Proposed Development to determine the cumulative effects of both developments, if any.

In this instance, the receptor locations are those set out in **Section 2.2**, the reference locations are the relevant receptor identified for assessment in relation to The Cumulative Development, and the source is The Cumulative Development.

The boundary of The Cumulative Development has been defined as the source location, and the calculations assume direct line of sight between the source and receptor, and therefore no additional losses for screening. This represents a robust approach, as it will tend to underpredict the losses between the source and receptor.

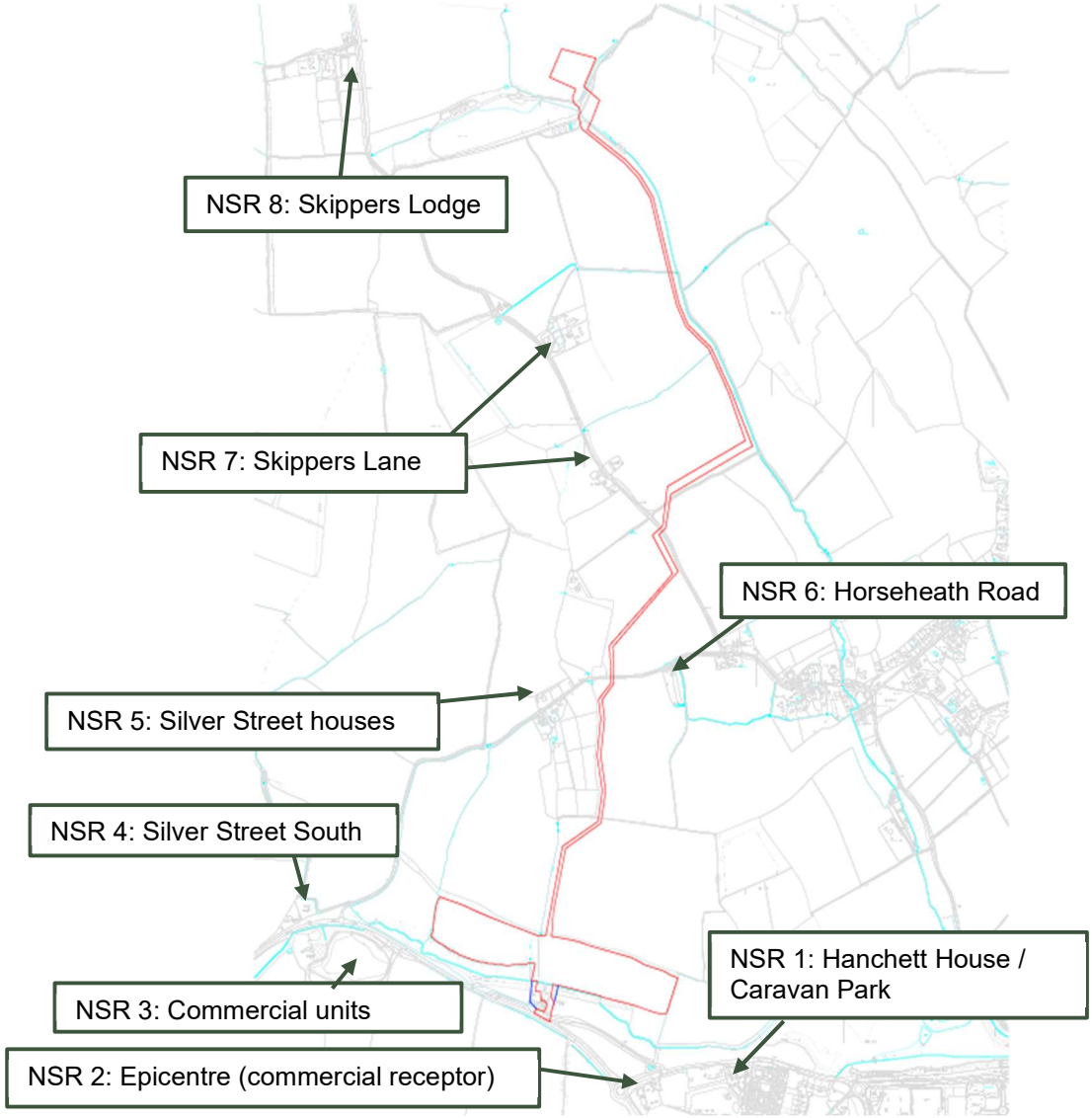
The methods to determine the significance of effect within this section are as per those set out in The Noise Chapter. However, this document is intended to be concise and for ease of reading by the general public. As such, where calculations indicate there to be no change in noise levels (<0.1 dB) at a receptor, the outcomes are simply referred back to those determined in The Noise Chapter.

2.2 Receptors

The receptors considered as part of this assessment are as per those set out in The Noise Chapter. For ease of reference, these are listed below and shown on **Figure A**:

- NSR 1: Hanchett House (residential receptor, noise sensitive at all times);
- NSR 2: Epicentre (commercial receptor, noise sensitive during daytime);
- NSR 3: Commercial units west (noise sensitive during daytime);
- NSR 4: Silver Street west (residential receptor, noise sensitive at all times);
- NSR 5: Silver Street Houses (residential receptor, noise sensitive at all times);
- NSR 6: Horseheath Rd (Phase 4 pipeline construction only);
- NSR 7: Skippers Lane (Phase 4 pipeline construction only); and
- NSR 8: Skippers Lodge (Phase 4 pipeline construction only).

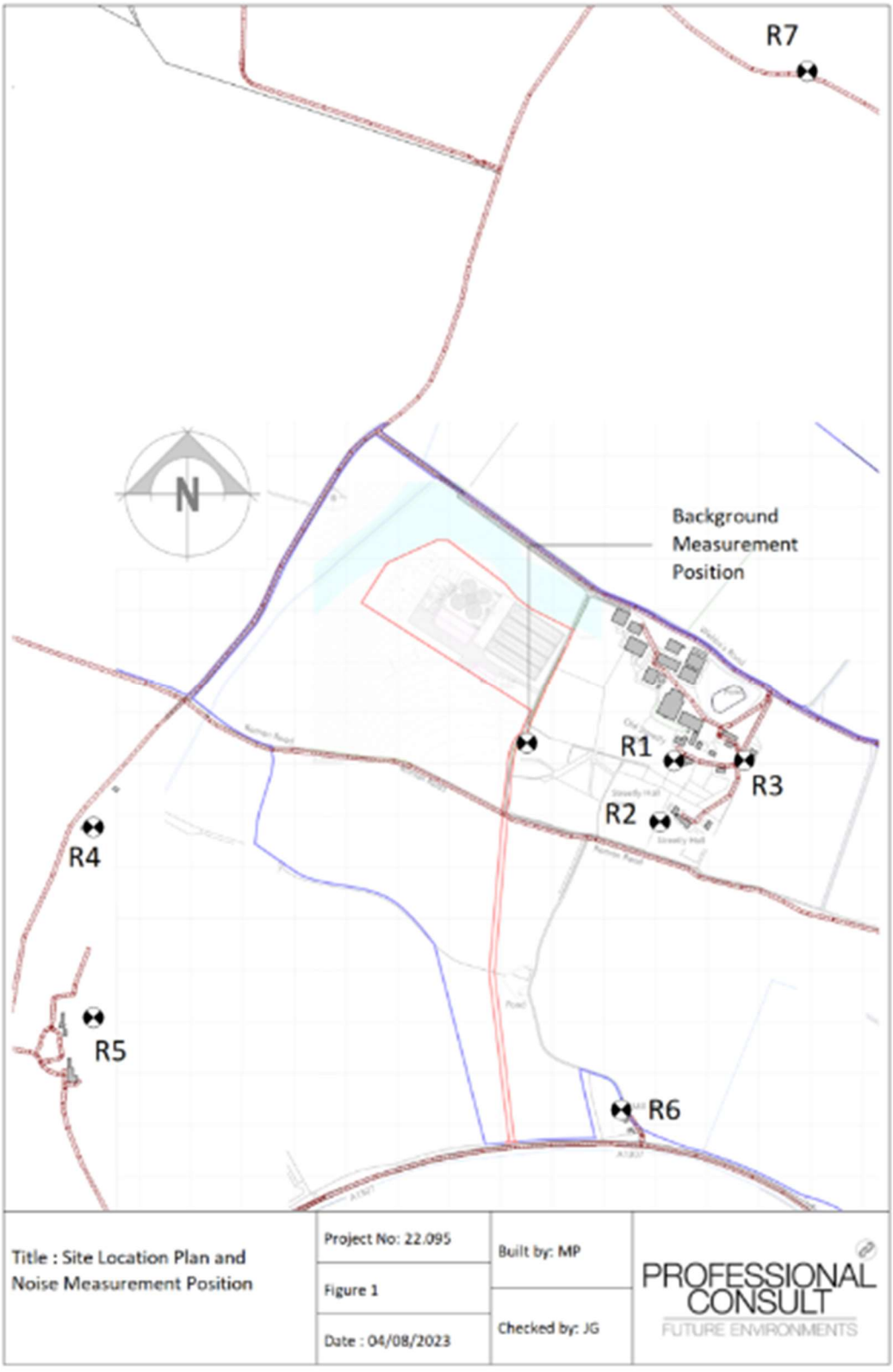
Figure A: Noise-Sensitive Receptor Locations



2.3 Reference Locations

The reference locations are defined as the receptor locations identified in The Cumulative Development. For ease of reference, these are reproduced from The Cumulative Development Noise Chapter in **Figure B**.

Figure B: Reference Locations



For the purposes of the calculations presented in Section 2.4, it is necessary to determine the most relevant reference location from which the propagation losses to the receptor locations are calculated. Ideally, the reference location would be positioned between The Cumulative Development and The Site (i.e. a simple extension of the noise propagation path), and as best as possible along a line of best fit between The Cumulative Development and the receptor location. On this basis, the following reference locations have been considered most suitable for each receptor location:

- Receptor locations 1 to 7 – Reference location 2.
- Receptor location 8 – Reference location 7.

It is acknowledged that there are primary mitigation measures at The Cumulative Development in the form of barriers which control sound transmission to the reference locations to the east of The Cumulative Development (reference locations 1-3). However, on balance, the receptor locations will also benefit from these primary mitigation measures and so the selected reference locations are considered appropriate.

2.4 Calculations

As per the methodology set out in **Section 2.1**, calculations are presented in the following tables. The reference source levels (L_1) are taken from Table 13 (operational noise) and Table 21 (construction noise) of the Cumulative Development Noise Chapter (Ref '*22.095.1.R2'* as written by Professional Consult dated 4th August 2023).

Table A: Reference Distances (R_0), and Reference Source Levels (L_1)

Reference Location	R_0: Distance from Reference Location to Cumulative Development boundary, m	L_1:		
		Maximum Predicted Operational Noise ($L_{Aeq,T}$), dB		Maximum Predicted Construction Noise Level, $L_{Aeq,10hour}$
		Day	Night	
2	365	21.4	20.5	66.3
7	1270	16.2	15.1	55.1

Table B: Propagation Distances (R) and Calculated Losses to Receptor Locations

Receptor Location	R: Distance from Receptor Location to Cumulative Development boundary, m	Relevant Reference Location from which to Calculate Propagation Losses	Calculated Propagation Losses between Cumulative Development and Receptor Location
1	4,950	2	22.6
2	4,700	2	22.2
3	3,650	2	20.0
4	3,500	2	19.6
5	4,050	2	20.9
6	4,450	2	21.7
7	4,020	2	20.8
8	3,500	7	8.8

Based on the calculated propagation losses between The Cumulative Development and the Receptor Locations, the operational noise levels have been calculated, as presented in **Table C**.

Table C: Operational Phase Calculated Cumulative Noise Level (L_2)

Receptor Location	Period	Calculated L_2 from:		
		The Proposed Development (values taken from Table 18 of The Noise Chapter)	The Cumulative Development	Logarithmic Sum of L_2 from both developments
1	Daytime	31.0	-1.2	31.0
	Night Time	34.0	-2.1	34.0
2	Daytime	33.0	-0.8	33.0
3	Daytime	31.0	1.4	31.0
4	Daytime	29.0	1.8	29.0
	Night Time	30.0	0.9	30.0
5	Daytime	29.0	0.5	29.0
	Night Time	30.0	-0.4	30.0

It can be seen from **Table C** that there will be no increase in the sum of operational noise levels from both developments. Furthermore, the calculated noise levels from The Cumulative Development are at least 27 dB below those from The Proposed Development. This would indicate that no attention catching features would be present at the receptor locations from operational noise associated with The Cumulative Development, and therefore no character corrections would apply here. As such, the BS4142 assessment of Operational Noise presented in The Noise Chapter remain applicable, including all outcome effects.

Table D presents the construction phase noise levels from the cumulative sum of both developments.

Table D: Construction Phase Calculated Cumulative Noise Level (L_2)

Receptor Location	Calculated L_2 from:			Limits
	The Proposed Development (values taken from Table 16 of The Noise Chapter)	The Cumulative Development	Logarithmic Sum of L_2 from both developments	
1	42	43.7	45.9	65.0
2	45	44.1	47.6	65.0
3	46	46.3	49.2	65.0
4	44	46.7	48.5	65.0
5	65	45.4	65.0	65.0
6	58	44.6	58.2	65.0
7	65	45.5	65.0	65.0
8	53	46.3	53.8	65.0

It can be seen from **Table D** that the logarithmic sum of noise from both developments does increase relative to those during just The Proposed Development, in most cases. However, in all instances, the logarithmic sum of the noise level from both developments remains at, or below the construction noise limits. This indicates that although the levels may increase in

some cases, this will not change the intrusiveness of the noise at the receptor location(s) and therefore the cumulative effects of construction noise from both developments will not change.

As such, there are no material changes to the outcomes set out in The Noise Chapter.

3.0 Conclusions

This report has been prepared as an addendum to the original Noise chapter of the Environmental Impact Assessment for the Proposed Development to address the following Regulation 25 Request :

- An assessment of cumulative noise impacts in relation to the current application CC/23/110/FUL '*Land at Streetly Hall Farm'* under consideration by Cambridgeshire County Council.

An assessment methodology is proposed, for which the basis is the original methodology set out in The Noise Chapter. As this addendum is addressing cumulative impacts, an additional supplementary methodology is proposed to allow calculations to be undertaken accordingly, namely to calculate propagation effects from noise sources associated with the cumulative development.

The proposed methodology is considered robust, as it does not account for several sound propagation losses that are likely to exist in reality.

The results of the calculations indicate that:

- The BS4142 assessment of Operational Noise presented in The Noise Chapter remain applicable, including all outcome effects
- The logarithmic sum of the noise level from both developments remains at, or below the construction noise limits

As such, there are no material changes to the outcomes set out in The Noise Chapter.

4.0 Closure

The assessment has required a suitable level of technical ability and has been undertaken by a Suitably Qualified Person (SQP). An individual with all the following credentials has been considered a SQP for this assessment:

- Has a minimum of three years' verifiable experience (within the last five years) of providing noise impact assessments in planning. Such experience has clearly demonstrated a practical understanding of factors affecting acoustics in relation to the proposed development use and in the built environment in general, including acting in an advisory capacity to provide recommendations and design advice in planning, and;
- Holds a recognised acoustic qualification and membership of an appropriate professional body. The primary professional body for acoustics in the UK is the Institute of Acoustics.

This assessment has been led and managed by a SQP as defined above.

Where some elements of the assessment (e.g. measurements) have been carried out by an acoustician who does not meet the requirements above, this has been undertaken with the direct guidance and supervision of a SQP who has reviewed, agreed and overseen the measurement methodology and any results obtained.

The SQP confirms that the relevant measurements and calculations:

- Represent good industry practice in accordance with available guidance.
- Are appropriate given the development being assessed and scope of works proposed.
- Avoid invalid, biased and exaggerated claims.

The checker and author of this document confirm that they both comply with the definition of a SQP defined in this Section.

Regards,

SLR Consulting Limited

[redacted]

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Appendix A Glossary of Terminology

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The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A-1: Sound Levels Commonly Found in the Environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

A.1 Acoustic Terminology

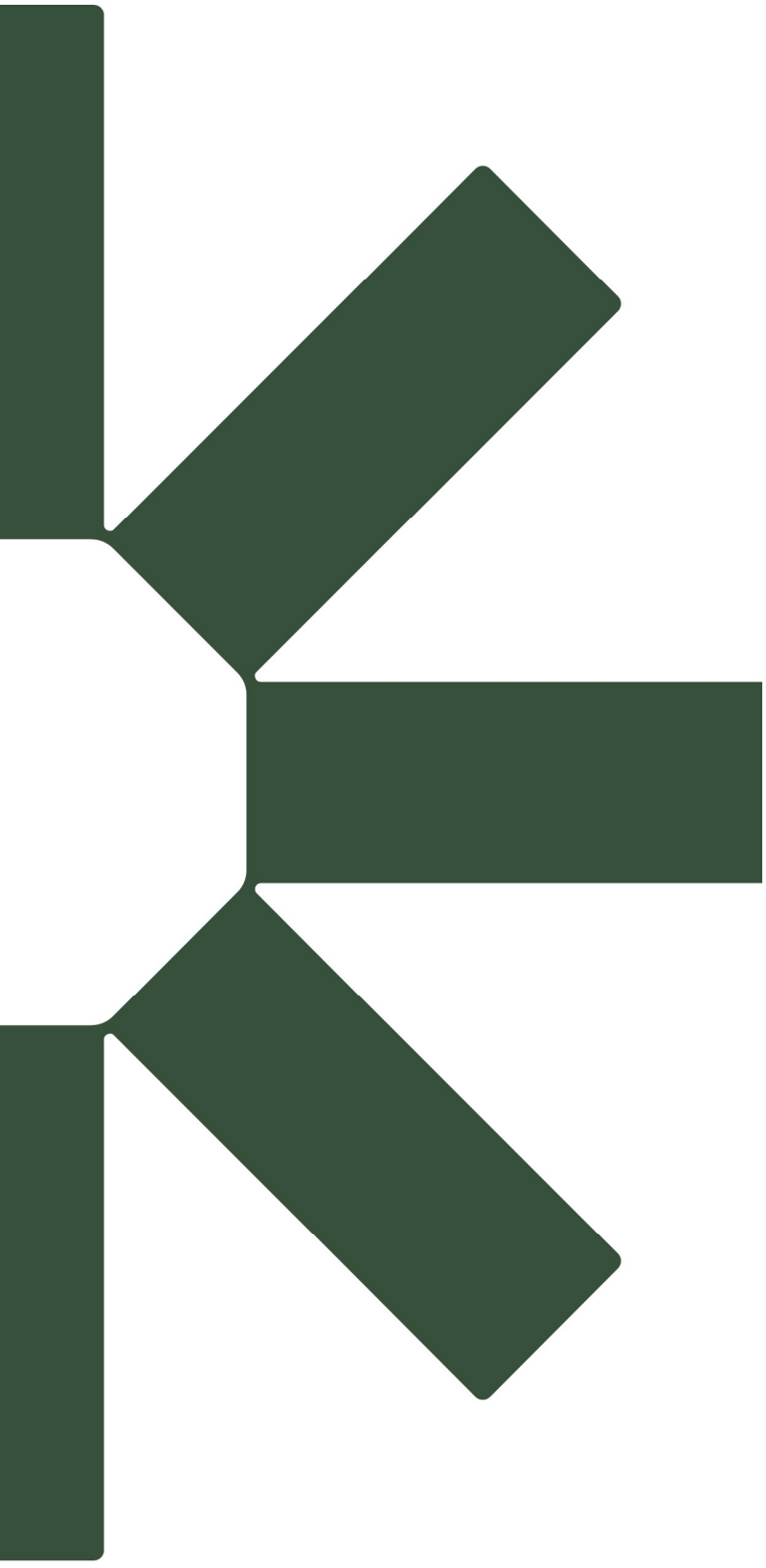
dB (decibel) The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (of 20 µPa).

dB(A) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

$L_{Aeq,\ T}$ $L_{Aeq,\ T}$ is defined as the notional steady sound level which, over a stated period T, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

$L_{A10,\ T}$ & L_{A90} If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{A10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{A90} is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the L_{A10} index to describe road traffic noise.

$L_{Amax(F)}$ $L_{Amax(F)}$ is the maximum A-weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, 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.



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