

SHARPS REDMORE

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Report

Lion Retail Park, Woking

Environmental Noise Report

Prepared by

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Project No 2221029

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- A. Acoustic Terminology

This report has been prepared with all reasonable skill, care and diligence commensurate with an acoustic consultancy practice under the terms and brief agreed with our client at that time. Sharps Redmore provides no duty or responsibility whatsoever to any third party who relies upon its content, recommendations or conclusions.

- 1.4 The delivery hours permitted under the extant planning consent (Reference PLAN/2022/0250) are 06:00 – 22:30 (Monday to Friday); 07:00 – 18:00 (Saturdays) and 08:00 – 18:00 (Sundays). Therefore, the only additional period being sought is the 18:00 to 22:30 on Saturday evening.
- 1.5 The purpose of this report is to consider the impact of noise from delivery activity during the Saturday evening period on neighbouring noise sensitive properties, including the residential properties in Maybury Road to the north of the site on the opposite side of the railway line which forms the northern boundary of the site.
- 1.5 Section 2.0 contains a discussion of the available methods of assessment and assessment criteria.
- 1.6 Section 3.0 of this report contains details of the environmental noise survey, including measurements of delivery activity at the store.
- 1.7 Sections 4.0 of the report contain an assessment of the impact of noise from the proposed variation of delivery hours. The report conclusions are summarised in Section 5.0.
- 1.8 A guide to the acoustic terminology used within the report is included in Appendix A.

2.0 Assessment Methodology and Criteria

National Policy

2.1 The National Planning Policy Framework (NPPF), December 2023, sets out the Government’s planning policies for England and “these policies articulate the Government’s vision of sustainable development.” In respect of noise, Paragraph 191 of the NPPF states the following:

“Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they 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 the 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; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation”.*

2.2 Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Policy Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The guidance contained in the NPPG is summarised in the table below:

TABLE 1: Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed	

Perception	Examples of Outcomes	Increasing Effect Level	Action
		Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

2.3 The NPPF and NPPG reinforce the March 2010 DEFRA publication, “Noise Policy Statement for England” (NPSE), which states three policy aims, as follows:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.”*

2.4 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

“... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.”

Local Policy

2.5 With regard to local policy consideration is given to Woking Borough Council Development Management Policies (DMP) Policy DM7 ‘Noise and Light Pollution’ which for noise generating development states the Council will require a statement detailing noise generation levels and any mitigation measures proposed to ensure that all noise is reduced to an acceptable level. Account will be taken of:

- the location, design and layout of the proposed development;
- existing levels of background noise;
- measures to reduce or contain generated noise; and

- hours of operation and servicing
- 2.6 Taking an overview of strategic national and local policy it is clear that when considering the impact of noise, one must consider the significance of any impact. The presence of an adverse impact in itself is not sufficient to refuse permission.
- 2.7 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:
- i) The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation “Guidelines for Community Noise” contain such guidelines.
 - ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.
 - iii) Another method is to compare the resultant noise level against the background noise level (L_{A90}) of the area. This is the method employed by BS 4142:2014 to determine the impact of noise of an industrial or industrial type nature. It is best suited to the assessment of steady or pseudo-steady noise.

Guideline noise values

- 2.8 There are a number of guidance documents that contain recommended guideline noise values. These are discussed below.
- 2.9 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.
- 2.10 The original BS 8233 was based on the advice contained in the draft World Health Organisation document “Guidelines for Community Noise”. This document was released in final form in 2000. The World Health Organisation guidance is referenced in the NPSE.
- 2.11 The WHO advice is the most useful, comprehensive, and pertinent advice in this case, because it is not specific to the circumstances of the assessment. Instead, it provides guidance on acceptable limits in, for example, schools, dwellings and offices.
- 2.12 The WHO guideline values are appropriate to what are termed “critical health effects”. This means that the limits are at the lowest noise level that would result in any psychological, physiological or sociological effect. They are, as defined by NPSE, set at the Lowest Observed Adverse Effect Level (LOAEL), but do not define the level above which effects may be considered significant (SOAEL). Compliance with the LOAEL should, therefore, be seen as a robust aim.

2.13 The WHO LOAEL guideline values are summarised in the following table.

TABLE 2: WHO Guidelines

Document	Level	Guidance
World Health Organisation "Community Noise 2000"	$L_{AeqT} = 55$ dB	Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	$L_{AeqT} = 50$ dB	Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	$L_{AeqT} = 35$ dB	Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	$L_{AeqT} = 30$ dB	Sleep disturbance, night-time (indoors)
	$L_{AMAX} = 60$ dB	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
	$L_{AMAX} = 45$ dB	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)

- 2.14 For L_{AeqT} criteria the time base (T) given in the document is 16 hours for daytime limits and 8 hours for night time limits. When assessing impact, this has the tendency to smooth out the hourly variations in noise level. As such, our calculations are carried out to a 1-hour time base, which is more stringent assessment than is given in the guidance but is reflective of the actual duration of the delivery process.
- 2.15 In 2018 the WHO published the "Environmental Noise Guidelines for the European Region" (ENGER). The new WHO Environmental Noise Guidelines (page 28) explain that "*The current environmental noise guidelines for the European Region supersede the CNG from 1999. Nevertheless, the GDG (Guideline Development Group) recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid*". Hence the CNG remain relevant to this assessment.
- 2.16 The WHO ENGER brings together the latest research on the effects of specific types of noise on health in relation to transportation noise sources (road, rail and aircraft noise exposure), wind turbines and leisure noise. Hence in direct relation to the specific proposal that this noise assessment considers, the new WHO ENGER are not of material consideration.

Changes in noise level

- 2.17 Changes in noise levels of less than 3 dBA are not perceptible under normal conditions and changes of 10 dB are equivalent to a doubling of loudness. This guidance has been accepted by Inspectors, at Inquiry, to encompass changes in noise levels in the index $L_{Aeq,T}$ in relation to road traffic noise and therefore if of limited use in this case.
- 2.18 The following table shows the response to changes in noise level (known as the Semantic Scale).

TABLE 3: Change in noise level

Change in noise level L_{AeqT} dB	Response	Impact
<3	Imperceptible	None
3 - 5	Perceptible	Slight
6 - 10	Up to a doubling	Significant
11 – 15	More than a doubling	Substantial
> 15	-	Severe

BS 4142:2014+A1:2019

2.19 As discussed, this BS described a method for rating and assessing sound of industrial and/or commercial nature according to the following summary process:

- i) Carry out a numerical assessment of the noise, taking into the character and areas of uncertainty, by comparing the noise against the existing background noise level. The greater the difference between the two, the greater the impact.
- ii) By considering the noise impact against the context in which it is placed. There are many contextual points to consider when considering an assessment of sound impact including the following:
 - The absolute level of sound.
 - The character and level of the specific sound compared to the existing noise climate.
 - The sensitivity of the receptors.
 - The time and duration that the specific sound occurs. The conclusions of assessments undertaken using alternative assessment methods, for example WHO guideline noise values or change in noise level.
 - The ability to mitigate the specific sound through various methods, for example by screening, the selection of quiet plant equipment, the use of attenuators, through the imposition of noise management plans and good practice, façade design and layout/orientation.
 - The form and scale and scale of a development. For example, does not the proposed development involve a new industrial/commercial premise or is the proposal the installation of new plant or an extension to an existing premises?

2.20 It is therefore entirely possible that whilst the numerical outcome of a BS 4142 assessment is indicative of adverse or even significant adverse impact, when the proposal is considered in context the significance of the impact is reduced to an acceptable level.

Local Design Guidance

2.21 SR are not aware of any specific local design guidance however in the notes to Policy DM7 paragraph 4.25 refers to BS 4142 and the national Planning Practice Guidance, both of which are discussed above.

3.0 Survey Details

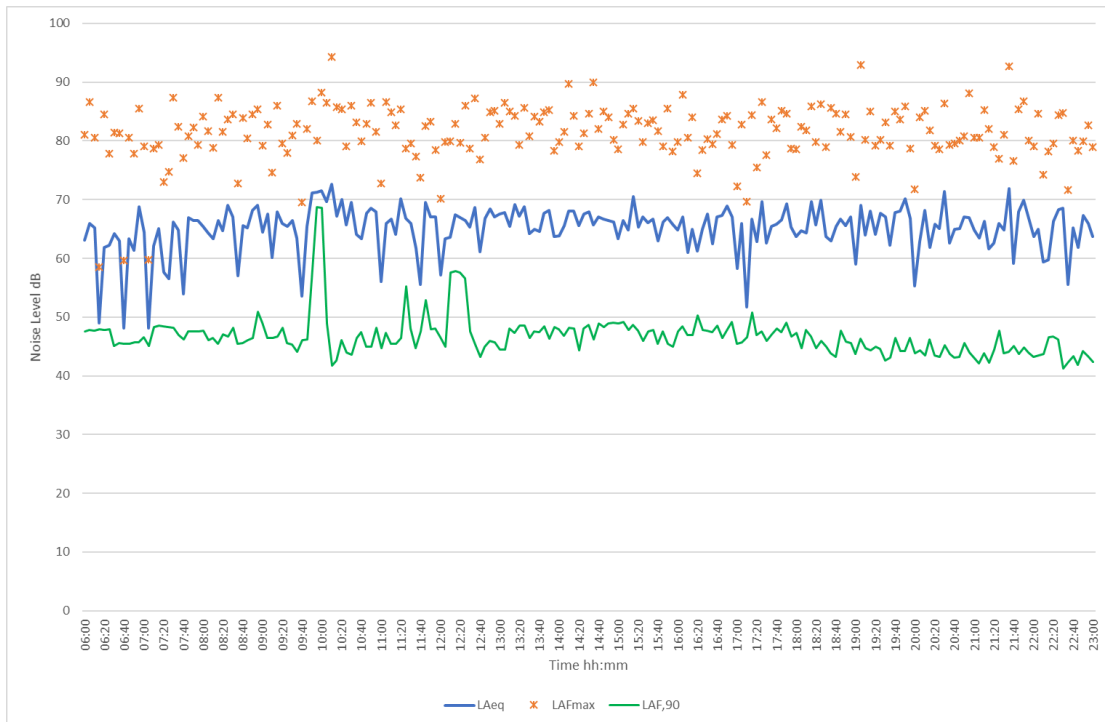
3.1 A noise survey was undertaken on the 16 March 2024 to determine both noise levels from both delivery activity and also existing background noise levels for the additional hours being sought. Measurements were recorded at a location at the rear of the service yard (NL1) as shown in Figure 2 below. The measurement location was similar to that used in the previous assessment carried out by SR. The location was chosen to be representative of the residential properties to the north in Maybury Road (R1).

FIGURE 2: Monitoring Location



- 3.2 Noise measurements were taken using Norsonic type 1 sound level meter which was calibrated at the start and end of the survey and no variation in level was noted. All measurements were carried out in free-field conditions.
- 3.3 The weather conditions during the survey were noted from site observations and from online information and were dry with light southerly winds. Weather conditions were suitable for taking sound level measurements.
- 3.4 A summary of the survey results between 0700 and 2300 hours on Saturday 16 March 2024 is shown in Figure 3 below. Full survey results are available upon request.

FIGURE 3: Survey Results – 16 March 2024



3.5 Based on the survey the background noise levels for the period 18:00 and 22:30 hours is shown in table below:

TABLE 4 Survey Results – 16 March 2024

Date	L _{Af,90} dB
18:00 – 19:00	46
19:00 – 20:00	45
20:00 – 21:00	44
21:00 – 22:00	44
22:00 – 22:30	44

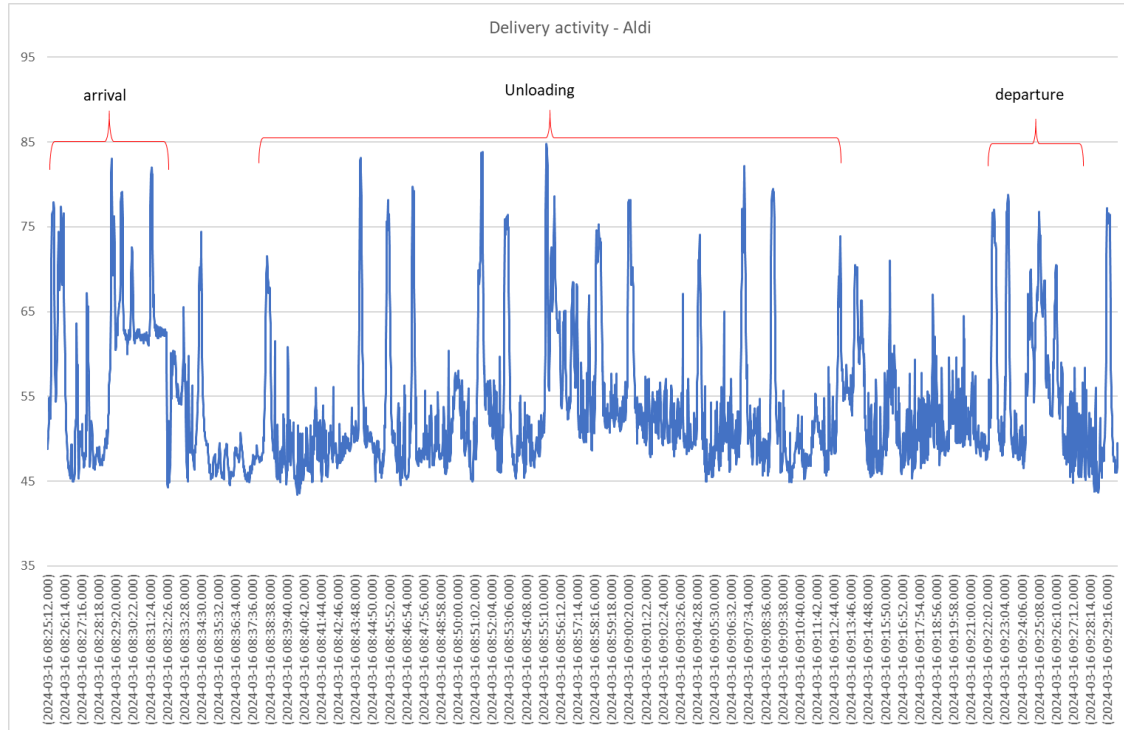
3.6 As previously noted noise levels were dominated by road traffic noise on Oriental Road. It was noted Oriental Road is a busy route with a steady flow of traffic, including commercial vehicles.

3.7 Noise levels from Aldi delivery activity at the site. Vehicles enter the site via the service road before reversing onto the loading bay at the rear of the site. As shown goods are unloaded via a level dock system which means there is no movement of goods and pallets in the yard. Figure 5 includes details of delivery noise levels derived from the survey results.

FIGURE 4: Loading Bay



FIGURE 5: Delivery activity Aldi, Lions Retail Park, Woking



3.8 Using the survey results the noise levels from deliveries have been determined as shown in Table 5 below. All results have been normalised to a distance of 10 metres.

TABLE 5: Delivery activity – Aldi (10 metres)

Event Noise Level					
Arrival		Unloading		Departure	
Duration (Mins)	L _{AeqT} (dB)	Duration (Mins)	L _{AeqT} (dB)	Duration (Mins)	L _{AeqT} (dB)
4	68	35	66	4	66

3.9 Noise levels from vehicle arriving and departing are consistent with those measured by SR and similar sites and used in the original assessment prepared by SR. The duration of the arrival and departure is longer due to the time taken for the vehicle to manoeuvre in and out of the loading bay. With regard to unloading activity noise source levels measured were higher than expected, this is likely to be due to other noise sources in the service yard occurring at the same time as unloading was taking place.

4.0 Noise Assessment

4.1 The nearest noise sensitive properties to the loading bay are the residential properties in Maybury Road, to the north of the site, beyond the rail line which runs behind the units. These properties are approximately 65 metres from the service yard and loading bay. Based on the measurements carried out the predicted noise level from delivery activity has been calculated in Table 6 below. The calculations assume a ground floor receptor to reflect the additional hours being sought. Screening is provided by the railway line which as shown below runs in an elevated position between the service yard and residential properties.

FIGURE 6: Screening provided by rail line – Maybury Road



TABLE 6: Predicted noise levels

Assessment project: Lion Retail Park	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels (L_{AeqT}) *			
Closest residential property address:	Maybury Road		
Source noise level at 10 metres L_{AeqT}	69	66	66
Time - minutes	4	35	4
Distance between noise source and residential property in metres	55	65	55
Screening attenuation dB	10	10	10
Convert to 1 hour - dB	-11.8	-2.3	-11.8
Distance attenuation correction - dB	-14.8	-16.3	-14.8
Activity $L_{Aeq 1 hr}$	32.4 dB	37.4 dB	29.4 dB
Overall delivery activity noise (arrival, unloading, departure) $L_{Aeq 1 hr}$	39 dB		

4.15 Predicted noise levels from delivery activity at the residential properties in Maybury Road are 39 dB L_{Aeq1hr} , this is higher than predicted at the time of SR's original assessment. This is due to measured noise levels being higher than used in the original assessment.

4.16 The purpose of this report is to consider the impact of noise from delivery activities during the Saturday evening period, which will be prohibited following the expiry of the temporary 12 month consent granted. Therefore, the following assessment considers the impact of deliveries outside the Saturday hours of 18:00 and 22:30. The results of the initial BS 4142 assessment are shown in Table 7 below.

TABLE 7: BS 4142 Initial Assessment

	Period	Specific Level L _{AeqT} ¹	Rating Level ²	Background Level (L _{A90}) ³	Difference
Saturday	1800 – 1900	39	42	46	-4
	1900 – 2000	39	42	45	-3
	2000 – 2100	39	42	44	-2
	2100 – 2200	39	42	44	-2
	2200 - 2230	39	42	44	-2

¹Specific level $L_{Aeq1hr(day)}/L_{Aeq15min(night)} + 3dB$ feature correction for impulsivity during unloading

³Representative background noise level for period

- 4.17 Based on the above assessment noise from delivery activity will have low impact, this is same as the original assessment prepared by SR.
- 4.18 BS 4142 also requires that any assessment should have regard to contextual considerations, and an *“effective assessment cannot be conducted without an understanding for the reason(s) for the assessment and the context in which the sound occurs/will occur.”*
- 4.19 In relation to the site deliveries have been received by the store during the Saturday evening period since the store opened in September 2023. SR is not aware of any complaints during this period. When considered with the results of the above assessment the lack of complaints is a positive indication that noise is not causing significant adverse impact to local residents.
- 4.20 Having assessed the impact of noise against objective criteria, having regard to the site context and lack of complaints received from local residents it is concluded that deliveries can continue to be received during the hours currently permitted by Condition 04 of planning consent (PLAN/2022/0910) without causing impact to local residents in line with national and local policy aims.

APPENDIX A

ACOUSTIC TERMINOLOGY

Acoustic Terminology

A1 Noise, defined as unwanted sound, is measured in units of decibels, dB. The range of audible sounds is from 0 dB to 140 dB. Two equal sources of sound, if added together will result in an increase in level of 3 dB, i.e. 50 dB + 50 dB = 53 dB. Increases in continuous sound are perceived in the following manner:

1 dB increase - barely perceptible.

3 dB increase - just noticeable.

10 dB increase - perceived as twice as loud.

A2 Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18000Hz (or 18kHz). The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.

A3 To take account of the varying sensitivity of people to different frequencies a weighting scale has been universally adopted called "A-weighting". The measuring equipment has the ability automatically to weight (or filter) a sound to this A scale so that the sound level it measures best correlates to the subjective response of a person. The unit of measurement thus becomes dBA (decibel, A-weighted).

A4 The second important characteristic of sound is amplitude or level. Two units are used to express level, a) sound power level - L_w and b) sound pressure level - L_p . Sound power level is an inherent property of a source whilst sound pressure level is dependent on surroundings/distance/directivity, etc. The sound level that is measured on a meter is the sound pressure level, L_p .

A5 External sound levels are rarely steady but rise or fall in response to the activity in the area - cars, voices, planes, birdsong, etc. A person's subjective response to different noises has been found to vary dependent on the type and temporal distribution of a particular type of noise. A set of statistical indices have been developed for the subjective response to these different noise sources.

A6 The main noise indices in use in the UK are:

L_{A90} : The sound level (in dBA) exceeded for 90% of the time. This level gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background sound level" of an area.

L_{Aeq} : The equivalent continuous sound level in dBA. This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the intermittent noise". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as aircraft and trains.

L_{A10}: The sound level (in dBA) exceeded for 10% of the time. This level gives an indication of the sound level during the noisier periods of time in any given sample. It has been used over many years to measure and assess road traffic noise.

L_{AMAX} The maximum level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.

A7 The sound energy of a transient event may be described by a term SEL - Sound Exposure Level. This is the L_{Aeq} level normalised to one second. That is the constant level in dBA which lasting for one second has the same amount of acoustic energy as a given A weighted noise event lasting for a period of time. The use of this unit allows the prediction of the L_{Aeq} level over any period and for any number of events using the equation;

$$L_{AeqT} = SEL + 10 \log n - 10 \log T \text{ dB.}$$

Where

n = Number of events in time period T.

T = Total sample period in seconds.

A8 In the open, known as free field, sound attenuates at a rate of 6 dB per each doubling of distance. This is known as geometric spreading or sometimes referred to as the Inverse Square Law. As noise is measured on a Logarithmic scale, this attenuation in distance = 20 Log (ratio of distances), e.g. for a noise level of 60 dB at ten metres, the corresponding level at 160 metres is:

$$60 - 20 \text{ Log } \frac{160}{10} = 60 - 24 = 36 \text{ dB}$$