

SHARPS REDMORE

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Report

**Aldi, Hedge End Retail Park,
Southampton, Hampshire,
SO30 4RT**

Environmental Noise
Assessment of a proposal to
extend permitted delivery
hours

Prepared by

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Contents

- 1.0 Introduction
- 2.0 Assessment methodology and criteria
- 3.0 Noise survey details
- 4.0 Noise from delivery activity
- 5.0 Delivery activity noise reduction measures
- 6.0 Assessment conclusions

Appendices

- A. Site plan
- B. Noise survey results
- C. Predicted delivery event noise levels and BS 4142 assessment
- D. Acoustic terminology

Disclaimer

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.

1.0 Introduction

- 1.1 Deliveries to the consented Aldi store at Hedge End Retail Park, Southampton are controlled by planning permission F/21/91821, planning condition 17. Planning condition 17 states:

“17 No deliveries to or from the retail units the subject of this permission shall be undertaken except between the hours of 0700 and 2200 Mondays to Saturdays or 0900 to 1700 on Sundays and Bank Holidays.

Reason: To protect the amenity of occupiers of nearby residential properties”.

- 1.2 Sharps Redmore (SR) prepared the noise assessment report that accompanied the original planning application for the store. That assessment objectively demonstrated that deliveries could be received between 0600 and 2300 hours. This assessment is undertaken to determine whether the permitted delivery hours could be extended, without associated noise giving rise to significant adverse impact. It is based on actual delivery activity noise measurements taken directly at the Hedge End store, as opposed to SR library data of delivery activity noise levels.
- 1.3 The Aldi delivery loading bay is to be located on the southern side of the store, as part of a larger shared service yard. To the west is Upper Northam Road, which is elevated on an embankment past the site, and beyond the M27 motorway. The closest residential properties are in Goodlands Vale to the south of the retail park (as indicated at Appendix A).
- 1.4 The proposal to extend the permitted delivery hours would not be to facilitate an increase the number of deliveries that the store receives, rather to provide Aldi with the flexibility to spread out existing deliveries over a longer period.
- 1.5 Appropriate assessment methodology and criteria are detailed in Section 2 of this report, whilst details of a noise survey undertaken at the site are displayed in Section 3.
- 1.6 An assessment of noise from deliveries is presented in section 4; delivery activity noise reduction measures are discussed in section 5.
- 1.7 The assessment conclusions are presented in section 6, and a guide to the acoustic terminology used in this report is shown in Appendix D.

2.0 Assessment methodology and criteria

- 2.1 The National Planning Policy Framework (NPPF), September 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 185 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

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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 small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, 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
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, 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.”

- 2.5 Taking an overview of national policy aims and guidance it is clear that when considering the impact of noise that the fact can be heard and causes impact, is not reason to refusal an application as consideration should also be given to the significance of the impact and the mitigation measures available.

- 2.6 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, such as those contained in the World Health Organisation (WHO) “*Guidelines for Community Noise*”.
- 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 described within BS 4142:2014+A1:2019 to determine the significance of sound impact from sources of industrial and/or commercial nature. The noise sources that this standard is intended to assess are sound from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at

industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

Guidelines for Community Noise

- 2.7 This assessment is to consider noise from deliveries that largely fall within the night time period. For deliveries that may occur during the night time periods the WHO Guidelines for Community Noise (GCN) offer the most relevant assessment criteria. This is because for noise that occurs at night it is the absolute level of noise that is the critical factor in relation to recognised sleep disturbance criteria. During the night time period, generally, people are inside their properties. Therefore, the outcome of a BS 4142 assessment (discussed later in this section), which assesses the difference between the external background noise level at the receptor and the external rating level of the specific noise source under consideration, does not reflect the true nature of the noise impact at the receptors. This is confirmed in the scope of BS4142:2014+A1:2019, which states *“the methodology set out in Clauses 7, 8, and 9 of this standard is not intended to be used to assess the extent of the impact at indoor locations”*.
- 2.8 The WHO “Community Noise Guidelines” (CNG) 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 or physiological 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 are significant (the SOAEL). Compliance with the LOAEL should, therefore, be seen as a robust aim.
- 2.9 The relevant World Health Organisation (CNG) noise values are summarised in the following table:

TABLE 2: WHO CNG values

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

- 2.10 For L_{AeqT} criteria the time base (T) given in the documents 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 a more stringent assessment than is given in WHO Guidelines for Community Noise.
- 2.11 The internal CNG values can be converted to an external value by the addition of the attenuation provided by a partially open window of 15 dB. In relation to noise that may occur at night and the potential for sleep disturbance, the WHO Guidelines explain *"For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{Amax} more than 10-15 times per night (Vallet & Vernet 1991)"*. Such that it is not only the noise level that is of consideration but the number of occurrences.
- 2.12 The WHO peak noise criterion of 60 dB L_{Amax} does not represent a level above which people will awaken, rather at noise levels above 60 dB L_{Amax} the onset of sleep disturbance may occur, whereby the depth of sleep may be altered, or eyelids flicker.
- 2.13 Research by the NPL (NPL report CMAM16, September 1998, "Health effect based noise assessment methods: A review and feasibility study" explains that *"In essence, the WHO guidelines represent a consensus view of international expert opinion on the lowest threshold noise levels below which the occurrence rates of particular effects can be assumed to be negligible. Exceedances of the WHO guideline values do not necessarily imply significant noise impact and indeed, it may be that significant impacts do not occur until much higher degrees of noise exposure are reached"*.

Changes in noise level

- 2.14 Changes in noise levels of less than 3 dBA are not perceptible under normal conditions and changes of 10 dBA 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_{AeqT} .

- 2.15 Table 3 below shows the response to changes in noise (known as a semantic scale); this table has been developed from general consensus opinion of acousticians.

TABLE 3: Change in noise level

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

- 2.16 Where the existing ambient noise level is already above the criteria developed from the various guidance documents, it may be considered unreasonable to adopt such criteria. It would be reasonable, however, given the above statement, to consider criteria which do not exceed the existing noise climate, thus giving rise to an overall 3 dB increase i.e. the minimum perceptible. If it is less than the minimum perceptible it cannot be described as disturbing or to affect the amenity of residents.

Assessment using BS 4142:2014+A1:2019

- 2.17 As outlined, this British Standard enables the significance of sound impact to be determined in relation to industrial and commercial sources. The assessment method is a two-step process; firstly, an initial estimate of the noise impact is determined according to the following summary process:
- Determine the background sound levels, in terms of the index L_{A90} , at the receptor locations of interest.
 - Determine the specific sound level of the source being assessed, in terms of its L_{AeqT} level ($T = 1$ hour for day or 15 minutes for night), at the receptor location of interest.
 - Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
 - Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.
 - A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the context. 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 upon context.

- vi) The intent of the planning system is to ensure that a development does not result in “significant adverse impacts on health and quality of life.” BS 4142:2014 considers that the threshold of significant adverse impact is “a difference around +10 dB or more ... depending upon the context”.

2.18 BS 4142:2014+A1:2019 uses the concept of ‘*context*’ in the process of identifying noise impact; this is the second part of the BS 4142 assessment process to determine the overall noise impact. It is important to appreciate that a BS 4142 assessment which does not consider both the initial estimate/numerical level difference and the context upon which the sound occurs is incomplete, and not in accordance with the requirements of the British Standard.

2.19 Section 11 of BS 4142:2014 explains “*The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs (our emphasis). 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” (our emphasis).*

2.20 There are many *context* points to consider when undertaking an assessment of sound impact including:

- The absolute level of sound;
- The character and level of the specific sound in the context of the existing noise climate; for example, is the sound to occur in a location already characterised by similar activities as those proposed?
- The sensitivity of the receptors;
- The time and duration that the specific sound is to occur;
- The conclusions of assessments undertaken using alternative assessment methods, for example WHO guidelines noise values or change in noise level;

2.21 It is therefore entirely possible that whilst the initial estimate/numerical outcome of a BS 4142:2014+A1:2019 assessment is indicative of adverse or significant adverse impact, when the proposal is considered in *context* the significance of the impact is reduced to an acceptable level.

3.0 Noise survey details

- 3.1 SR has carried out three baseline noise surveys at this site. The first noise survey was carried out in April 2021, a further survey was carried out in January 2022, and an updated noise survey was carried out in November 2023. This section presents the findings of the latest baseline noise survey, and compares this to the background noise levels obtained during the 2021 and 2022 surveys.
- 3.2 In addition, noise measurements of delivery activity to the Hedge End store have also been undertaken, for use in this updated noise assessment.

Baseline noise survey

- 3.3 Figure 1 below shows the baseline noise measurement locations for each of the three surveys.

FIGURE 1: Baseline noise survey measurement locations (2021, 2022 and 2023)



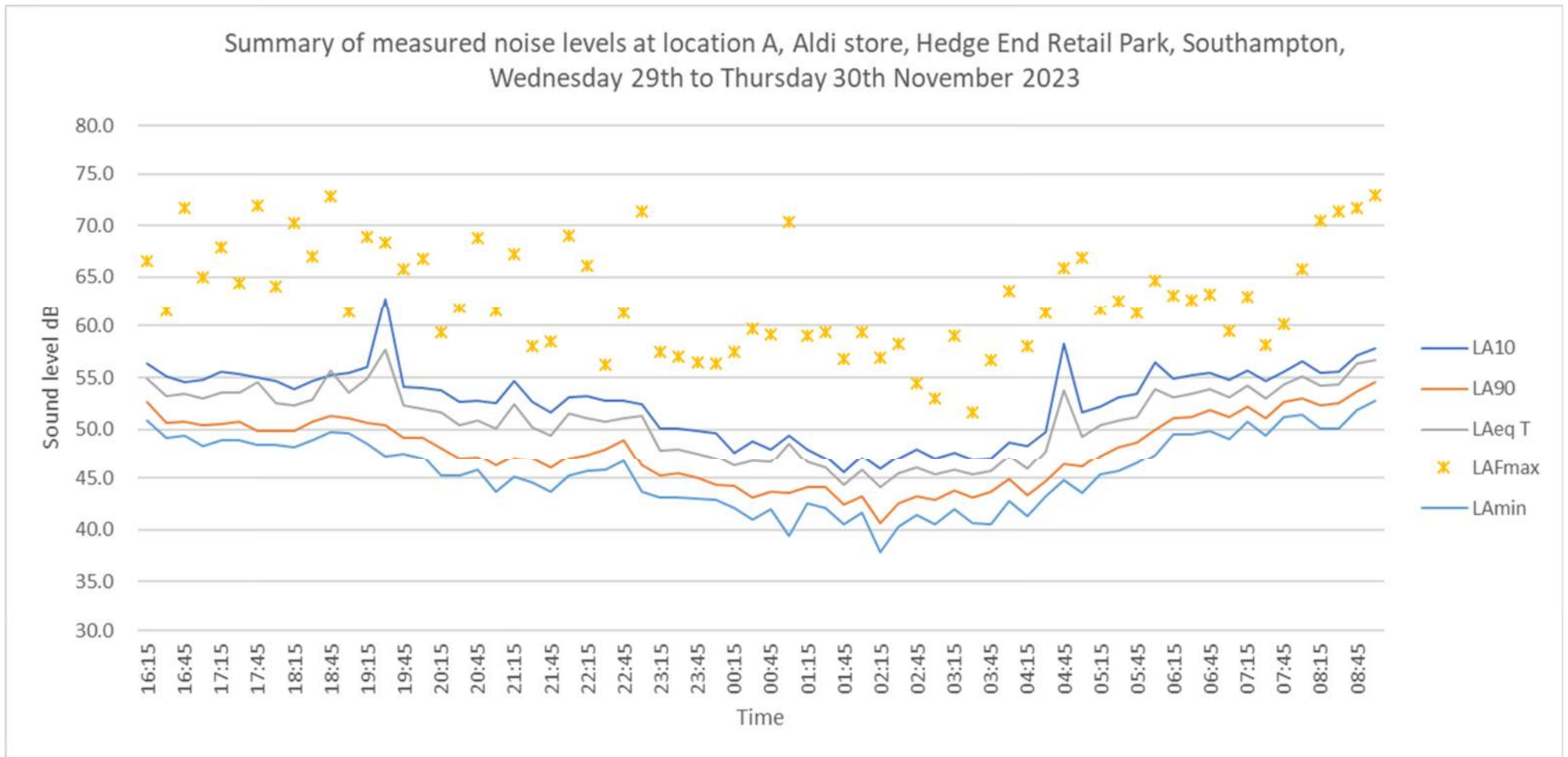
- 3.3 The baseline noise measurements were carried using a Norsonic 118 sound level meter, fitted with an environmental microphone kit. The sound level meter was calibrated at the start and end of the measurements and no variation in level noted. The baseline noise measurements were taken over 15 minute sample periods. Full details of the sound monitoring equipment used for the survey and calibration certificates are available upon request.
- 3.4 The measurements were taken in free field conditions with the microphone approximately 4 metres above local ground level. The measurement location was the same as that used in the 2021 survey.

- 3.5 The weather conditions during the survey were dry, cloudy and cold (1-4°C) and a light northerly wind (<5m/s). Weather conditions are not considered to have materially affected the measured noise levels during the survey.
- 3.6 The noise climate was found to be dominated by road traffic sources, as it was during the 2021 and 2022 surveys.
- 3.7 A summary of the measured 2023 baseline noise levels are shown in Table 4 and Figure 2. Full baseline noise survey results are available at Appendix B.

TABLE 4: Summary of period noise levels

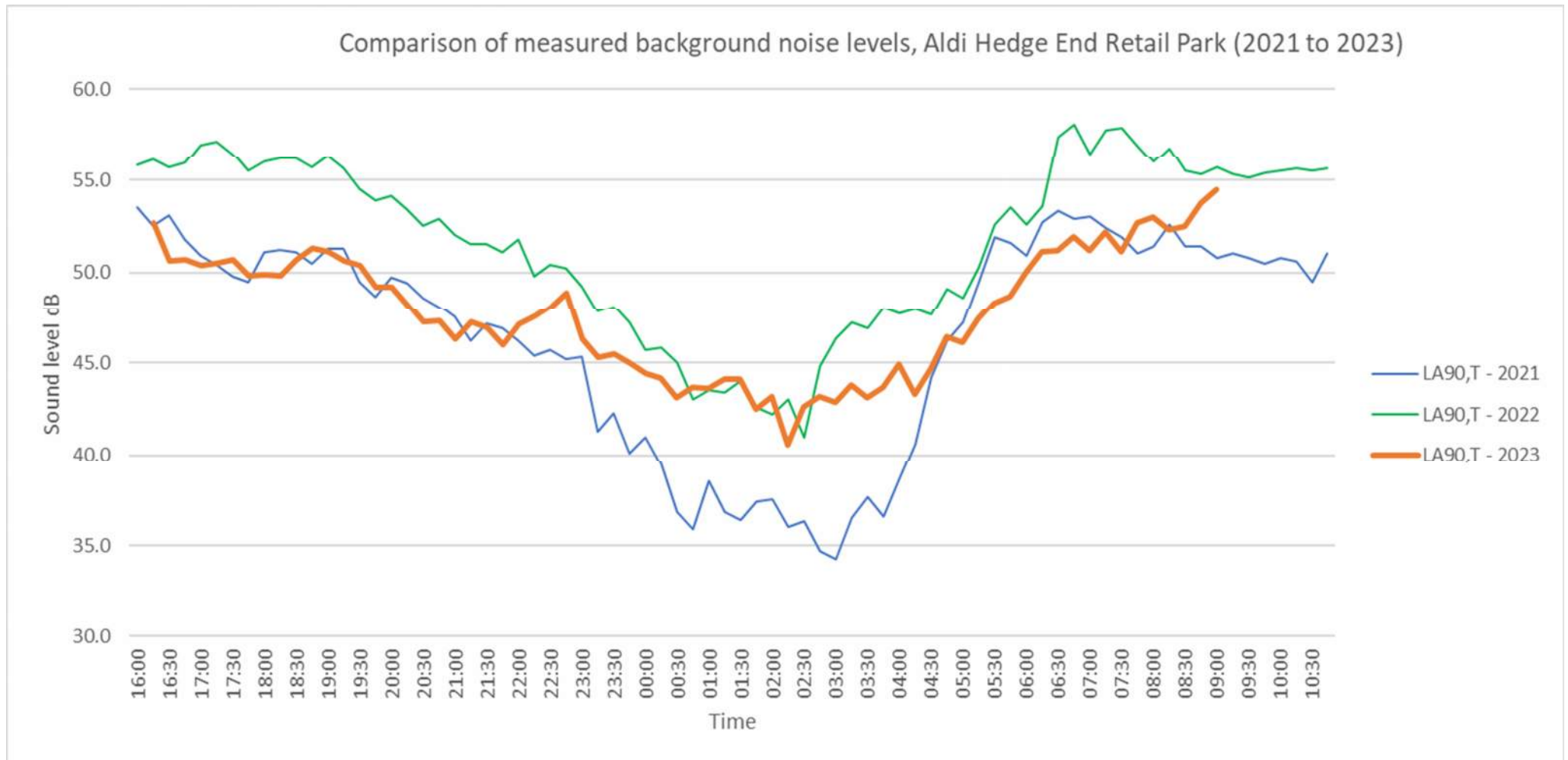
Date	Time	Noise level dB		
		L _{A90} 1 hour	L _{A90} 15 mins *	L _{Aeq} 1 hour
29.11.23	16:00	51.3		53.9
	17:00	50.4		53.7
	18:00	50.4		53.6
	19:00	50.3		55.1
	20:00	48.0		51.3
	21:00	46.6		50.7
	22:00	47.9		51.1
	23:00	45.5	47.6	49.0
30.11.23	00:00	43.9	46.3	46.7
	01:00	43.6	44.4	46.7
	02:00	42.4	44.1	45.4
	03:00	43.4	45.4	45.6
	04:00	44.8	45.9	49.9
	05:00	47.6	49.3	50.5
	06:00	51.1	53.1	53.6
	07:00	51.8		53.7
	08:00	52.9		55.1

FIGURE 2: Summary of 2023 measured baseline noise levels (location A)



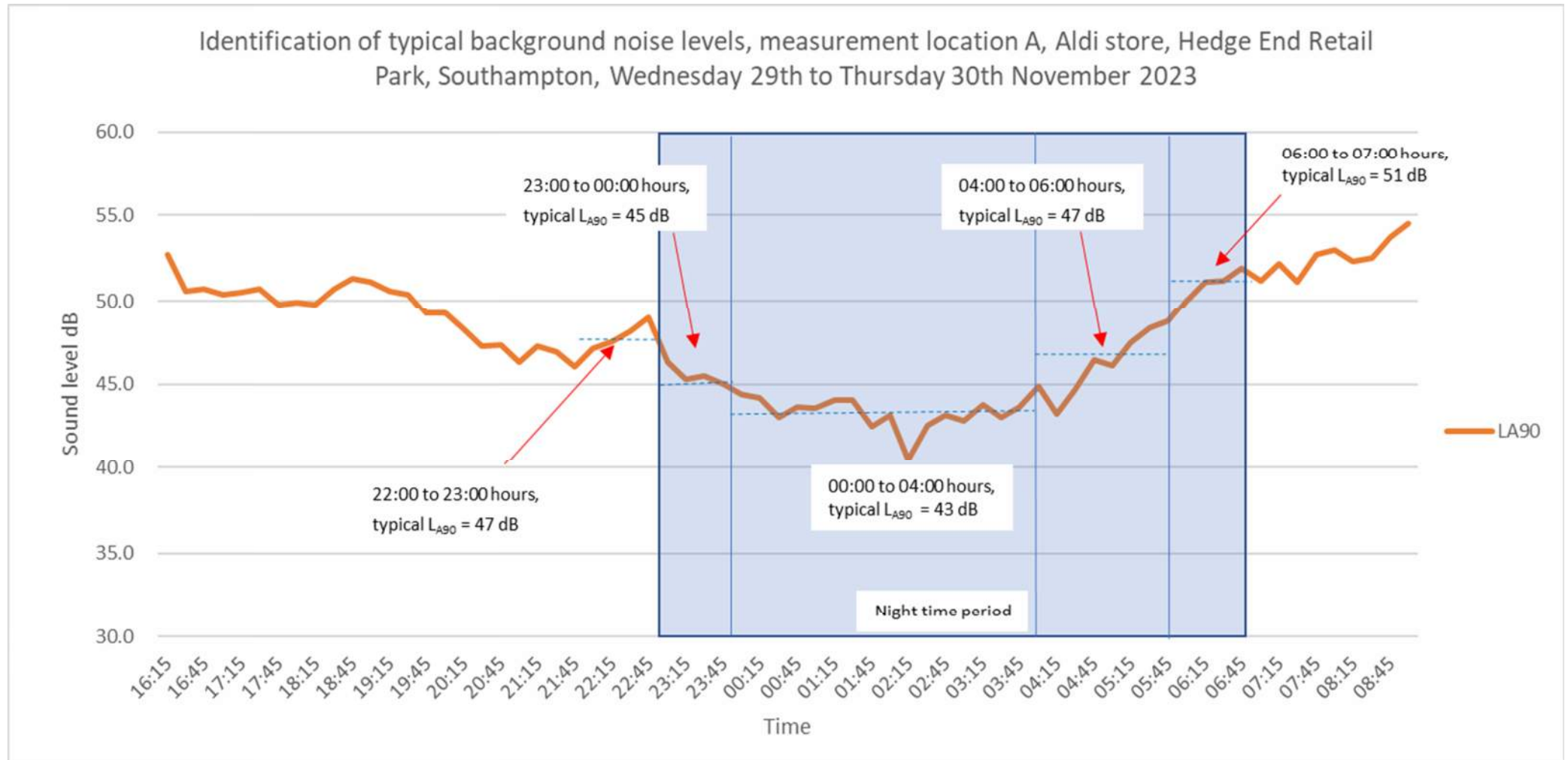
- 3.8 As explained at paragraph 3.1 three baseline noise surveys have been conducted at this site in relation to the Aldi store. The April 2021 noise assessment was presented in the SR noise assessment report that accompanied the original planning application. As part of the planning application consultant process the EHO questioned the positioning of the April 2021 noise survey, in terms of being representative of the noise climate at the closest properties in Goodland Vale to the south. To this end a second noise survey in January 2022 was carried out at a location further into the site away from Upper Northam Road (location B as indicated at Figure 1).
- 3.9 The findings of the January 2022 noise survey indicated a higher baseline noise climate than measured in April 2021 (as reported in the SR technical note dated 10.1.22, reference 2120326). For logistical reasons the recent November 2023 noise survey was set up in the same position as the original noise survey (location A). The measured background noise levels (L_{A90}) from the three surveys are compared at Figure 3 below.

FIGURE 3: Comparison of measured background noise levels



- 3.10 In the context of the previous noise survey work, the November 2023 survey provides a robust baseline against which to use in an updated BS 4142 assessment of delivery activity noise. The 2021 noise data was collected within the Covid period with uncertainty regarding the levels of road traffic noise. The 2022 noise survey (location B), requested by the EHO, measured higher noise levels than either survey at location A.
- 3.11 Figure 4 below identifies the typical night time background noise levels from the most recent baseline survey during the time period that Aldi currently does not received deliveries.

FIGURE 4: Identification of typical background noise levels



Delivery activity source noise level survey

- 3.12 Attended delivery activity noise measurements were undertaken, at Aldi Hedge End Retail Park, during the evening of Wednesday 29th November 2023. The purpose of the survey was to update the delivery unloading source noise levels used in the previous SR noise assessment work (which were based on SR library data), with specific delivery activity measured at the Hedge End Aldi store. Measurements were taken at a reference distance of 5 metres from the rear of the delivery wagon being unloaded and also adjacent to 58 Goodlands Vale, as indicated in Figure 5 below:

FIGURE 5: Delivery activity source noise measurement locations



- 3.13 These attended noise measurements were undertaken using a Norsonic 140 sound level meter (5m from unloading activity), and a Norsonic 118 sound level meter (Goodlands Vale). The microphone at 5m from unloading activity was approximately 2.5 metres from the ground in free field conditions; measurements in Goodlands Vale were with the microphone on a pole approximately 3 metres above ground level (to avoid any local screening of delivery activity), in free field conditions. The sound level meters were calibrated at the start and end of the measurements and no variation in levels were observed.
- 3.14 The delivery was made by standard Aldi type delivery vehicle. Palletted goods were off loaded using a pallet truck via the reverse scissor lift system into the store. Unloading activity was observed to take approximately 45 minutes in total (it is understood that this is a typical delivery duration for this store), but as indicated in

Figure 6 below, delivery activity noise was sporadic during the delivery event. The principle noise source was observed to be from pallets as they were moved over the levelling plates.

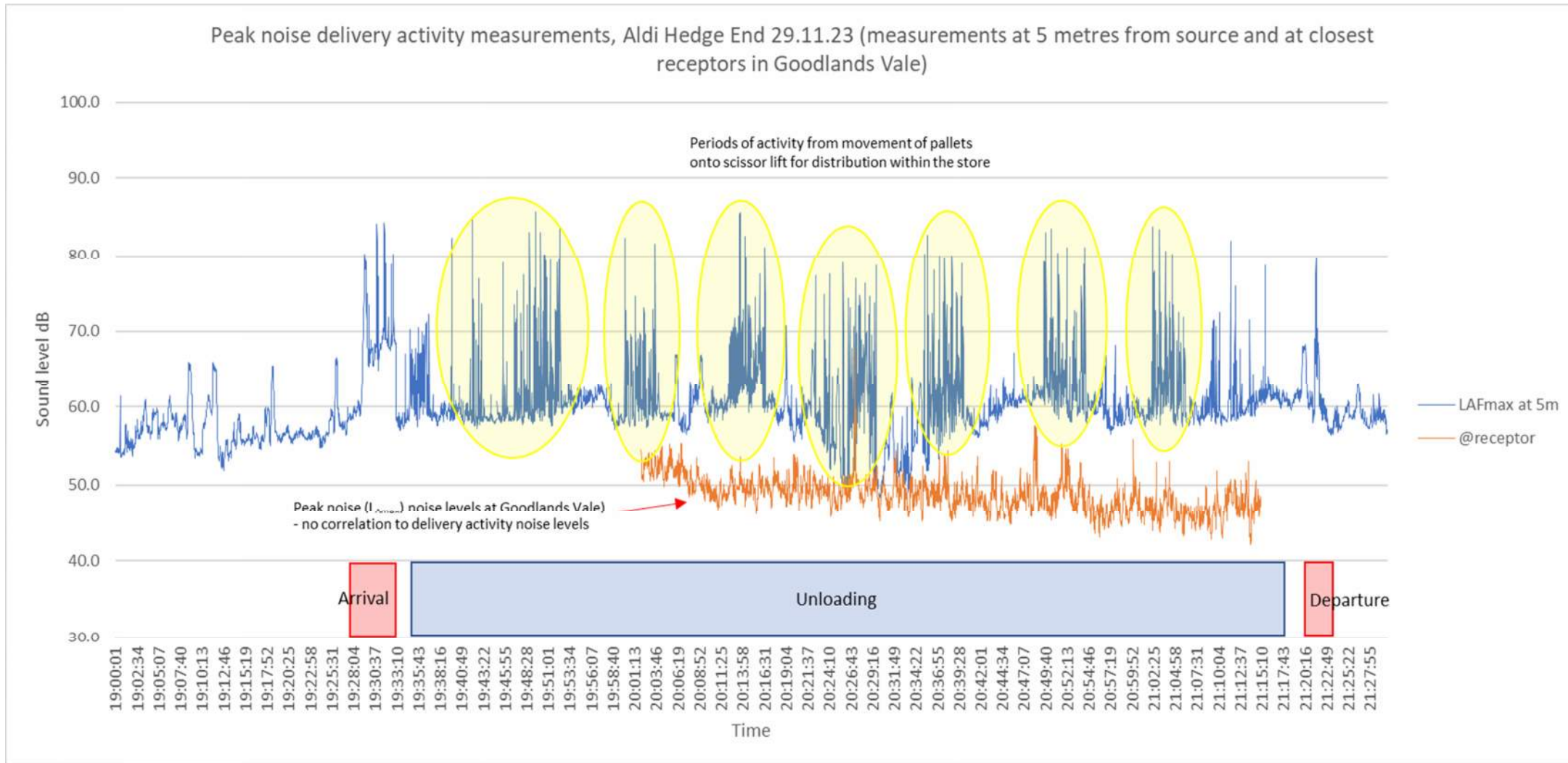
- 3.15 Due to the high extraneous noise climate (from vehicles using Upper Northam Road, and the M27 motorway), the source noise level from unloading activity was derived by subtracting the measured ambient noise levels just prior to the unloading activity commencing from the ambient noise levels during unloading, as indicated in Table 5 below.

TABLE 5: Measured delivery activity noise levels

Date	Time	Measured ambient noise levels ($L_{Aeq T}$) 5m from centre of loading activity	Notes
29.11.23	18:00	57.5	Before delivery
	18:15	59.7	
	18:30	58.5	
	18:45	56.9	
	19:00	57.8	
	Log average	58	
	19:15	62.8	During delivery
	19:30	64.3	
	19:45	62.0	
	20:00	62.0	
	20:15	61.5	
	20:30	60.7	
	20:45	62.3	
	21:00	61.9	
	21:15	60.8	
	Log average	62	
		60 (62-58 'log subtraction]	Calculated unloading activity @5m

- 3.16 Figure 6 below shows the direct measured peak noise levels (L_{Amax}) from delivery unloading activity at Aldi Hedge End Retail Park, Southampton, for use in the delivery noise assessment at Section 4.

FIGURE 6: Measured delivery activity noise levels (at 5 metres)



- 3.17 The direct peak noise delivery activity measurements at Goodlands Vale, shown by the orange line on the graph at Figure 6, were all well below 60 dB, typically around 50 dB L_{Amax} . Subjectively noise from delivery activity was only occasionally perceptible at the measurement location.

4.0 Noise from delivery activity

- 4.1 This section of the noise report provides an assessment of delivery activity in the context of BS 4142, guideline noise values and the change in ambient noise level, based on the delivery source and baseline noise levels measured at the Aldi Hedge End Retail Park store.
- 4.2 Delivery activity noise levels are considered at the closest residential properties at Goodlands Vale to the south of the loading bay (as indicated at Appendix A).
- 4.3 Due to the extraneous noise sources at the Hedge End site, the source noise levels of the arrival and departure events are based on SR library of source data obtained from other Aldi sites (with the durations observed at Hedge End). The unloading component (and peak noise levels) is based on direct measurement at Hedge End, as indicated at Table 5 and Figure 6.

TABLE 6: Delivery activity – baseline source noise levels (free field)

Measured delivery event source noise level (at 10 metres)						
Arrival		Unloading		Departure		Peak noise level L_{Amax}
Duration (mins)	$L_{Aeq T}$ (dB)	Duration (mins)	$L_{Aeq T}$ (dB)	Duration (mins)	$L_{Aeq T}$ (dB)	
3	69	45	54	2	67	74/80/76*

*Arrival/unloading/departure

- 4.4 All these sound levels are representative at 10 metres and are measured with the microphone in free field, away from any reflecting surfaces. The levels stated include all typical delivery activity noise (including reversing alarms, movement of goods, levelling plates, refrigeration units).
- 4.5 Table 7 below shows the predicted ambient ($L_{Aeq T}$) delivery activity noise levels at the closest residential property to the proposed Aldi loading bay (full delivery event activity noise predictions are included at Appendix C1). The predicted delivery noise levels below include screening attenuation provided by a proposed 3 metre high acoustic fence adjacent to the southern boundary of the service yard (screening calculations presented at Appendix C2), as indicated at Appendix A.

TABLE 7: Predicted delivery activity noise levels

Receptor	Predicted noise level dB $L_{Aeq 1 \text{ hour}}$
56/57 Goodlands Vale	37

- 4.6 Notwithstanding the comments at paragraph 2.7, an assessment of delivery activity noise levels using the methodology in BS 4142:2014 is presented in Appendix C3.

- 4.7 The initial assessment (numerical assessment) from BS 4142 indicates differences between the rating level and background sound level of between -9 and -1 dB at 56/57 Goodlands Vale (this is indicative of low impact, depending upon context). This is considering the time periods between 2200 and 0700 hours, the period that deliveries are not currently permitted in. The guidance in BS 4142:2014, Section 11, states:
- “a) Typically, the greater this difference, the greater the magnitude of the impact.
 - b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
 - d) 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”.
- 4.8 Section 11 of BS 4142:2014 explains “The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs (my emphasis). 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” (my emphasis).
- 4.9 As outlined in paragraph 2.7, a key contextual noise consideration (particularly for deliveries occurring between 2300 and 0700 hours) is the comparison of the predicted/measured delivery activity noise level with the WHO CNG values. The table below shows this comparison.

TABLE 8: Comparison of predicted delivery event noise levels with the WHO CNG values

Noise level	Parameter	
	L _{Aeq T}	L _{Amax}
Receptor	56 & 57 Goodlands Vale	
Predicted delivery event noise level day/night ^[1]	37 / 41	-
Predicted delivery peak noise levels Arrival/unload/departure ^[2, 3]	-	56 / 60 / 54
WHO guideline daytime/night time noise value ^[4]	55/45	60
Comply with WHO day/night time guidelines	YES	YES

Notes

[1] Where L_{Aeq T} = 1 hour daytime, 15 minutes night time

[2] Peak noise levels based on direct measurements at Aldi Hedge End

[3] Based on attenuation provided by a 3m high acoustic grade boundary fence

[4] Where L_{Aeq T} = 16 hour daytime and 8 hour night time

- 4.10 The comparison in Table 8 indicates that delivery event noise levels comply with the WHO CNG night time values; and hence would be indicative of low impact. This is supported by the direct noise measurements of delivery activity at Goodlands Vale (Figure 6). Indeed, the measured delivery activity noise levels shows compliance with the WHO CNG in the absence of the proposed 3 high acoustic grade fence.
- 4.11 Predicted delivery activity noise levels can also be compared to the existing ambient noise climate to consider the change in ambient noise level.

TABLE 9: Change in noise level – 56/57 Goodlands Vale

Receptor	Date	Time	Noise level L_{Aeq} 1 hour				Noise impact
			Existing noise climate	Predicted delivery activity noise	Overall existing + predicted	Change in level	
56/57 Goodlands Vale	29.11.23	16:00	53.9	37.0	54.0	0.1	Low
		17:00	53.7	37.0	53.8	0.1	Low
		18:00	53.6	37.0	53.7	0.1	Low
		19:00	55.1	37.0	55.2	0.1	Low
		20:00	51.3	37.0	51.5	0.2	Low
		21:00	50.7	37.0	50.9	0.2	Low
		22:00	51.1	37.0	51.3	0.2	Low
		23:00	49.0	37.0	49.3	0.3	Low
	30.11.23	00:00	46.7	37.0	47.1	0.4	Low
		01:00	46.7	37.0	47.1	0.4	Low
		02:00	45.4	37.0	46.0	0.6	Low
		03:00	45.6	37.0	46.2	0.6	Low
		04:00	49.9	37.0	50.1	0.2	Low
		05:00	50.5	37.0	50.7	0.2	Low
		06:00	53.6	37.0	53.7	0.1	Low
		07:00	53.7	37.0	53.8	0.1	Low
		08:00	55.1	37.0	55.2	0.1	Low

- 4.12 The impact classification in the context of change in ambient noise level for delivery activity occurring during the proposed extended hours periods is low.
- 4.13 Overall, when considering context, this updated assessment objectively demonstrates that when considered in context deliveries could be made during the night time to the Aldi loading bay at Hedge End Retail Park, without associated noise giving rise to significant adverse impact; which is the planning test in accordance with the NPPF. This is subject to the installation of a 3 metre high acoustic grade fence along the southern boundary of the service yard, as indicated in Appendix A.

5.0 Delivery activity noise reduction measures

5.1 It is recommended that the following noise minimisation measures shall be implemented between 2300 and 0700 hours to reduce noise levels from the Aldi loading bay activity:

- There will be adequate signage and instruction to ensure that all drivers and staff follow the noise management measures;
- All engines to be switched off as soon as vehicles are parked at the unloading dock;
- All delivery vehicles to be driven in as quiet a manner as possible, avoiding unnecessary engine revving;
- No radios or stereos to be left on in vehicles during deliveries or at other times;
- Staff to be instructed to work quietly when outside the store or in the loading bay - only performing essential tasks where noise could be generated;
- On-board delivery vehicle refrigeration units shall be switched off prior to the vehicles arrival at site;
- All components of the delivery system to be maintained in good working order.

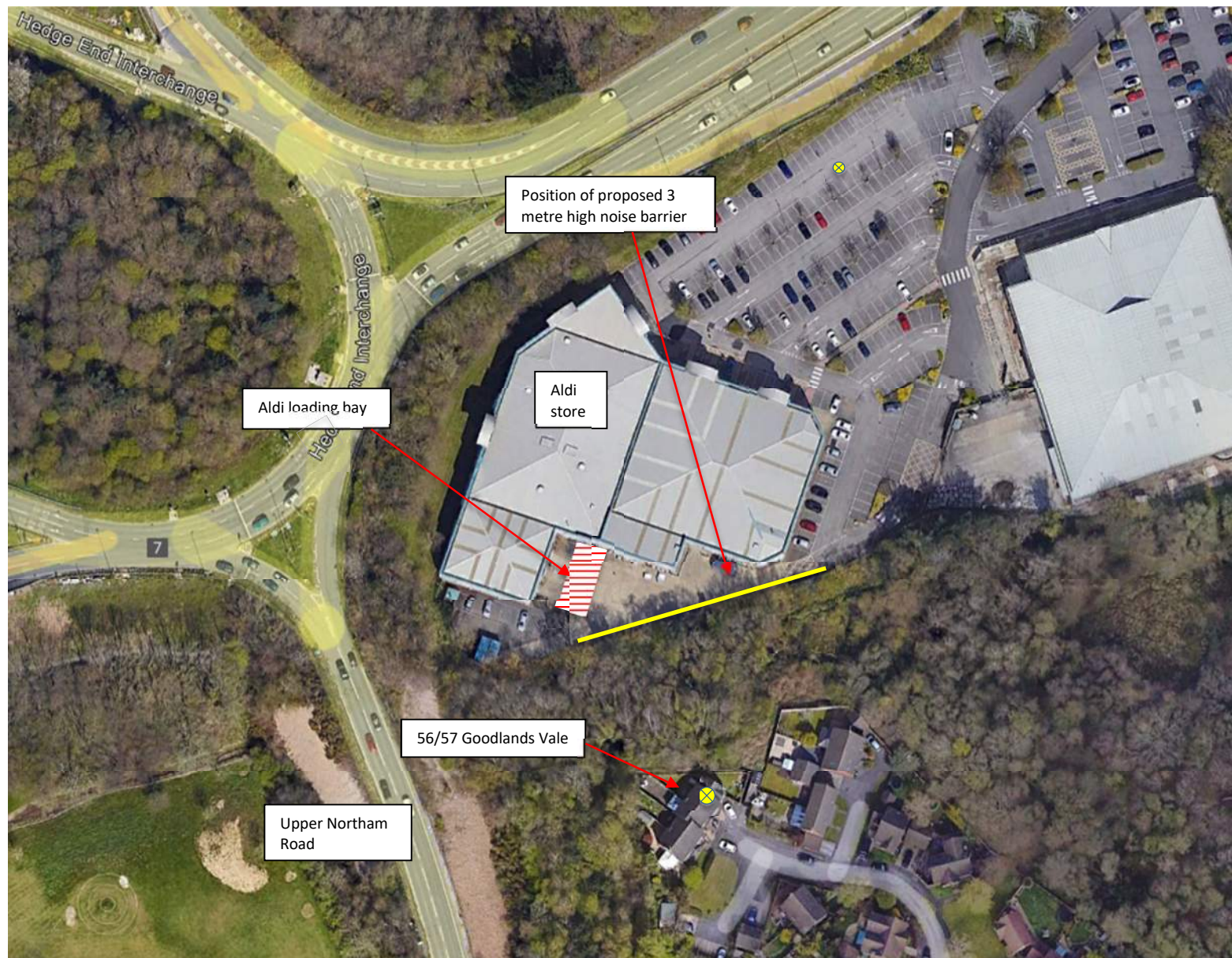
6.0 Assessment conclusions

- 6.1 SR has undertaken an environmental noise assessment to consider whether the consented delivery hours could be extended at the Aldi store, at Hedge End Retail Park, Southampton to allow deliveries to the loading bay at night.
- 6.2 This assessment has objectively demonstrated in the context of nationally recognised standards and planning guidance that predicted (and measured) delivery activity noise levels (based on measured delivery activity noise at the Hedge End store) from the Aldi loading bay at any time would not give rise to significant adverse impact and hence would comply with the requirements of the NPPF.

APPENDIX A

SITE PLAN

Appendix A: Aldi Hedge End site plan



APPENDIX B

NOISE SURVEY RESULTS

Appendix B1	Title: Noise survey results					
Measurement location A: South west corner of Aldi service yard, boundary with Goodlands Vale						
Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
29.11.23	16:15	56.3	52.7	54.9	66.6	50.8
	16:30	55.1	50.6	53.2	61.5	49.2
	16:45	54.6	50.7	53.4	71.7	49.4
	17:00	54.8	50.4	53.0	65.0	48.4
	17:15	55.6	50.5	53.5	67.9	49.0
	17:30	55.3	50.7	53.5	64.4	49.0
	17:45	55.0	49.8	54.6	71.9	48.5
	18:00	54.7	49.9	52.5	64.1	48.5
	18:15	53.9	49.8	52.3	70.3	48.3
	18:30	54.7	50.7	52.9	67.0	49.0
	18:45	55.2	51.3	55.7	72.8	49.7
	19:00	55.4	51.1	53.5	61.4	49.6
	19:15	56.0	50.6	54.9	68.9	48.6
	19:30	62.9	50.4	57.7	68.4	47.4
	19:45	54.1	49.2	52.3	65.8	47.6
	20:00	54.0	49.2	52.0	66.8	47.1
	20:15	53.8	48.2	51.6	59.4	45.2
	20:30	52.6	47.2	50.4	61.8	45.2
	20:45	52.8	47.3	50.9	68.8	45.8
	21:00	52.5	46.3	50.1	61.5	43.7
	21:15	54.7	47.2	52.4	67.2	45.1
	21:30	52.6	46.9	50.2	58.0	44.6
	21:45	51.6	46.0	49.4	58.5	43.7
	22:00	53.1	47.1	51.5	69.0	45.3
	22:15	53.2	47.5	51.1	66.1	45.7
	22:30	52.8	48.1	50.7	56.2	45.8
	22:45	52.8	48.9	51.1	61.3	46.7
	23:00	52.4	46.3	51.3	71.4	43.7
	23:15	50.1	45.3	47.9	57.5	43.1
	23:30	50.1	45.5	48.0	57.0	43.1
	23:45	49.9	45.0	47.6	56.5	43.0
30.11.23	00:00	49.6	44.4	47.2	56.3	42.9
	00:15	47.7	44.2	46.3	57.5	42.1
	00:30	48.8	43.1	46.7	59.7	41.0
	00:45	48.0	43.7	46.6	59.1	42.0
	01:00	49.4	43.6	48.6	70.4	39.4
	01:15	48.1	44.1	46.6	59.0	42.6
	01:30	47.1	44.1	46.0	59.4	42.1
	01:45	45.6	42.5	44.4	56.8	40.5
	02:00	47.1	43.2	45.8	59.4	41.7
	02:15	45.9	40.6	44.1	56.9	37.8
	02:30	47.1	42.6	45.5	58.2	40.3
	02:45	48.0	43.2	46.0	54.4	41.4
	03:00	47.2	42.9	45.4	53.0	40.5
	03:15	47.7	43.8	45.8	59.0	42.0
	03:30	47.0	43.1	45.4	51.6	40.6
	03:45	47.1	43.7	45.7	56.7	40.5
	04:00	48.7	44.9	47.1	63.6	42.8
	04:15	48.4	43.3	45.9	58.0	41.3
	04:30	49.7	44.7	47.8	61.3	43.2

Appendix B2	Title: Noise survey results
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Measurement location A: South west corner of Aldi service yard, boundary with Goodlands Vale

Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
30.11.23	04:45	58.3	46.4	53.8	65.9	44.8
	05:00	51.6	46.1	49.3	66.9	43.6
	05:15	52.2	47.4	50.4	61.6	45.4
	05:30	53.1	48.3	50.9	62.6	45.7
	05:45	53.4	48.7	51.2	61.3	46.5
	06:00	56.5	50.0	53.9	64.7	47.5
	06:15	54.9	51.1	53.1	63.2	49.5
	06:30	55.2	51.2	53.4	62.7	49.5
	06:45	55.4	51.9	53.9	63.3	49.9
	07:00	54.8	51.2	53.1	59.5	49.1
	07:15	55.7	52.2	54.2	63.1	50.7
	07:30	54.7	51.1	53.0	58.1	49.4
	07:45	55.6	52.7	54.3	60.2	51.2
	08:00	56.6	53.0	55.1	65.8	51.4
	08:15	55.4	52.3	54.2	70.5	50.1
	08:30	55.6	52.5	54.3	71.4	50.1
	08:45	57.1	53.7	56.3	71.7	51.9
	09:00	57.8	54.5	56.7	73.0	52.8

APPENDIX C

PREDICTED DELIVERY EVENT NOISE LEVELS AND BS 4142 ASSESSMENT

Appendix C1: Predicted delivery activity noise levels

APPENDIX C1

Assessment project: Aldi Hedge End Retail Park	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels ($L_{Aeq,T}$) *			
Closest residential property address:	56 & 57 Goodlands Vale		
Source noise level at 10 metres $L_{Aeq,T}$	69	54	67
Time - minutes	3	45	2
Distance between noise source and residential property in metres	50	66	50
Screening attenuation dB	8	4	8
Convert to 1 hour - dB	-13.0	-1.2	-14.8
Convert to 15 mins - dB	-7.0	-0.3	-
Distance attenuation correction - dB	-14.0	-16.4	-14.0
Activity $L_{Aeq,1\text{ hr}}$	34.0 dB	32.4 dB	30.2 dB
Activity $L_{Aeq,15\text{ mins}}$	40.0 dB	33.3 dB	-
Rating level correction	0 dB	3 dB	0 dB
Resultant daytime rating level $L_{Ar,Tr}$	34.0 dB	35.4 dB	30.2 dB
Resultant nighttime rating level $L_{Ar,Tr}$	40.0 dB	36.3 dB	-
Overall delivery activity noise (arrival, unloading, departure) dB $L_{Aeq,1\text{ hr}}$	37 dB		
Overall delivery activity noise (arrival + unloading) dB $L_{Aeq,15\text{ mins}}$	41 dB		
Rating level dB $L_{Aeq,1\text{ hr}}$	38 dB		
Rating level dB $L_{Aeq,15\text{ mins}}$	42 dB		
Delivery noise activity - predicted peak noise levels (L_{Amax})			
Aldi, measured source noise level normalised to 10 metres L_{Amax}	78	80	76
Distance between noise source and residential property in metres	50	66	50
Screening attenuation dB	8	4	8
Distance attenuation correction - dB	-14.0	-16.4	-14.0
Peak noise level dB L_{Amax}	56	60	54

Appendix C2: Screening calculations

Appendix C2.1

BASIC BARRIER ATTENUATION
(based on Maekawa or CRTN)

Receptor: **Goodlands Vale**
Project: **Aldi Hedge End**

Source: **Delivery activity: arrival and departure** **Receiver:** **Goodlands Vale**

Barrier Height

Source Height _____ Receiver Height _____

Source-to-Barrier Distance Receiver-to-Barrier Distance

Source-to-Barrier Distance	Source Height
7.0 m	1.5 m
Receiver-to-Barrier Distance	Receiver Height
43.0 m	6.5 m
	Barrier Height
	3.0 m

Path difference = 0.052 m

Boundary fence

Frequency - Hz	63	125	250	500	1K	2K	4K	8K	CRTN
Attenuation - dB	5.3	5.7	6.5	7.8	9.6	11.8	14.3	17.1	8.3 dBA

Appendix C2.2

BASIC BARRIER ATTENUATION
(based on Maekawa or CRTN)

Receptor: **Goodlands Vale**
Project: **Aldi Hedge End**

Source: **Delivery activity: unloading** **Receiver:** **Goodlands Vale**

Barrier Height

Source Height _____ Receiver Height _____

Source-to-Barrier Distance Receiver-to-Barrier Distance

Source-to-Barrier Distance	Source Height
24.0 m	1.5 m
Receiver-to-Barrier Distance	Receiver Height
42.0 m	6.5 m
	Barrier Height
	3.0 m

Path difference = 0.003 m

Boundary fence

Frequency - Hz	63	125	250	500	1K	2K	4K	8K	CRTN
Attenuation - dB	4.7	4.7	4.6	4.5	4.2	3.5	1.7	0.0	4.3 dBA

APPENDIX C3

Results	Time period					Relevant clause	Commentary
	29-30.11.23						
	2200 - 2300	2300 - 0000	0000 - 0400	0400 - 0600	0600 - 0700		
Receptor	56 and 57 Goodlands Vale						
Background sound level dB (L _{A90})	47 dB	45 dB	43 dB	47 dB	51 dB	8.1, 8.1.3	For daytime the background sound level is the L _{A90 1hour} value and for night time the L _{A90 15 minute} values
Specific sound level - predicted delivery event noise level	37 dB	41 dB	41 dB	41 dB	41 dB		Predicted delivery activity noise level is L _{Aeq 1 hour} for daytime and L _{Aeq 15 minutes} for night time
Acoustic feature correction (applied in delivery calc sheet)	rating level corection of +3 dB is applied within delivery calculation to unloading component					9.2	+3 dB rating level correction applied for 'just' perceptible impulsivity from bangs and crashes of unloading activity at night. This is because the receptor location is inside and a 3 metre hgih acoustic fence is proposed.
Rating level	38 dB	42 dB	42 dB	42 dB	42 dB	9.2	
Background sound level	47 dB	45 dB	43 dB	47 dB	51 dB	8.1	
Excess of rating level over background level	-9	-3	-1	-5	-9	11	
Assessment is indicative of low impact	Relevant clause 11 The context is: 1. Predicted delivery event noise levels (L _{Aeq 1 hour}) are well below the WHO Community Noise daytime and night time guideline values 2. The predicted delivery event noise levels are below the existing ambient noise climate						
Uncertainty of the assessment	Relevant clause 10						
	Weather conditions during the survey were good and as such are not considered to have influenced the measured background noise climate						
	The excess of the rating level over the background sound level is between -9 dB and -1 dB in this instance the uncertainty of the measurement is unlikely to have any significance to the outcome of the assessment.						
	Uncertainty of the delivery noise source data is reduced by direct measurements of delivery activity at the Hedge End Aldi store (and comparison of these measured levels to our large database of delivery activity noise collected at numerous Aldi stores nationwide).						
	Uncertainty of the measured background noise climate is reduced by the use of the latest (and generally lowest) measured background noise levels, as presented at Figure 3 within the report.						

APPENDIX D

ACOUSTIC TERMINOLOGY

Acoustic Terminology

- D1 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. $50\text{ dB} + 50\text{ dB} = 53\text{ dB}$. 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.

- D2 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.

- D3 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).

- D4 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 .

- D5 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.

- D6 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.

- D7 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.

- D8 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:

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