

Report

**Afan Way, Burrows Yard,
Port Talbot**

Environmental Noise
Assessment of a proposed
Aldi store and drive thru
development

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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 Sharps Redmore (SR) has been instructed to undertake a noise assessment of a proposed Aldi store and 'drive-thru' development at land to the south of Water Street, Port Talbot. The proposal would include customer car park provision, a delivery loading bay, fixed plant equipment and a 'drive-thru' facility.
- 1.2 The Aldi site is currently an open field bordered by Water Street to the north, Isaac's Place to the West and Afan Way to the south. The proposed Aldi store/drive thru location plan is indicated at Appendix A.
- 1.3 The objective of the assessment is to determine how noise that may be generated as a result of the proposed Aldi store and 'drive-thru' facility would affect existing and future residential properties. Based on experience of similar developments, the following main impacts have been identified:
 - Noise from fixed mechanical services plant
 - Noise from servicing activity
 - Noise from trading activity
 - Noise from 'drive-thru' activity
- 1.4 Section 2 contains a discussion of the available methods of assessment and assessment criteria.
- 1.5 Section 3 of this report presents details of the environmental noise survey undertaken at the site.
- 1.6 The different components of operational noise are considered in sections 4 to 7; the assessment conclusions are contained in section 8.
- 1.7 A guide to the acoustic terminology used within the report is included in Appendix E.

2.0 Assessment methodology and criteria

- 2.1 Section 6.7.14 of Planning Policy Wales (PPW Revision 12, February 2024) states: “Proposed development should be designed wherever possible to prevent adverse effects to amenity, health and the environment but as a minimum to limit or constrain any effects that do occur. In circumstances where impacts are unacceptable, for example where adequate mitigation is unlikely to be sufficient to safeguard local amenity in terms of air quality and the acoustic environment it will be appropriate to refuse permission.”
- 2.2 It is clear that where the policy refers to “proposed development should be designed *wherever possible* [my emphasis] to prevent adverse effects to amenity”. This policy has the same meaning as that contained in the NPPF, whereby when adverse impacts occur, they should be mitigated and reduced as far as possible, and not that such adverse impacts should not occur. It goes on “where impacts are unacceptable, for example where adequate mitigation is unlikely to be sufficient to safeguard local amenity in terms of air quality and the acoustic environment it will be appropriate to refuse permission”. In other words, if noise reaches a level above the threshold of an adverse impact, i.e it is significant, planning permission may be refused.
- 2.3 General guidance on noise for planning applications is still contained in Technical Advice Note (TAN 11), "Noise", issued in October 1997. TAN 11 contains advice in Annex A on the suitable noise limits for residential development near to different types of noise sources such as road traffic, rail traffic, air traffic, or mixed sources. The current TAN 11 guidance document is soon to be replaced by “Technical Advice Note 11: Air Quality, Noise and Soundscape (TAN 11)”; albeit the document has only been released as a consultation draft at this time, and as such does not reflect current guidance.
- 2.4 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

- 2.5 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.
- 2.6 In 2018 the WHO published the “Environmental Noise Guidelines for the European Region” (ENGER). The 2018 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.
- 2.7 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.
- 2.8 The relevant World Health Organisation (CNG) noise values are summarised in the following table:

TABLE 1: WHO CNG values

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)

- 2.9 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.

- 2.10 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.

Changes in noise level

- 2.11 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} .
- 2.12 Table 2 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 2: 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

- 2.13 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

- 2.14 As outlined, this British Standard enables the significance of sound impact to be determined in relation to industrial and commercial sources. The significance of sound impact is to be 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.

- v) 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.
- 2.15 BS 4142:2014+A1:2019 includes the concept of ‘context’ to the process of identifying noise impact. 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).
- 2.16 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.
- 2.17 It is therefore entirely possible that whilst the numerical outcome of a BS 4142 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 Environmental noise survey details

- 3.1 A noise survey was carried out at the site between Tuesday 7th and Wednesday 8th February 2023. The purpose of the survey was to establish the existing noise climate in the vicinity of the site, at a position representative of the closest residential properties to the proposed Aldi store and coffee 'drive thru' facility.
- 3.2 Two baseline noise survey locations were utilised as indicated in Figure 1 below.

FIGURE 1: Noise measurement location



- 3.3 Unattended noise measurements were taken using Norsonic 140 and 118 sound level meters. Both sound level meters were calibrated before and after the measurements and no drift in calibration signal was observed. Weather conditions were during the survey were calm and dry and therefore suitable for noise measurements.
- 3.4 Noise measurements were taken over 15 minutes sample periods during the survey, from 1600 hours on Tuesday 7th to 1200 hours on Wednesday 8th February 2023. The sound level meter microphones were located in free field conditions at a height of approximately 3 metres above local ground level.
- 3.5 The background noise levels measured during the survey were principally dominated by both local and distant road traffic noise. Upon analysis of the noise survey data, it is noted

that the noise climate does not materially reduce, as might typically be expected, at night. It is considered that this may be due to influence from the Port Talbot steel works to the south east of the site.

- 3.6 The measured noise levels are summarised in the table below and in Figure 2, and are presented in full at Appendix B.

TABLE 3: Summary of measured hourly noise levels

Date	Time	Noise level dB					
		Location 1			Location 2		
		L _{A90} 1 hour	L _{A90} 15 mins	L _{Aeq} 1 hour	L _{A90} 1 hour	L _{A90} 15 mins	L _{Aeq} 1 hour
7.2.23	16:00	52.6		60.5	50.5		68.9
	17:00	50.9		60.6	51.4		58.9
	18:00	49.2		58.8	52.0		60.2
	19:00	51.3		60.6	54.4		61.2
	20:00	51.0		56.9	52.5		55.7
	21:00	50.8		56.9	52.2		55.0
	22:00	50.6		55.8	51.7		54.8
	23:00						
8.2.23	00:00		49.3	53.5		51.6	59.4
	01:00		50.3	53.3		53.1	59.4
	02:00		48.8	51.7		50.0	54.9
	03:00		50.0	52.3		50.1	53.7
	04:00		48.1	51.4		49.0	52.2
	05:00		48.8	52.5		50.1	53.0
	06:00		51.3	56.4		52.4	55.4
	07:00		52.7	58.5		53.5	56.2
	08:00	54.6		60.1	56.1		57.4
	09:00	55.5		61.1	58.0		59.7
	10:00	55.0		61.0	56.1		60.0
	11:00	52.4		60.1	50.0		54.0
		52.9		59.9	50.1		56.5

- 3.7 Analysis of the measured noise survey data at location 1 indicates a typical daytime background noise level of 52 dB L_{A90} and a typical night time background noise level of 49 dB L_{A90}.
- 3.8 Analysis of the measured noise survey data at location 2 indicates a typical daytime background noise level of 53 dB L_{A90} and a typical night time background noise level of 51 dB L_{A90}.

FIGURE 2: Summary of measured noise levels at Location 1

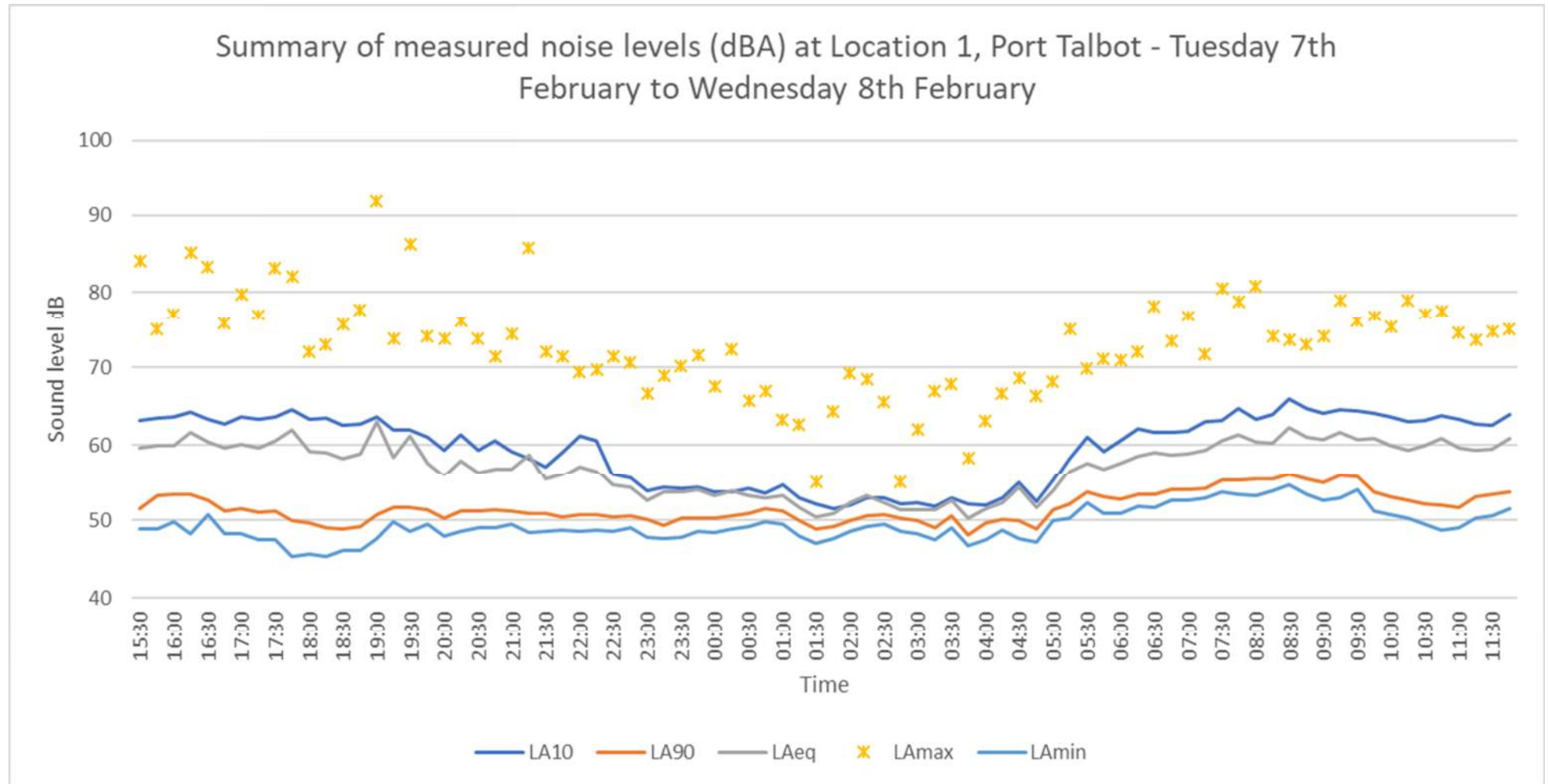
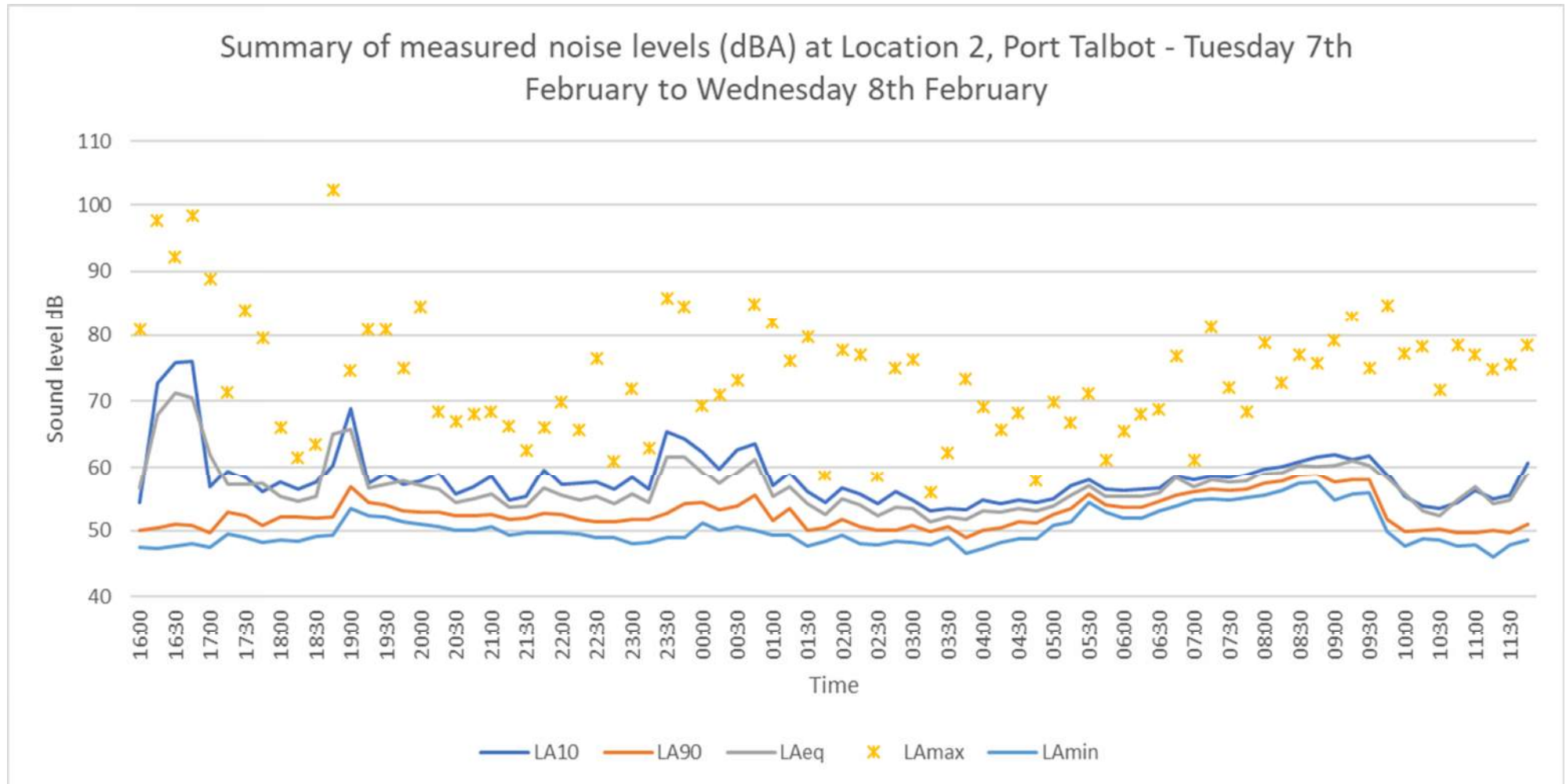


FIGURE 3: Summary of measured noise levels at Location 2



4.0 Noise from mechanical services plant

- 4.1 The precise details of the fixed plant equipment for the proposed Aldi store and 'drive thru' facility is to be finalised, however, the fixed plant is likely to comprise of refrigeration and ventilation equipment. The compound for the Aldi refrigeration plant equipment is to be on the north side of the store adjacent to the loading bay. It is appropriate to seek to set plant noise limits that could be secured through imposition of a suitably worded planning condition, based on the survey of background sound levels.
- 4.2 The closest residential properties to the proposed refrigeration plant equipment are to the west on Enfield Street/Isaac's Place.
- 4.3 The objective assessment of plant sound sources in commercial premises should be undertaken in accordance with British Standard 4142:2014+A1:2019. This Standard enables the resultant sound levels from new plant equipment to be compared against the existing background sound level (L_{A90}) of an area to assess the impact.
- 4.4 In terms of seeking to set appropriate plant rating sound limits, the advice in BS 4142:2014 is that *"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 of having a low impact, depending on the context"* (clause 11, note 'd').
- 4.5 Given the high background noise climate, to minimise background noise creep it is considered reasonable to seek to set plant noise limits that are 10 dB below the typical background noise climate (as indicated at Figures 2 and 3 and at paragraphs 3.7 and 3.8). For fixed plant noise the following rating level limits would be appropriate; 42 dB daytime and 39 dB at night.
- 4.6 The following planning condition is recommended to secure the above criteria:

"No fixed plant and/or machinery shall come into operation until details of the fixed plant and machinery serving the development hereby permitted, and any mitigation measures to achieve this condition, are submitted to and approved in writing by the local planning authority. The rating level of the plant sound emitted from the site shall not exceed 42 dBA between 0700 and 2300 hours and 39 dBA at all other times. The sound levels shall be determined by measurement or calculation at the nearest noise sensitive premises. The measurements and assessment shall be made according to BS 4142:2014+A1:2019."

5.0 Noise from customer car parking activity

- 5.1 SR has previously undertaken extensive noise monitoring of retail park car parks; at 10 metres from the boundary of a busy car park measured noise levels of 48 dB $L_{Aeq,1 \text{ hour}}$ (free field) have been found. During off peak trading periods, car park source noise levels can be approximately 5 dB lower.

Aldi car park

- 5.2 The closest proposed Aldi car parking spaces would be approximately 15 metres from the closest residential properties to the north in Water Street, indicated at Appendix A.
- 5.3 The resultant predicted car park activity noise level (during peak trading conditions) at the nearest properties on Water Street would be 45 dB $L_{Aeq,1 \text{ hour}}$; predicted noise levels from car parking during off peak trading conditions would be 40 dB $L_{Aeq,1 \text{ hour}}$.
- 5.4 Peak noise levels from car parking activity are associated with car door slam events. Typical car door slam has been measured at 66 dB L_{Amax} at 10 metres. At the properties on Water Street peak noise levels attributed to Aldi car park door slams would be 63 dB L_{Amax} .

Drive thru car park

- 5.5 The closest proposed car parking spaces associated with the drive thru would be approximately 25 metres from the closest residential properties to the north in Water Street, indicated at Appendix A.
- 5.6 The resultant predicted car park activity noise level (during peak trading conditions) at the nearest properties on Water Street would be 40 dB $L_{Aeq,1 \text{ hour}}$; predicted noise levels from car parking during off peak trading conditions would be 35 dB $L_{Aeq,1 \text{ hour}}$.
- 5.7 At the properties on Water Street peak noise levels attributed to drive thru car park door slams would be 58 dB L_{Amax} .
- 5.8 The predicted Aldi and drive thru car park noise levels are below the existing daytime ambient noise climate and below the WHO CNG daytime value. Predicted peak noise levels associated with Aldi car parking activity would exceed the WHO peak noise criterion. As such the Aldi store could trade between 0700 to 2300 hours without associated car parking noise giving rise to significant adverse impact, albeit Aldi stores generally operate within a maximum window of 0800 to 2200 hours.
- 5.9 In terms of peak noise levels associated with customer car parking at the proposed drive thru unit, these would be below the WHO peak noise criterion; as such the drive thru could trade on an unrestricted time basis (as does the existing McDonalds restaurant on the south side of Afan Way).

6.0 Noise from delivery activity

- 6.1 Delivery vehicles would enter the site from Water Street and then manoeuvre onto the Aldi loading bay.
- 6.2 Noise levels of the different components of delivery activity have been measured at similar Aldi stores, and the following maximum levels have been recorded.

TABLE 4: Delivery activity - baseline source noise levels (free field)

Event Noise Level (at 10 metres)						
Arrival		Unloading		Departure		Peak noise
Duration (mins)	L _{Aeq T} (dB)	Duration (mins)	L _{Aeq T} (dB)	Duration (mins)	L _{Aeq T} (dB)	L _{Amax} (dB)
2	69	45	58	0.5	67	75-78

- 6.3 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 are realistic worst case noise levels from a large collection of sample measurements and encompass all typical delivery activity noise (including reversing alarms, movement of goods, refrigeration units).
- 6.4 Table 5 below summarises the predicted ambient (L_{Aeq T}) delivery activity noise levels at the closest residential properties.

TABLE 5: Predicted delivery activity noise levels

Receptor	Predicted noise level dB L _{Aeq} 1 hour
40 Enfield Street	42
2 Ysguthan Road	46
188 Water Street	48

- 6.5 An assessment of delivery activity noise levels using the methodology in BS 4142:2014+A1:2019 is presented in Appendix C3. The table below summarises the comparison of the predicted delivery rating level and background noise climate.

TABLE 6: Summary of BS 4142:2014 assessment of daytime delivery activity noise

Receptor	Excess of rating level over daytime background level dB	BS 4142 guidance*
40 Enfield Street	-7 to -15	Indicative of low impact
Ysguthan Road	+2 to -5	Indicative of low to adverse impact
188 Water Street	+2 to -5	Indicative of low to adverse impact

*Depending on the context

- 6.6 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).
- 6.7 The BS 4142 assessment at Appendix C3 summarise the key contextual considerations in this instance. The first is how the predicted delivery activity noise levels compare to the WHO CNG values; the table below shows this comparison.

TABLE 7: Comparison of predicted delivery event noise levels with the WHO CNG values

Noise level	Parameter		
	L _{Aeq T}		
Receptor	40 Enfield Street	2 Ysguthan Road	188 Water Street
Predicted delivery event noise level day/night ^[1]	42/47	46/52	48/54
WHO guideline daytime/night time noise value ^[2]	55/45	55/45	55/45
Comply with WHO day/night time guidelines	YES/NO	YES/NO	YES/NO

Notes

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

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

- 6.8 Predicted delivery event noise levels comply with the WHO CNG daytime values.
- 6.9 The second key contextual consideration is how the predicted delivery activity noise levels compare to the existing ambient noise climate to consider the change in noise level.

TABLES 8 to 10: Change in noise level

Receptor	Date	Time	Noise level dB L _{Aeq 1 hour}				Noise impact
			Existing noise climate	Predicted delivery activity	Overall existing + predicted	Change in level	
40 Enfield Street	7.2.23	16:00	69	42	69	0.0	Low
		17:00	59	42	59	0.1	Low
		18:00	60	42	60	0.1	Low
		19:00	61	42	61	0.1	Low
		20:00	56	42	56	0.2	Low
		21:00	55	42	55	0.2	Low
		22:00	55	42	55	0.2	Low
	8.2.23	23:00	59	47	60	0.2	Low
		00:00	59	47	60	0.2	Low
		01:00	55	47	56	0.7	Low
		02:00	54	47	55	0.8	Low
		03:00	52	47	53	1.1	Low
		04:00	53	47	54	1.0	Low
		05:00	55	47	56	0.6	Low
		06:00	56	47	57	0.5	Low
		07:00	57	42	58	0.1	Low
		08:00	60	42	60	0.1	Low
		09:00	60	42	60	0.1	Low
		10:00	54	42	54	0.3	Low
		11:00	57	42	57	0.2	Low

Receptor	Date	Time	Noise level dB L _{Aeq 1 hour}				Noise impact
			Existing noise climate	Predicted delivery activity	Overall existing + predicted	Change in level	
2 Ysguthan Road	7.2.23	16:00	61	46	61	0.2	Low
		17:00	61	46	61	0.1	Low
		18:00	59	46	59	0.2	Low
		19:00	61	46	61	0.1	Low
		20:00	57	46	57	0.3	Low
		21:00	57	46	57	0.3	Low
		22:00	56	46	56	0.4	Low
	8.2.23	23:00	54	52	56	2.3	Low
		00:00	53	52	56	2.4	Low
		01:00	52	52	55	3.2	Slight
		02:00	52	52	55	2.9	Low
		03:00	51	52	55	3.3	Slight
		04:00	53	52	55	2.8	Low
		05:00	56	52	58	1.3	Low
		06:00	59	52	59	0.9	Low
		07:00	60	46	60	0.2	Low
		08:00	61	46	61	0.1	Low
		09:00	61	46	61	0.1	Low
		10:00	60	46	60	0.2	Low
		11:00	60	46	60	0.2	Low

Receptor	Date	Time	Noise level dB L _{Aeq 1 hour}				Noise impact
			Existing noise climate	Predicted delivery activity	Overall existing + predicted	Change in level	
188 Water Street	7.2.23	16:00	61	48	61	0.2	Low
		17:00	61	48	61	0.2	Low
		18:00	59	48	59	0.3	Low
		19:00	61	48	61	0.2	Low
		20:00	57	48	57	0.5	Low
		21:00	57	48	57	0.5	Low
		22:00	56	48	57	0.7	Low
	8.2.23	23:00	54	54	57	3.3	Slight
		00:00	53	54	57	3.4	Slight
		01:00	52	54	56	4.3	Slight
		02:00	52	54	56	3.9	Low
		03:00	51	54	56	4.5	Moderate
		04:00	53	54	56	3.8	Slight
		05:00	56	54	58	2.0	Low
		06:00	59	54	60	1.3	Low
		07:00	60	48	60	0.3	Low
		08:00	61	48	61	0.2	Low
		09:00	61	48	61	0.2	Low
		10:00	60	48	60	0.3	Low
		11:00	60	48	60	0.3	Low

- 6.10 The impact classification in the context of change in noise level for delivery activity occurring at any time is considered to be low to moderate.
- 6.11 Overall when considering the outcomes of all three assessment methods, it is concluded that deliveries could be made between 0700 to 2300 hours without associated noise giving rise to significant adverse impact.

7.0 Noise from 'drive-thru' activity

- 7.1 SR have previously undertaken measurements of customer activity and associated noise levels from drive-thru facilities at similar sites.
- 7.2 There are principally four events associated with a customer visit to the drive thru facility. These are arrival of a customer vehicle, the ordering of the food, followed by payment and collection and the movement along the access road to depart the site. These activities do not involve occupants leaving the vehicle, with the associated door slams, so peak noise levels are generated by the acceleration of the vehicle away from the order/collection windows.
- 7.3 The layout of the site would be such that the vehicles cannot travel at speed around the drive through loop. As such, noise levels generated by drive-thru facilities are not particularly high.
- 7.4 Measurements of these four activities, taken at a reference distance of 10 metres from the centre of activity gave the following typical noise levels:

TABLE 11: Drive-thru activity source noise levels

Activity	SEL	L _{AMAX}
Arrival of vehicle	72 dBA	63 dB
Ordering	70 dBA	61 dB
Collection/Payment	72 dBA	62 dB
Departure	72 dBA	63 dB

- 7.5 The SEL (single event or sound exposure level) is a parameter used to denote the sound energy of an event into a standard 1-second time period. This can then be used to convert a number of events of unknown or varying duration into a L_{Aeq T} ambient noise level.
- 7.6 The nearest residential properties are 148 Water Street to the north and 7 Green Park Street to the east.
- 7.7 Sharps Redmore has been supplied with average hourly 'drive thru' traffic flows for the proposed facility by The Magic Bean Company. The calculations presented in this assessment are based on the information given.

- 7.8 Using the forecasted customer vehicle movements the following overall noise levels are predicted (arrival, ordering, collection and departure) at 148 Water Street and 7 Green Park Street from the use of the drive-thru. The full calculations are presented at Appendix D.

TABLE 12: Predicted 'drive-thru' activity noise levels

Receptors	Noise level dB	
	L _{Aeq} 1 hour	L _{Amax}
148 Water Street	43	53
7 Green Park Street	42	52

- 7.9 The noise levels predicted to arise from proposed 'drive thru' activity fall well within the WHO guideline noise values for daytime and night time and are well below the existing noise climate at all times.
- 7.10 With regard to predicted drive thru noise levels it is concluded that the proposed drive thru could be used on an unrestricted 24 hour basis without associated noise giving rise to significant adverse impact, which is the planning test.

8.0 Assessment conclusions

- 8.1 Having undertaken this assessment against objective criteria, it is concluded that the proposed development could proceed without the likelihood of noise from subsequent operations giving rise to significant adverse impact, on the basis of the following operating hours:

Store trading: 0700 to 2300 hours;

Servicing: 0700 to 2300 hours;

Drive-thru: Unrestricted.

- 8.2 Fixed plant equipment can be designed such that the suggested criteria in the table below are achieved at the nearest noise sensitive properties.

TABLE 13: Proposed plant rating noise limits

Rating level limits (dB)	
Daytime	Night time
42	39

- 8.3 The following planning condition is recommended to secure the above criteria:

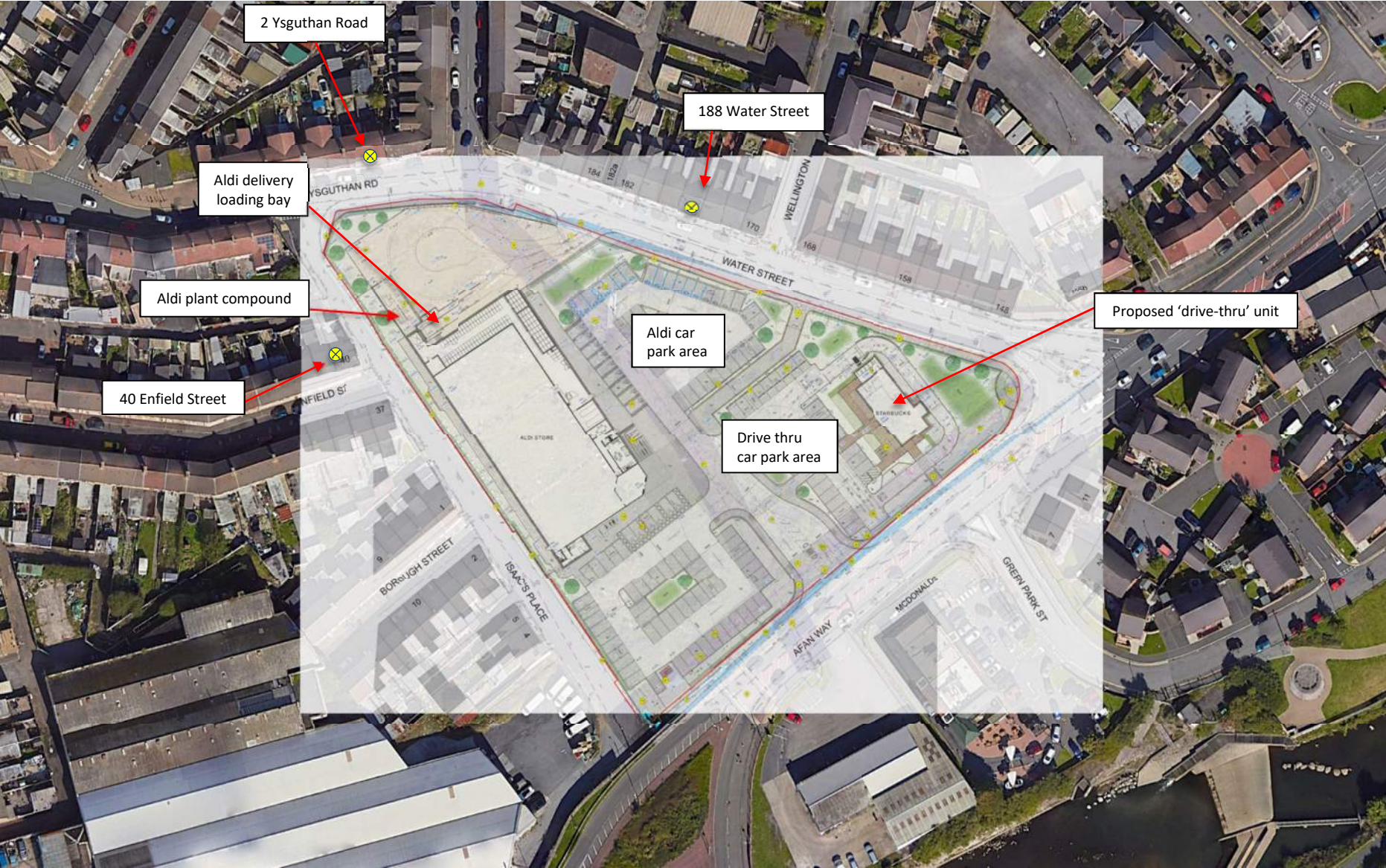
"No fixed plant and/or machinery shall come into operation until details of the fixed plant and machinery serving the development hereby permitted, and any mitigation measures to achieve this condition, are submitted to and approved in writing by the local planning authority. The rating level of the plant sound emitted from the site shall not exceed 42 dBA between 0700 and 2300 hours and 39 dBA at all other times. The sound levels shall be determined by measurement or calculation at the nearest noise sensitive premises. The measurements and assessment shall be made according to BS 4142:2014+A1:2019."

- 8.4 The proposed 'drive-thru' activity noise levels are predicted to be significantly below both the existing ambient noise climate and the WHO daytime and night time guideline noise values.
- 8.5 In summary, based on a thorough assessment against objective standards, noise associated with the proposed Aldi store and 'drive-thru' facility would comply with the objectives of PPW to *"prevent adverse effects to amenity, health and the environment..."*.

APPENDIX A

SITE LOCATION PLAN

Appendix A: Site location plan



APPENDIX B

NOISE SURVEY RESULTS

**Summary of measured noise levels at Water Street, Port Talbot, Tuesday 7th February to
Wednesday 8th February**

Date	Sample start time	Noise Parameter - dB				
		L _{Aeq,T}	L _{AFmax}	L _{AFmin}	L _{A10,T}	L _{A90,T}
7.2.23	15:30	59.7	84.0	48.8	63.2	51.5
	15:45	60.0	74.9	48.9	63.5	53.2
	16:00	60.0	77.1	49.8	63.7	53.3
	16:15	61.6	85.2	48.3	64.3	53.3
	16:30	60.4	83.3	50.7	63.3	52.6
	16:45	59.6	75.8	48.2	62.7	51.2
	17:00	60.1	79.8	48.2	63.7	51.5
	17:15	59.7	77.0	47.5	63.4	51.0
	17:30	60.5	83.2	47.5	63.7	51.2
	17:45	61.9	82.0	45.3	64.5	49.9
	18:00	59.2	72.1	45.6	63.3	49.7
	18:15	59.0	73.0	45.3	63.5	49.0
	18:30	58.3	75.6	46.1	62.5	48.8
	18:45	58.8	77.8	46.1	62.8	49.1
	19:00	63.1	91.7	47.6	63.6	50.7
	19:15	58.4	73.7	49.8	61.9	51.7
	19:30	61.2	86.2	48.5	62.0	51.6
	19:45	57.6	74.1	49.5	61.1	51.3
	20:00	56.0	73.8	47.9	59.4	50.3
	20:15	58.0	76.1	48.6	61.4	51.1
	20:30	56.4	73.7	49.0	59.3	51.1
	20:45	56.9	71.5	49.0	60.5	51.3
	21:00	56.9	74.4	49.5	59.2	51.1
	21:15	58.7	85.8	48.4	58.3	50.9
	21:30	55.3	72.1	48.5	57.2	50.8
	21:45	56.0	71.5	48.7	59.1	50.4
	22:00	57.1	69.4	48.5	61.2	50.7
	22:15	56.5	69.8	48.7	60.5	50.7
	22:30	54.6	71.4	48.5	55.9	50.4
	22:45	54.2	70.6	49.0	55.5	50.6
	23:00	52.6	66.6	47.8	53.8	50.1
	23:15	53.6	69.0	47.6	54.3	49.3
	23:30	53.6	70.2	47.7	54.1	50.3
	23:45	54.0	71.6	48.5	54.3	50.2
8.2.23	00:00	53.2	67.6	48.4	53.6	50.3
	00:15	53.8	72.4	48.8	53.6	50.5
	00:30	53.1	65.8	49.1	54.1	50.9
	00:45	52.9	66.9	49.8	53.5	51.4
	01:00	53.2	63.3	49.4	54.5	51.2
	01:15	51.7	62.6	47.9	52.9	50.0
	01:30	50.4	55.0	47.0	52.1	48.8
	01:45	50.8	64.4	47.6	51.5	49.1
	02:00	52.2	69.3	48.6	51.9	50.0
	02:15	53.2	68.5	49.2	52.8	50.5
	02:30	52.2	65.5	49.4	52.9	50.7
	02:45	51.3	54.9	48.5	52.1	50.3
	03:00	51.3	62.0	48.2	52.3	50.0
	03:15	51.3	67.0	47.5	51.8	49.0
	03:30	52.6	67.9	49.0	52.8	50.6
	03:45	50.2	58.4	46.7	52.1	48.1
	04:00	51.4	63.1	47.4	52.0	49.6
	04:15	52.3	66.7	48.7	52.9	50.1

**Summary of measured noise levels at Water Street, Port Talbot, Tuesday 7th February to
Wednesday 8th February**

Date	Sample start time	Noise Parameter - dB				
		L _{Aeq,T}	L _{AFmax}	L _{AFmin}	L _{A10,T}	L _{A90,T}
8.2.23	04:30	54.2	68.7	47.6	54.9	50.0
	04:45	51.7	66.3	47.1	52.4	48.8
	05:00	53.8	68.2	49.9	55.1	51.3
	05:15	56.5	74.9	50.2	58.2	52.1
	05:30	57.7	69.9	52.3	61.0	53.7
	05:45	56.9	71.1	50.8	59.2	53.0
	06:00	57.7	70.9	50.8	60.6	52.7
	06:15	58.5	72.0	51.8	62.1	53.3
	06:30	59.0	78.2	51.7	61.6	53.4
	06:45	58.7	73.4	52.6	61.6	53.9
	07:00	58.8	76.8	52.6	61.8	54.0
	07:15	59.3	71.7	52.8	63.1	54.1
	07:30	60.5	80.6	53.6	63.2	55.2
	07:45	61.4	78.9	53.3	64.8	55.2
	08:00	60.4	80.8	53.2	63.3	55.3
	08:15	60.3	74.0	53.8	64.0	55.3
	08:30	62.3	73.6	54.5	65.9	56.0
	08:45	61.1	73.0	53.3	64.8	55.3
	09:00	60.7	74.0	52.6	64.1	54.8
	09:15	61.6	79.0	52.9	64.6	55.8
	09:30	60.7	76.0	54.0	64.4	55.6
	09:45	60.8	76.9	51.1	64.1	53.6
	10:00	60.0	75.3	50.7	63.7	53.0
	10:15	59.4	79.0	50.2	63.0	52.6
	10:30	60.0	77.1	49.5	63.2	52.1
	10:45	60.9	77.6	48.7	63.8	52.0
	11:00	59.6	74.5	49.0	63.3	51.7
	11:15	59.4	73.6	50.2	62.8	53.0
	11:30	59.5	74.6	50.5	62.6	53.3
	11:45	60.8	74.9	51.5	64.0	53.7

**Summary of measured noise levels at Isaac Place, Port Talbot, Tuesday 7th February to
Wednesday 8th February**

Date	Sample start time	Noise Parameter - dB				
		L _{Aeq,T}	L _{AFmax}	L _{AFmin}	L _{A10,T}	L _{A90,T}
7.2.23	16:00	56.5	80.8	47.4	54.2	50.0
	16:15	68.0	97.7	47.3	72.7	50.4
	16:30	71.2	92.1	47.7	75.8	50.9
	16:45	70.5	98.3	48.0	76.0	50.7
	17:00	62.0	88.8	47.4	56.6	49.7
	17:15	56.9	71.3	49.5	59.3	52.7
	17:30	56.9	84.2	49.0	58.0	52.2
	17:45	57.2	79.5	48.2	55.8	50.8
	18:00	55.1	66.1	48.6	57.4	52.0
	18:15	54.5	61.5	48.4	56.3	52.1
	18:30	55.2	63.4	49.1	57.3	51.8
	18:45	65.1	102.3	49.4	60.3	52.1
	19:00	65.7	74.6	53.3	68.8	56.6
	19:15	56.4	80.8	52.2	57.2	54.2
	19:30	56.9	80.8	52.0	58.7	53.8
	19:45	57.6	75.0	51.3	57.0	52.9
	20:00	56.8	84.6	51.0	57.5	52.8
	20:15	56.3	68.4	50.6	58.9	52.8
	20:30	54.3	67.0	50.1	55.6	52.2
	20:45	54.8	68.1	50.0	56.6	52.3
	21:00	55.6	68.4	50.5	58.3	52.5
	21:15	53.5	66.2	49.3	54.6	51.7
	21:30	53.7	62.5	49.7	55.2	51.8
	21:45	56.5	66.0	49.7	59.5	52.6
	22:00	55.3	69.8	49.6	57.0	52.5
	22:15	54.7	65.6	49.5	57.2	51.6
	22:30	55.1	76.5	49.0	57.4	51.4
	22:45	54.1	61.0	48.9	56.3	51.4
	23:00	55.5	71.8	48.1	58.0	51.6
	23:15	54.3	63.0	48.3	56.3	51.6
	23:30	61.6	86.0	48.9	65.4	52.6
	23:45	61.6	84.7	49.0	64.3	54.1
8.2.23	00:00	59.1	69.3	51.2	62.2	54.3
	00:15	57.2	71.0	50.0	59.8	53.1
	00:30	59.1	73.1	50.6	62.6	53.7
	00:45	61.2	85.0	50.0	63.5	55.4
	01:00	55.2	82.0	49.3	56.8	51.5
	01:15	56.7	76.0	49.3	58.8	53.3
	01:30	54.0	79.8	47.6	55.9	50.0
	01:45	52.5	58.5	48.4	54.2	50.4
	02:00	54.8	77.7	49.3	56.4	51.7
	02:15	53.8	77.0	48.1	55.5	50.6
	02:30	52.3	58.3	47.8	54.1	50.1
	02:45	53.6	75.0	48.4	55.9	50.1
	03:00	53.3	76.3	48.3	54.6	50.7
	03:15	51.4	55.8	47.9	52.9	49.8
	03:30	52.1	62.2	48.9	53.4	50.5
	03:45	51.6	73.4	46.5	53.1	49.0
	04:00	53.0	69.2	47.3	54.7	50.1
	04:15	52.8	65.7	48.3	54.1	50.4
	04:30	53.3	68.3	48.7	54.7	51.3
	04:45	53.0	57.6	48.7	54.2	51.2

**Summary of measured noise levels at Isaac Place, Port Talbot, Tuesday 7th February to
Wednesday 8th February**

Date	Sample start time	Noise Parameter - dB				
		L _{Aeq,T}	L _{AFmax}	L _{AFmin}	L _{A10,T}	L _{A90,T}
8.2.23	05:00	53.7	69.8	50.8	54.8	52.4
	05:15	55.3	66.8	51.3	56.8	53.3
	05:30	56.8	71.1	54.2	57.7	55.6
	05:45	55.1	61.1	52.7	56.2	53.9
	06:00	55.1	65.4	51.8	56.1	53.6
	06:15	55.1	68.0	51.9	56.2	53.5
	06:30	55.7	68.8	52.9	56.5	54.5
	06:45	58.0	76.8	53.7	58.2	55.4
	07:00	56.7	61.1	54.6	57.7	55.8
	07:15	57.8	81.2	54.8	58.2	56.2
	07:30	57.3	72.1	54.6	58.1	56.0
	07:45	57.6	68.4	54.9	58.9	56.2
	08:00	59.0	78.8	55.3	59.8	57.2
	08:15	59.2	72.8	56.1	60.1	57.5
	08:30	60.2	77.0	57.1	60.8	58.5
	08:45	60.1	75.7	57.4	61.5	58.7
	09:00	60.2	79.1	54.7	61.9	57.3
	09:15	61.0	83.1	55.6	61.1	57.7
	09:30	60.3	75.0	55.7	61.8	57.8
	09:45	58.1	84.8	49.9	58.9	51.6
	10:00	55.5	77.2	47.6	55.2	49.8
	10:15	52.9	78.2	48.8	53.7	50.1
	10:30	52.3	71.7	48.6	53.4	50.2
	10:45	54.7	78.4	47.6	54.3	49.7
	11:00	56.6	77.0	47.9	56.1	49.7
	11:15	54.1	74.8	46.1	54.8	50.1
	11:30	54.7	75.5	47.8	55.4	49.7
	11:45	58.9	78.5	48.6	60.6	50.9

APPENDIX C

PREDICTED DELIVERY EVENT NOISE LEVELS AND BS 4142 ASSESSMENT

Appendix C1: Predicted delivery activity noise levels

APPENDIX C1.1

Assessment project: Aldi, Port Talbot	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels ($L_{Aeq,T}$) *			
Closest residential property address:	40 Enfield Street		
Source noise level at 10 metres $L_{Aeq,T}$	69	58	67
Time - minutes	2	45	0.5
Distance between noise source and residential property in metres	46.6	25.5	46.6
Screening attenuation dB	0	16	0
Convert to 1 hour - dB	-15	-1	-21
Convert to 15 mins - dB	-9	5	-15
Distance attenuation correction - dB	-13	-8	-13
Activity $L_{Aeq,1\text{ hr}}$	41	33	33
Activity $L_{Aeq,15\text{ mins}}$	47	39	-
Rating level correction	0	6	0
Resultant daytime rating level $L_{Ar,Tr}$	41	39	33
Resultant nighttime rating level $L_{Ar,Tr}$	47	45	-
Overall delivery activity noise (arrival, unloading, departure) dB $L_{Aeq,1\text{ hr}}$	42 dB		
Overall delivery activity noise (arrival + unloading) dB $L_{Aeq,15\text{ mins}}$	47 dB		
Rating level dB $L_{Aeq,1\text{ hr}}$	43 dB		
Rating level dB $L_{Aeq,15\text{ mins}}$	49 dB		

APPENDIX C1.2

Assessment project: Aldi, Port Talbot	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels ($L_{Aeq,T}$) *			
Closest residential property address:	2 Ysguthan Road		
Source noise level at 10 metres $L_{Aeq,T}$	69	58	67
Time - minutes	2	45	0.5
Distance between noise source and residential property in metres	47.2	43.2	47.2
Screening attenuation dB	0	0	0
Convert to 1 hour - dB	-15	-1	-21
Convert to 15 mins - dB	-9	5	-15
Distance attenuation correction - dB	-13	-13	-13
Activity $L_{Aeq,1\text{ hr}}$	41	44	33
Activity $L_{Aeq,15\text{ mins}}$	47	50	-
Rating level correction	0	6	0
Resultant daytime rating level $L_{Ar,Tr}$	41	50	33
Resultant nighttime rating level $L_{Ar,Tr}$	47	56	-
Overall delivery activity noise (arrival, unloading, departure) dB $L_{Aeq,1\text{ hr}}$	46 dB		
Overall delivery activity noise (arrival + unloading) dB $L_{Aeq,15\text{ mins}}$	52 dB		
Rating level dB $L_{Aeq,1\text{ hr}}$	51 dB		
Rating level dB $L_{Aeq,15\text{ mins}}$	57 dB		

APPENDIX C1.3

Assessment project: Aldi, Port Talbot	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels ($L_{Aeq,T}$) *			
Closest residential property address:	188 Water Street		
Source noise level at 10 metres $L_{Aeq,T}$	69	58	67
Time - minutes	2	45	0.5
Distance between noise source and residential property in metres	25.9	47.4	25.9
Screening attenuation dB	0	0	0
Convert to 1 hour - dB	-15	-1	-21
Convert to 15 mins - dB	-9	5	-15
Distance attenuation correction - dB	-8	-14	-8
Activity $L_{Aeq,1\text{ hr}}$	46	43	38
Activity $L_{Aeq,15\text{ mins}}$	52	49	-
Rating level correction	0	6	0
Resultant daytime rating level $L_{Ar,Tr}$	46	49	38
Resultant nighttime rating level $L_{Ar,Tr}$	52	55	-
Overall delivery activity noise (arrival, unloading, departure) dB $L_{Aeq,1\text{ hr}}$	48 dB		
Overall delivery activity noise (arrival + unloading) dB $L_{Aeq,15\text{ mins}}$	54 dB		
Rating level dB $L_{Aeq,1\text{ hr}}$	51 dB		
Rating level dB $L_{Aeq,15\text{ mins}}$	57 dB		

Appendix C2: Barrier Attenuation Calculations

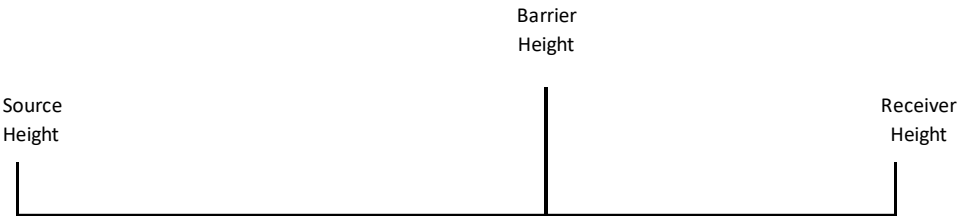
Appendix C2.1

BASIC BARRIER ATTENUATION

(based on Maekawa or CRTN)

Receptor: **40 Enfield Street**
Project: **Aldi, Port Talbot**

Source: **Delivery activity: unloading** Receiver: **40 Enfield Street**



Source-to-Barrier Distance

Receiver-to-Barrier Distance

Source-to-Barrier Distance	5.0 m
Receiver-to-Barrier Distance	20.5 m

Source Height	1.0 m
Receiver Height	4.5 m
Barrier Height	5.0 m

Store Building

Path difference = 1.170 m

Frequency - Hz	63	125	250	500	1K	2K	4K	8K	CRTN
Attenuation - dB	10.6	13.0	15.7	18.5	21.4	24.4	27.4	30.4	16.0 dBA

Appendix C3: Assessment of delivery activity noise using BS 4142:2014

APPENDIX C3.1

Results	Time period												Relevant clause	Commentary
	7.2.23						8.2.23							
	16:00-17:00	17:00-18:00	18:00-19:00	19:00-20:00	20:00-21:00	21:00-22:00	22:00-23:00	07:00-08:00	08:00-09:00	09:00-10:00	10:00-11:00	11:00-12:00		
Receptor	40 Enfield Street													
Background sound level dB (L _{A90})	51 dB	51 dB	52 dB	54 dB	53 dB	52 dB	52 dB	56 dB	58 dB	56 dB	50 dB	50 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	42 dB	42 dB	42 dB	42 dB	42 dB	42 dB	42 dB	42 dB	42 dB	42 dB	42 dB	42 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 correction of +6 dB is applied within delivery calculation to unloading component												9.2	+6 dB rating level correction applied for clearly perceptible impulsivity from bangs and crashes of unloading activity.
Rating level	43 dB	43 dB	43 dB	43 dB	43 dB	43 dB	43 dB	43 dB	43 dB	43 dB	43 dB	43 dB	9.2	
Background sound level	51 dB	51 dB	52 dB	54 dB	53 dB	52 dB	52 dB	56 dB	58 dB	56 dB	50 dB	50 dB	8.1	
Excess of rating level over background level	-8	-8	-9	-11	-10	-9	-9	-13	-15	-13	-7	-7	11	
Assessment is indicative of low impact	Relevant clause 11 The context is: 1. Predicted delivery event noise levels (L _{Aeq 1 hour}) are below the WHO Community Noise daytime guideline value. 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 -7 dB and -15 dB.													
	Uncertainty of the delivery noise source data is reduced by the large sample of delivery activity noise collected at numerous Aldi stores nationwide.													

APPENDIX C3.2

Results	Time period												Relevant clause	Commentary
	7.2.23						8.2.23							
	16:00-17:00	17:00-18:00	18:00-19:00	19:00-20:00	20:00-21:00	21:00-22:00	22:00-23:00	07:00-08:00	08:00-09:00	09:00-10:00	10:00-11:00	11:00-12:00		
Receptor	2 Ysguthan Road													
Background sound level dB (L _{A90})	53 dB	51 dB	49 dB	51 dB	51 dB	51 dB	51 dB	55 dB	56 dB	55 dB	52 dB	53 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	46 dB	46 dB	46 dB	46 dB	46 dB	46 dB	46 dB	46 dB	46 dB	46 dB	46 dB	46 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 correction of +6 dB is applied within delivery calculation to unloading component												9.2	+6 dB rating level correction applied for clearly perceptible impulsivity from bangs and crashes of unloading activity.
Rating level	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	9.2	
Background sound level	53 dB	51 dB	49 dB	51 dB	51 dB	51 dB	51 dB	55 dB	56 dB	55 dB	52 dB	53 dB	8.1	
Excess of rating level over background level	-2	0	+2	0	0	0	0	-4	-5	-4	-1	-2	11	
Assessment is indicative of low to adverse impact	Relevant clause 11 The context is: 1. Predicted delivery event noise levels (L _{Aeq 1 hour}) are below the WHO Community Noise daytime guideline value. 2. The predicted delivery event noise levels are generally below or match 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 +2 dB and -5 dB.													
	Uncertainty of the delivery noise source data is reduced by the large sample of delivery activity noise collected at numerous Aldi stores nationwide.													

APPENDIX C3.3

Results	Time period												Relevant clause	Commentary
	7.2.23						8.2.23							
	16:00-17:00	17:00-18:00	18:00-19:00	19:00-20:00	20:00-21:00	21:00-22:00	22:00-23:00	07:00-08:00	08:00-09:00	09:00-10:00	10:00-11:00	11:00-12:00		
Receptor	188 Water Street													
Background sound level dB (L _{A90})	53 dB	51 dB	49 dB	51 dB	51 dB	51 dB	51 dB	55 dB	56 dB	55 dB	52 dB	53 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	48 dB	48 dB	48 dB	48 dB	48 dB	48 dB	48 dB	48 dB	48 dB	48 dB	48 dB	48 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 correction of +6 dB is applied within delivery calculation to unloading component												9.2	+6 dB rating level correction applied for clearly perceptible impulsivity from bangs and crashes of unloading activity.
Rating level	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	51 dB	9.2	
Background sound level	53 dB	51 dB	49 dB	51 dB	51 dB	51 dB	51 dB	55 dB	56 dB	55 dB	52 dB	53 dB	8.1	
Excess of rating level over background level	-2	0	+2	0	0	0	0	-4	-5	-4	-1	-2	11	
Assessment is indicative of low to adverse impact	Relevant clause 11 The context is: 1. Predicted delivery event noise levels (L _{Aeq 1 hour}) are below the WHO Community Noise daytime guideline value. 2. The predicted delivery event noise levels are generally below or match 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 +2 dB and -5 dB.													
	Uncertainty of the delivery noise source data is reduced by the large sample of delivery activity noise collected at numerous Aldi stores nationwide.													

APPENDIX D

'DRIVE-THRU' CALCULATIONS

APPENDIX D1.1: Drive thru ambient noise (L_{Aeq,T}) level predictions: average daily flows: 148 Water Street

Activity	SEL at 10 metres	No. of events ^[1]	L _{Aeq 1 hour} at 10 metres	Distance to receptor (metres)	Distance attenuation (dB)	Screening attenuation (dB) ^[2]	L _{Aeq 1 hour} at receptor	Overall dB L _{Aeq 1 hour}
Arrival of vehicle	72 dB	20	49 dB	56 m	-15 dB	0 dB	34 dB	43 dB
Ordering	70 dB	20	47 dB	31 m	-10 dB	0 dB	38 dB	
Collection of order	72 dB	20	49 dB	28 m	-9 dB	0 dB	41 dB	
Departure of vehicle	72 dB	20	49 dB	52 m	-14 dB	-5 dB	30 dB	

[1] Based on average hourly traffic flows
[2] 10dB reduction for full screening, 5dB reduction for partial screening, 0dB reduction for no screening

PEAK NOISE

Activity	L _{Amax} at 10 metres	Distance to receptor (metres)	Distance attenuation (dB)	Screening attenuation (dB) *	L _{Amax} at receptor	Highest dB L _{Amax}
Arrival of vehicle	63 dB	56 m	-15 dB	0 dB	48 dB	53 dB
Ordering	61 dB	31 m	-10 dB	0 dB	51 dB	
Collection of order	62 dB	28 m	-9 dB	0 dB	53 dB	
Departure of vehicle	63 dB	52 m	-14 dB	-5 dB	44 dB	

APPENDIX D1.2: Drive thru ambient noise (L_{Aeq,T}) level predictions: average daily flows: 7 Green Park Street

Activity	SEL at 10 metres	No. of events ^[1]	L _{Aeq 1 hour} at 10 metres	Distance to receptor (metres)	Distance attenuation (dB)	Screening attenuation (dB) ^[2]	L _{Aeq 1 hour} at receptor	Overall dB L _{Aeq 1 hour}
Arrival of vehicle	72 dB	20	49 dB	68 m	-17 dB	0 dB	33 dB	42 dB
Ordering	70 dB	20	47 dB	57 m	-15 dB	0 dB	32 dB	
Collection of order	72 dB	20	49 dB	40 m	-12 dB	0 dB	37 dB	
Departure of vehicle	72 dB	20	49 dB	36 m	-11 dB	0 dB	38 dB	

[1] Based on average hourly traffic flows
[2] 10dB reduction for full screening, 5dB reduction for partial screening, 0dB reduction for no screening

PEAK NOISE

Activity	L _{Amax} at 10 metres	Distance to receptor (metres)	Distance attenuation (dB)	Screening attenuation (dB) *	L _{Amax} at receptor	Highest dB L _{Amax}
Arrival of vehicle	63 dB	68 m	-17 dB	0 dB	46 dB	52 dB
Ordering	61 dB	57 m	-15 dB	0 dB	46 dB	
Collection of order	62 dB	40 m	-12 dB	0 dB	50 dB	
Departure of vehicle	63 dB	36 m	-11 dB	0 dB	52 dB	

APPENDIX E

ACOUSTIC TERMINOLOGY

Acoustic Terminology

- E1 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.

- E2 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.

- E3 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).

- E4 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 .

- E5 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.

- E6 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.

- E7** 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.

- E8** 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:

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