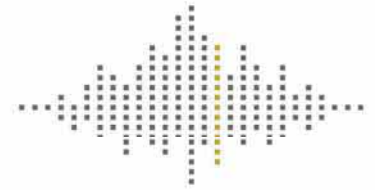


SHARPS REDMORE

ACOUSTIC CONSULTANTS • Established 1990



Report

Date 16th February 2024
Project No 2322180

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Contents

- 1.0 Introduction
- 2.0 Assessment methodology and criteria
- 3.0 Noise survey details
- 4.0 Noise from fixed plant equipment
- 5.0 Noise from customer car parking activity
- 6.0 Noise from delivery activity
- 7.0 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 Sharps Redmore (SR) has been instructed to undertake a noise assessment of a proposed Aldi store at the former Co-op site at Mafon Road, Nelson, Caerphilly.
- 1.2 The proposal is for the erection of a new Aldi foodstore with associated fixed plant equipment, customer car parking provision and a delivery loading bay, at the Mafon Road site. The closest noise sensitive receptors to the proposed Aldi store are to the north at 5 Hoel Harri Lewis and 14 Taf Olwg, and in Llanfabon Road to the west (as 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 would affect residential amenity. Based on experience of similar retail developments, the following main impacts have been identified:
- Noise from fixed mechanical services plant;
 - Noise from servicing activity;
 - Noise from car parking activity;
- 1.4 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.
- 1.5 As assessment of noise from the operational of the proposed Aldi development is presented in sections 4 to 6; the assessment conclusions are contained in section 7.

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. British Standard (BS) 8233:2014 and World Health Organisation (WHO) “Guidelines for Community Noise” contain such guidelines.
 - ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.
 - iii) Another method is to compare the resultant sound level against the background sound level (L_{A90}) of the area. This is the method employed by

BS 4142:2014+A1:2019 to determine the significance of sound impact from sources of industrial and/or commercial nature. The sources that the new 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 Guidelines for Community Noise (GCN, or “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 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 (or GCN) 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 (GCN) noise values are summarised in the following table:

TABLE 1: WHO GCN 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:
- i) Determine the background sound levels, in terms of the index L_{A90} , at the receptor locations of interest.
 - ii) 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.
 - iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
 - iv) 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.

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”.

2.15 BS 4142:2014 introduces 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).

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

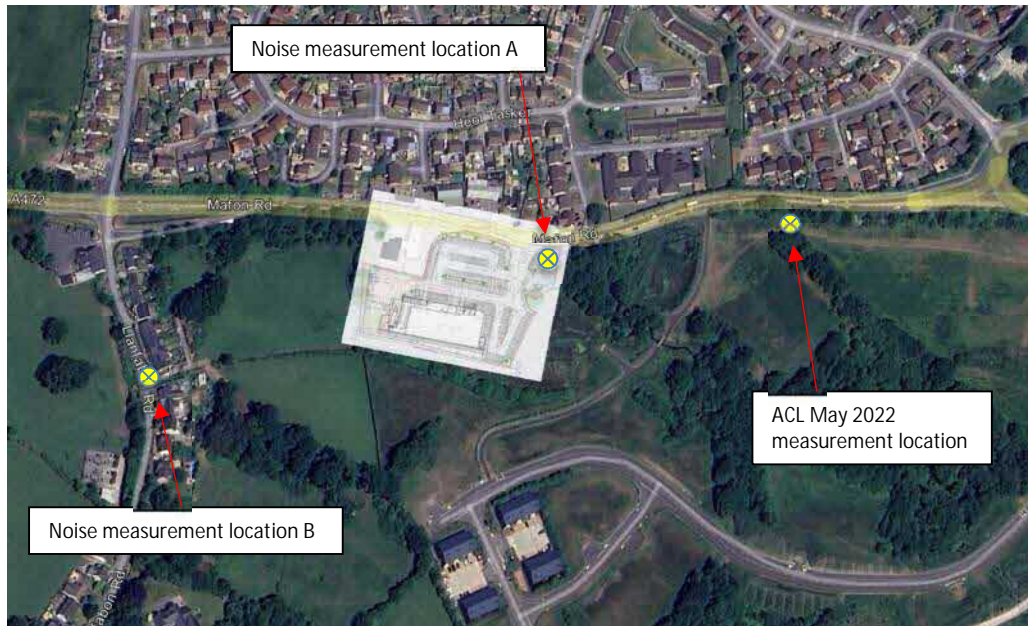
- The absolute level of sound;
- The character and level of the specific sound in the context of the existing noise climate; for example, is the sound to occur in a location already characterised by similar activities as those proposed?
- The sensitivity of the receptors;
- The time and duration that 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;

2.16 It is therefore entirely possible that whilst the numerical outcome/initial estimate of a BS 4142:2014 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 A baseline noise survey was carried out between Tuesday 12th and Wednesday 13th December 2023 at a two measurement locations representative of the noise climate in the vicinity of the proposed Aldi site. The measurement locations are indicated at Figure 1 below.

FIGURE 1: Noise measurement locations



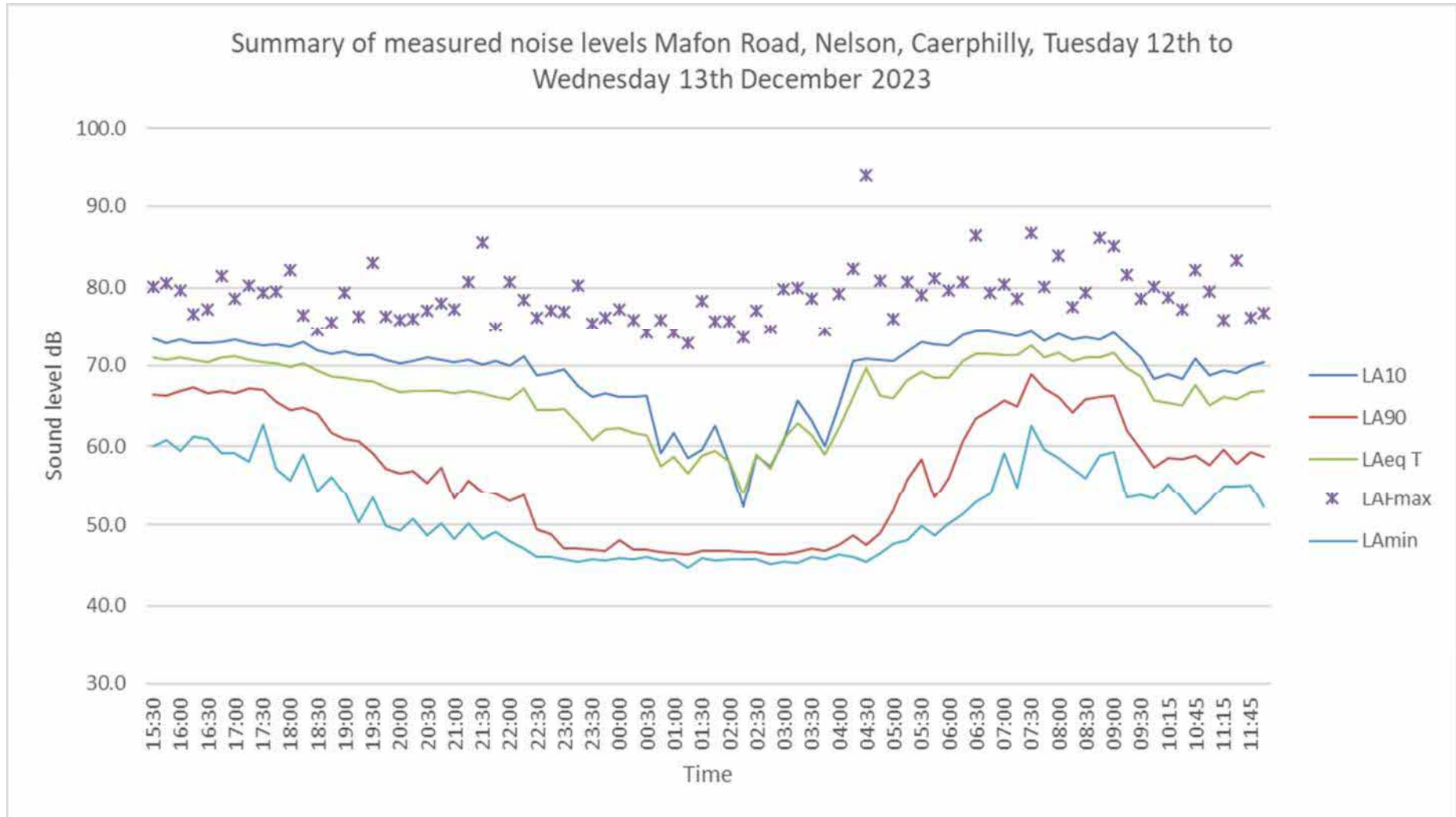
- 3.2 The weather conditions during the survey were dry; during the equipment set up and collection, weather conditions were cloudy and overcast, with temperatures between 6-10°C and light winds (<5m/s) mainly from the north. Weather conditions are not considered to have materially affected the measured noise levels during the survey.
- 3.3 The unattended baseline noise measurements were carried out using a Norsonic 140 sound level meter fitted with an environmental microphone kit, and Norsonic 118 sound level meter, which was used for the short term attended measurements. The sound level meters were calibrated at the start and end of the survey and no variation in levels were observed. The baseline noise measurements were taken over 15 minute sample periods.
- 3.4 Measurements were taken in free field conditions with the microphone positioned approximately 1.5 metres above local ground level.
- 3.5 The noise survey was undertaken during the late afternoon, through to mid-morning the following day. This period was selected to obtain an indication as to typical daytime, evening and night time noise climate. There is a gap in the measurements between 0930 and 1000 hours, as the batteries ran out of charge, and were replaced.

- 3.6 At measurement location A the noise climate was principally dominated by local road traffic sources on Mafon Road, during the late evening plant noise from the existing Co op store was the dominant source, which prevented the background from dropping overnight. Once the Co op plant became the dominant source, a series of short-term measurements (measurement location B) were taken away from the influence of noise from the Co op plant, to the west of the Aldi site in Llanfabon Road.
- 3.7 Due to the short term nature of the attended survey at measurement location B, and the uncertainty that the short duration of these measurements may bring, the noise report (prepared by Acoustic Consultants Limited) for the adjacent proposed future residential development at Ty Du has also been reviewed. This review has been conducted to compare the night time background noise levels measured during the SR noise survey, with those measured in May 2022.
- 3.8 The measured baseline noise levels are summarised in Table 3 and in Figure 2 below, and are presented in full at Appendix B.

TABLE 3: Summary of measured noise levels (measurement location A)

Date	Time	Noise level dB		
		L _{A90} 1 hour	L _{A90} 15 mins	L _{Aeq} 1 hour
12.12.23	15:00	66.3		70.8
	16:00	66.9		70.8
	17:00	66.5		70.6
	18:00	63.8		69.5
	19:00	59.5		68.0
	20:00	56.6		66.8
	21:00	54.3		66.5
	22:00	51.2		65.6
	23:00			46.8
13.12.23	00:00		46.6	61.0
	01:00		46.3	58.5
	02:00		46.3	57.5
	03:00		46.4	61.3
	04:00		47.5	66.8
	05:00		51.8	68.1
	06:00		56.0	70.6
	07:00	66.6		71.5
	08:00	65.6		71.0
	09:00	62.6		70.1
	10:00	58.3		66.1
	11:00	58.6		66.0
	12:00	58.7		66.9

FIGURE 2: Summary of measured noise levels



Date	Time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
12.12.23	22:00	58.9	41.2	56.7	71.3	40.1
13.12.23	02:00	48.9	35.8	47.6	63.2	33.8
	02:15	48.7	36.0	47.3	60.2	33.6

- 3.14 The ACL noise survey established typical daytime background noise levels of 53 dB L_{A90} , and 25 dB L_{A90} at night.
- 3.15 In relation to the SR noise monitoring equipment full details and calibration certificates are available on request.

4.0 Noise from fixed plant equipment

- 4.1 The precise details of the fixed plant equipment for the proposed Aldi store are to be finalised, however, the fixed plant is likely to comprise of a mixture of refrigeration and ventilation equipment. The refrigeration plant compound is indicated to be located on the south side of the store to the rear of the delivery loading bay. From a noise point of view this is the optimum location for the plant compound which will afford good distance separation to nearby receptors. 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 background sound levels.
- 4.2 The closest existing noise sensitive receptors to the proposed Aldi fixed plant compound would be in Taf Olwg to the north and the residential receptors in Llanfabon Road to the west. Future residential receptors at the Ty Du site would be a significant distance from the Aldi plant compound and extensively screened by the store building.
- 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 Hence in relation to the guidance above from BS 4142:2014 there is a robust technical case to seek to set plant sound limits that match the typical background sound climate. As identified in section 3, the typical daytime background noise level at the properties along Mafon Road (including Taf Olwg) is considered to be 53 dB L_{A90} , whilst the typical night time background noise level is 25 dB L_{A90} . The typical measured background noise levels at Llanfabon Road to the west were 41 dB L_{A90} daytime and 36 dB L_{A90} at night.
- 4.6 Given the very low background noise levels in the vicinity of this site (in the absence of noise from the Co op plant equipment) it is proposed to adopt plant rating noise level limits of 41 dB daytime and 30 dB at night.

4.7 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 sound emitted from the site shall not exceed 41 dBA between 0700 and 2300 hours, and 30 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 store 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.
- 5.2 The closest Aldi car parking spaces would be approximately 50 metres from 5 Heol Harri Lewis to the north of the proposed Aldi site. The closest future residential properties at the Ty Du development would be approximately 130 metres away to the east.
- 5.3 The resultant predicted car park activity noise level (during peak trading conditions) at 5 Heol Harri Lewis would be 34 dB $L_{Aeq,1 \text{ hour}}$ (based on $48 - 20 \cdot \log[10/50] = -14$ dB); predicted noise levels from car parking during off peak trading conditions would be 29 dB $L_{Aeq,1 \text{ hour}}$. At the proposed future residential properties to the east (Ty Du), predicted car parking activity noise levels would be 26 dB $L_{Aeq,1 \text{ hour}}$ (based on $48 - 20 \cdot \log[10/130] = -22$ dB) during peak trading hours, and 21 dB $L_{Aeq,1 \text{ hour}}$ during off peak trading conditions.
- 5.4 The predicted car park noise levels are significantly below the existing daytime ambient noise climate and well below the WHO CNG daytime and night time values. On this basis the Aldi store could trade on an unrestricted basis without giving rise to significant adverse impact. There is no requirement, on noise impact grounds, for the local authority to seek to restrict store trading hours.

6.0 Noise from delivery activity

- 6.1 The closest properties to the proposed Aldi loading bay are at 14 Taf Olwg to the north and 25 Llanfabon Road to the west. The closest proposed future residential properties at Ty Du would be well over 200 metres to the east, with unloading activity at the Aldi loading bay screened by the store building.
- 6.2 The following typical delivery activity source noise (ambient) levels were measured at a large number of other Aldi stores:

TABLE 5: Delivery activity - baseline source noise levels (free field)

Measured delivery event source noise Level (at 10 metres)					
Arrival		Unloading		Departure	
Duration (mins)	L _{Aeq T} (dB)	Duration (mins)	L _{Aeq T} (dB)	Duration (mins)	L _{Aeq T} (dB)
1	69	45	58	0.5	67

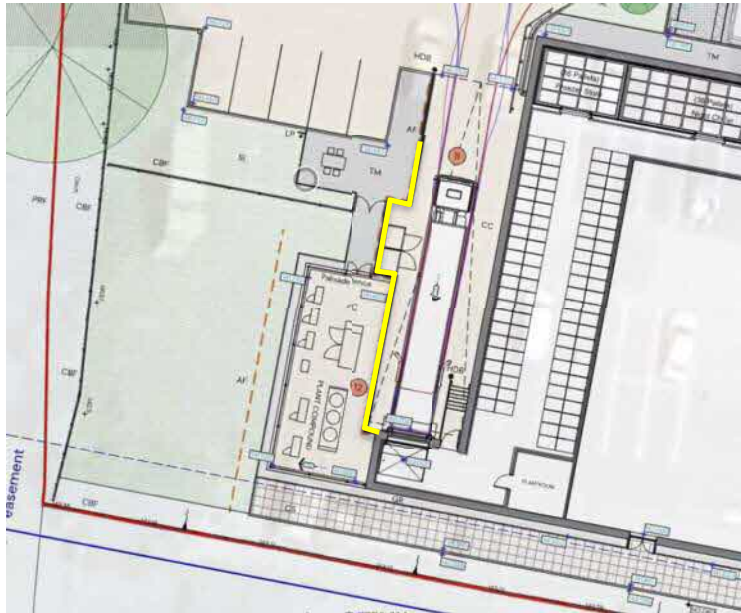
- 6.3 All these sound levels are representative at 10 metres and are measured with the microphone in free field, away from any reflecting surfaces. The levels stated are realistic worst-case noise levels from a large collection of sample measurements and include all typical delivery activity noise (including reversing alarms, roller shutters, movement of goods, refrigeration units).
- 6.4 Table 6 below shows the predicted ambient (L_{Aeq T}) delivery activity noise levels at the noise sensitive receptors (full delivery event activity noise predictions are included at Appendix C1).

TABLE 6: Predicted delivery activity noise levels

Receptor	Predicted noise level dB L _{Aeq 1 hour}
25 Llanfabon Road	29
14 Taf Olwg	39
Future resi at Ty Du	26

6.5 Note that the screening attenuation in the calculation for 25 Llanfabon Road (where a nominal reduction of 10 dB has been applied) is made on the basis of a solid 2 metres high noise barrier being located to the west of the loading bay, as indicated at Figure 4 below.

FIGURE 4: Location of proposed 2m high noise barrier adjacent to loading bay.



6.6 An assessment of delivery activity noise levels using the methodology in BS 4142:2014+A1:2019 is presented in Appendix C2. The table below summarises the comparison of the predicted delivery rating level and background noise climate.

TABLE 7: BS 4142:2014 assessment of delivery activity noise

Receptor	Excess of rating level over background noise level dB		Initial estimate from BS 4142 assessment*
	Daytime	Evening	
R1 - 25 Llanfanon Road	-12 dB	-3 dB	Low impact day and night
R2 - 14 Taf Olwg	-19 dB	+19 dB	Low impact day; significant adverse impact night
R3 - Future residential development at Ty Du	-32 dB	+6 dB	Low impact day, adverse impact night

*Depending upon context

6.7 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”.

6.8 On the basis of the initial estimate/numerical assessment, the BS 4142 assessment is indicative of a low impact classification for deliveries occurring during the daytime, and an adverse or significant adverse impact at night.

6.9 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).

6.10 A key contextual noise consideration is the comparison of the predicted delivery activity noise level with the WHO GCN values. The table below shows this comparison.

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

Noise level	Parameter					
	L _{Aeq} 1 hour	L _{Amax} ^[1]	L _{Aeq} 1 hour	L _{Amax} ^[1]	L _{Aeq} 1 hour	L _{Amax} ^[1]
Receptor	25 Llanfabon Road		14 Taf Olwg		Future resi at Ty Du	
Predicted delivery event noise level	29	50/45/50	39	57/59/57	26	48/42/48
WHO guideline noise value day/night ^[2]	55/45	60	55/45	60	55/45	60
Comply with WHO guidelines (daytime/night time)	YES/YES	YES/YES/YES	YES/YES	YES/YES/YES	YES/YES	YES/YES/YES

Notes

[1] Arrival/unloading/departure

[2] Where L_{AeqT} = 16 hour daytime, L_{AeqT} = 8 hour night time

- 6.11 The comparison in Table 8 indicates that delivery event noise levels are below the WHO GCN at all times. Hence noise associated with deliveries occurring at any time of the day or night would be indicative of low impact.
- 6.12 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

Receptor	Date	Time	Noise level $L_{Aeq,T}$				Noise impact	
			Existing noise climate	Predicted delivery activity noise	Overall existing + predicted	Change in level		
14 Taf Olwg	12.12.23	15:00	70.8	39.0	70.8	0.0	Low	
		16:00	70.8	39.0	70.8	0.0	Low	
		17:00	70.6	39.0	70.6	0.0	Low	
		18:00	69.5	39.0	69.5	0.0	Low	
		19:00	68.0	39.0	68.0	0.0	Low	
		20:00	66.8	39.0	66.8	0.0	Low	
		21:00	66.5	39.0	66.5	0.0	Low	
		22:00	65.6	39.0	65.6	0.0	Low	
	23:00	62.8	39.0	62.8	0.0	Low		
	13.12.23	00:00	61.0	39.0	61.0	0.0	Low	
		01:00	58.5	39.0	58.5	0.0	Low	
		02:00	57.5	39.0	57.6	0.1	Low	
		03:00	61.3	39.0	61.3	0.0	Low	
		04:00	66.8	39.0	66.8	0.0	Low	
		05:00	68.1	39.0	68.1	0.0	Low	
		06:00	70.6	39.0	70.6	0.0	Low	
		07:00	71.5	39.0	71.5	0.0	Low	
		08:00	71.0	39.0	71.0	0.0	Low	
		09:00	70.1	39.0	70.1	0.0	Low	
		10:00	66.1	39.0	66.1	0.0	Low	
		11:00	66.0	39.0	66.0	0.0	Low	
		12:00	66.9	39.0	66.9	0.0	Low	
		25 Llanfabon Road	12.12.23	22:00:00	56.7	29.0	56.7	0.0
13.12.23			02:00:00	47.3	29.0	47.4	0.1	Low

- 6.13 The impact classification in the context of change in external ambient noise level for delivery activity is indicative of low impact at all times. The above table is based on the SR noise survey, with ambient noise levels dictated by road traffic sources. If the same comparison were to be undertaken in relation to the ambient noise levels from the ACL noise survey then the identified impact would still be low.
- 6.14 Overall this assessment objectively demonstrates that when considered in context, against the relevant standards and guidance, deliveries could be made to the proposed Aldi store at any time of the day or night without associated noise giving rise to significant adverse impact; which is the planning test. The key indicator in relation to the acceptability of deliveries occurring within the night time periods is how predicted peak (L_{Amax}) noise levels compare to WHO guideline peak noise criterion, associated with the onset of sleep disturbance. Although the existing background noise climate at night may be low, so are absolute predicted delivery activity noise levels, such that the onset of sleep disturbance would be avoided.
- 6.15 This assessment objectively demonstrates that there is no requirement, on noise impact grounds, for the local authority to seek to restrict Aldi store delivery hours.

7.0 Assessment conclusions

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

Trading: Unrestricted

Deliveries: Unrestricted

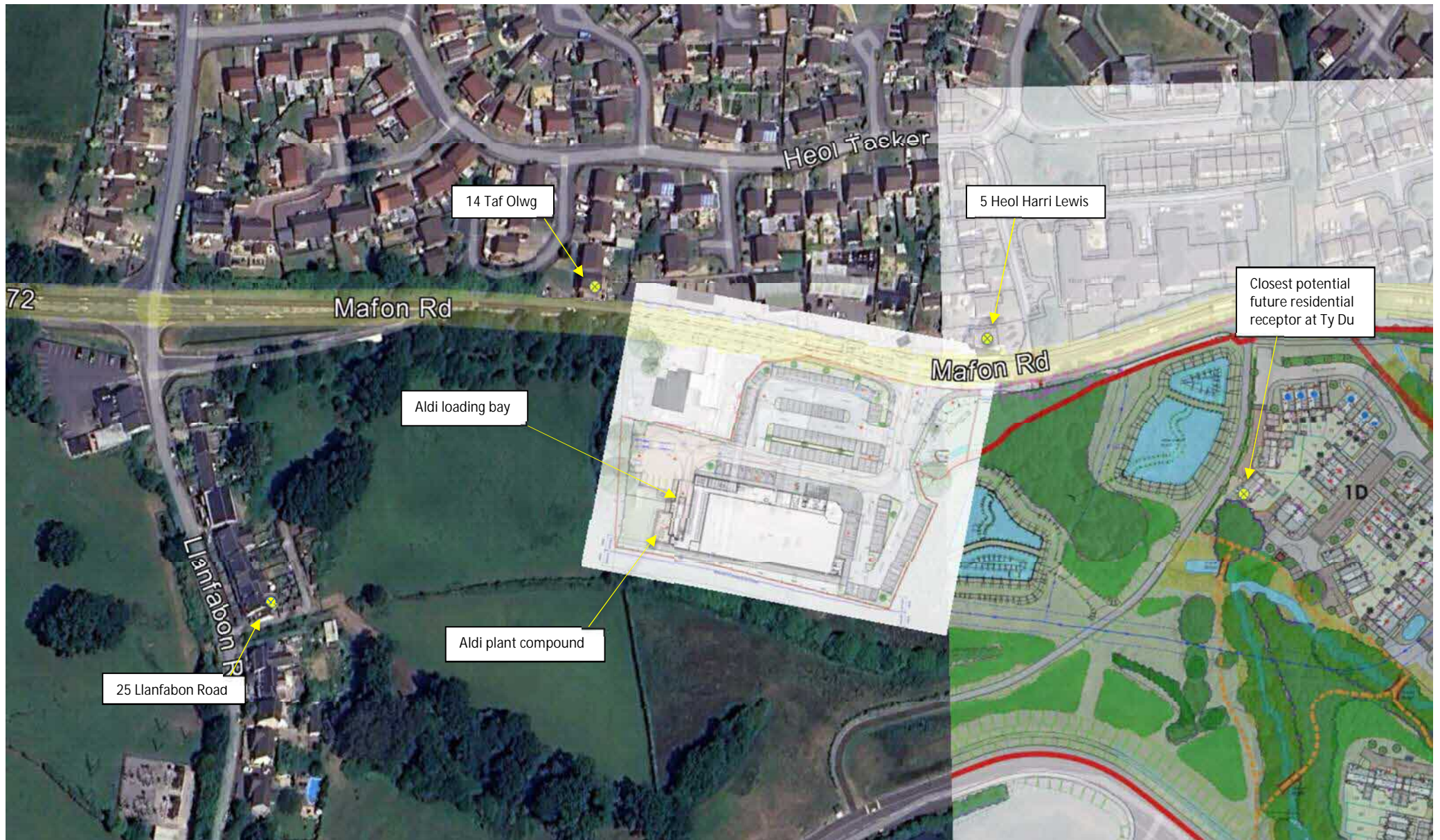
7.2 Fixed plant and equipment noise levels can be secured by the imposition of a suitably worded planning condition as presented at section 4 of this report.

7.3 In summary, based on a thorough assessment against objective standards, noise associated with the proposed Aldi development would comply with the objectives of PPW to “prevent adverse effects to amenity, health and the environment...”.

APPENDIX A

SITE PLAN

Appendix A: Site plan



APPENDIX B

NOISE SURVEY RESULTS

Measurement location A: Mafon Road, Nelson, Caerphilly

Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
12.12.23	15:30	73.4	66.4	71.0	80.1	60.0
	15:45	72.8	66.3	70.6	80.6	60.8
	16:00	73.1	66.9	71.0	79.7	59.5
	16:15	72.7	67.3	70.7	76.7	61.2
	16:30	72.7	66.5	70.4	77.3	61.0
	16:45	72.9	66.9	70.9	81.4	59.1
	17:00	73.1	66.6	71.1	78.7	59.2
	17:15	72.7	67.1	70.7	80.2	58.1
	17:30	72.4	67.0	70.4	79.3	62.7
	17:45	72.5	65.5	70.2	79.5	57.3
	18:00	72.2	64.5	69.8	82.1	55.8
	18:15	72.9	64.8	70.2	76.6	59.0
	18:30	71.8	64.0	69.3	74.3	54.4
	18:45	71.5	61.7	68.6	75.7	56.2
	19:00	71.7	60.9	68.5	79.4	54.1
	19:15	71.2	60.6	68.2	76.4	50.3
	19:30	71.2	59.1	68.0	83.1	53.4
	19:45	70.6	57.3	67.2	76.4	49.9
	20:00	70.3	56.7	66.7	75.9	49.3
	20:15	70.5	57.0	66.8	76.1	50.8
	20:30	70.9	55.5	66.9	77.1	48.7
	20:45	70.6	57.3	66.9	78.0	50.1
	21:00	70.4	53.3	66.5	77.3	48.2
	21:15	70.7	55.7	66.9	80.7	50.1
	21:30	70.0	54.3	66.6	85.6	48.3
	21:45	70.6	53.8	66.1	74.9	49.2
	22:00	70.0	53.0	65.8	80.7	48.0
	22:15	71.1	53.7	67.1	78.5	47.1
	22:30	68.7	49.4	64.4	76.2	46.1
	22:45	69.0	48.8	64.5	77.1	46.0
23:00	69.4	47.1	64.6	77.0	45.7	
23:15	67.4	47.1	62.9	80.2	45.4	
23:30	66.0	46.9	60.8	75.5	45.7	
23:45	66.5	46.8	62.1	76.2	45.6	
13.12.23	00:00	66.1	48.0	62.3	77.3	45.9
	00:15	66.1	46.9	61.6	76.0	45.8
	00:30	66.2	47.0	61.3	74.0	46.0
	00:45	59.2	46.6	57.5	76.0	45.6
	01:00	61.6	46.5	58.7	74.1	45.7
	01:15	58.6	46.3	56.7	72.8	44.7
	01:30	59.7	46.8	58.8	78.3	45.9
	01:45	62.6	46.8	59.4	75.8	45.6
	02:00	57.9	46.7	58.1	75.8	45.7
	02:15	52.2	46.7	54.0	73.4	45.8
	02:30	58.8	46.7	59.0	77.1	45.7
	02:45	57.5	46.3	57.3	74.7	45.2
	03:00	60.6	46.4	61.0	79.8	45.4
	03:15	65.6	46.6	62.9	80.0	45.3
	03:30	63.1	47.1	61.3	78.6	46.1

Measurement location A: Mafon Road, Nelson, Caerphilly

Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
13.12.23	03:45	60.1	46.8	59.0	74.4	45.7
	04:00	65.1	47.5	62.3	79.2	46.3
	04:15	70.5	48.7	66.1	82.3	46.0
	04:30	70.8	47.5	69.7	93.8	45.5
	04:45	70.6	49.0	66.2	80.8	46.5
	05:00	70.5	51.8	65.9	76.1	47.6
	05:15	71.7	56.0	68.1	80.7	48.1
	05:30	72.9	58.4	69.2	79.1	49.9
	05:45	72.6	53.5	68.4	81.2	48.7
	06:00	72.5	56.0	68.5	79.7	50.2
	06:15	73.8	60.6	70.5	80.7	51.3
	06:30	74.2	63.4	71.4	86.5	52.8
	06:45	74.2	64.4	71.4	79.4	53.9
	07:00	74.0	65.6	71.3	80.4	59.1
	07:15	73.6	64.9	71.3	78.6	54.9
	07:30	74.2	68.9	72.4	86.7	62.6
	07:45	73.0	67.1	71.0	80.1	59.6
	08:00	73.9	66.1	71.5	84.0	58.5
	08:15	73.1	64.2	70.5	77.6	57.3
	08:30	73.4	65.9	70.9	79.4	56.0
	08:45	73.2	66.1	71.0	86.2	58.9
	09:00	74.0	66.2	71.6	85.1	59.3
	09:15	72.5	62.0	69.7	81.6	53.4
	09:30	71.0	59.5	68.6	78.6	53.7
	10:00	68.4	57.4	65.7	80.1	53.3
	10:15	68.8	58.5	65.4	78.8	55.4
	10:30	68.3	58.5	65.1	77.3	53.2
	10:45	70.8	58.9	67.6	82.2	51.3
	11:00	68.7	57.6	65.1	79.5	53.0
	11:15	69.3	59.6	66.1	75.9	55.0
	11:30	69.1	57.8	65.8	83.3	55.0
	11:45	69.9	59.3	66.7	76.3	55.2
	12:00	70.3	58.7	66.9	76.8	52.3

Measurement location A: Mafon Road, Nelson, Caerphilly

Date	Sample start time	Noise Parameter - dB				
		L _{A10}	L _{A90}	L _{Aeq}	L _{AFmax}	L _{AFmin}
12.12.23	22:00	58.9	41.2	56.7	71.3	40.1
13.12.23	02:00	48.9	35.8	47.6	63.2	33.8
	02:15	48.7	36.0	47.3	60.2	33.6

APPENDIX C

PREDICTED DELIVERY EVENT NOISE LEVELS AND BS 4142 ASSESSMENT

APPENDIX C1.1

Assessment project: Aldi, Nelson, Caerphilly	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels ($L_{Aeq,T}$)			
Closest residential property address:	R1 - 25 Llanfebon Road		
Source noise level at 10 metres $L_{Aeq,T}$	69	58	67
Time - minutes	1	45	0.5
Distance between noise source and residential property in metres	180	166	180
Screening attenuation dB *	0	10	0
Convert to 1 hour - dB	-17.8	-1.2	-20.8
Convert to 15 mins - dB	-11.8	-0.3	-
Distance attenuation correction - dB	-25.1	-24.4	-25.1
Activity $L_{Aeq,1\text{ hr}}$	26.1 dB	22.3 dB	21.1 dB
Activity $L_{Aeq,15\text{ mins}}$	32.1 dB	23.3 dB	-
Rating level correction	0 dB	0 dB	0 dB
Resultant daytime rating level $L_{Ar,Tr}$	26.1 dB	22.3 dB	21.1 dB
Resultant nighttime rating level $L_{Ar,Tr}$	32.1 dB	23.3 dB	-
Overall delivery activity noise (arrival, unloading, departure) $L_{Aeq,1\text{ hr}}$		29 dB	
Overall delivery activity noise (arrival + unloading) $L_{Aeq,15\text{ mins}}$		33 dB	
Rating level dB $L_{Aeq,1\text{ hr}}$		29 dB	
Rating level dB $L_{Aeq,15\text{ mins}}$		33 dB	
Delivery noise activity - predicted peak noise levels (L_{Amax})			
Source noise level at 10 metres L_{Amax}	75	79	75
Distance between noise source and residential property in metres	180	166	180
Screening attenuation dB *	0	10	0
Distance attenuation correction - dB	-25.1	-24.4	-25.1
Peak noise level L_{Amax}	50 dB	45 dB	50 dB

APPENDIX C1.2

Assessment project: Aldi, Nelson, Caerphilly	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels ($L_{Aeq,T}$)			
Closest residential property address:	R2 - 14 Taf Olwg		
Source noise level at 10 metres $L_{Aeq,T}$	69	58	67
Time - minutes	1	45	0.5
Distance between noise source and residential property in metres	77	104	77
Screening attenuation dB *	0	0	0
Convert to 1 hour - dB	-17.8	-1.2	-20.8
Convert to 15 mins - dB	-11.8	-0.3	-
Distance attenuation correction - dB	-17.7	-20.3	-17.7
Activity $L_{Aeq,1\text{ hr}}$	33.5 dB	36.4 dB	28.5 dB
Activity $L_{Aeq,15\text{ mins}}$	39.5 dB	37.4 dB	-
Rating level correction	2 dB	3 dB	0 dB
Resultant daytime rating level $L_{Ar,Tr}$	35.5 dB	39.4 dB	28.5 dB
Resultant nighttime rating level $L_{Ar,Tr}$	41.5 dB	40.4 dB	-
Overall delivery activity noise (arrival, unloading, departure) $L_{Aeq,1\text{ hr}}$		39 dB	
Overall delivery activity noise (arrival + unloading) $L_{Aeq,15\text{ mins}}$		42 dB	
Rating level dB $L_{Aeq,1\text{ hr}}$		41 dB	
Rating level dB $L_{Aeq,15\text{ mins}}$		44 dB	
Delivery noise activity - predicted peak noise levels (L_{Amax})			
Source noise level at 10 metres L_{Amax}	75	79	75
Distance between noise source and residential property in metres	77	104	77
Screening attenuation dB *	0	0	0
Distance attenuation correction - dB	-17.7	-20.3	-17.7
Peak noise level L_{Amax}	57 dB	59 dB	57 dB

APPENDIX C1.3

Assessment project: Aldi, Nelson, Caerphilly	Delivery component		
	Arrival	Unloading	Departure
Delivery noise activity - predicted ambient noise levels ($L_{Aeq,T}$)			
Closest residential property address:	R3 - Potential future residential development Ty Du		
Source noise level at 10 metres $L_{Aeq,T}$	69	58	67
Time - minutes	1	45	0.5
Distance between noise source and residential property in metres	225	232	225
Screening attenuation dB *	0	10	0
Convert to 1 hour - dB	-17.8	-1.2	-20.8
Convert to 15 mins - dB	-11.8	-0.3	-
Distance attenuation correction - dB	-27.0	-27.3	-27.0
Activity $L_{Aeq,1hr}$	24.2 dB	19.4 dB	19.2 dB
Activity $L_{Aeq,15mins}$	30.2 dB	20.4 dB	-
Rating level correction	0 dB	0 dB	0 dB
Resultant daytime rating level $L_{Ar,Tr}$	24.2 dB	19.4 dB	19.2 dB
Resultant nighttime rating level $L_{Ar,Tr}$	30.2 dB	20.4 dB	-
Overall delivery activity noise (arrival, unloading, departure) $L_{Aeq,1hr}$		26 dB	
Overall delivery activity noise (arrival + unloading) $L_{Aeq,15mins}$		31 dB	
Rating level dB $L_{Aeq,1hr}$		26 dB	
Rating level dB $L_{Aeq,15mins}$		31 dB	
Delivery noise activity - predicted peak noise levels (L_{Amax})			
Source noise level at 10 metres L_{Amax}	75	79	75
Distance between noise source and residential property in metres	225	232	225
Screening attenuation dB *	0	10	0
Distance attenuation correction - dB	-27.0	-27.3	-27.0
Peak noise level L_{Amax}	48 dB	42 dB	48 dB

* Screening attenuation, unloading activity on nominal/conservative reduction of 10 dB (based on no line of sight from receptor to source) provided by the store building

Appendix C2: BS 4142:2014+A1:2019 assessment

APPENDIX C2.1

Results	Time period		Relevant clause	Commentary
	12.12.23 - 13.12.23			
	Daytime 0700-2300 hours	Night time 2300-0700 hours		
Receptor	R1 - 25 Llanfabon Road			
Background sound level dB (L _{A90})	41 dB	36 dB	8.1, 8.1.3	
Specific sound level - predicted delivery event noise level	29 dB	33 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)	no rating level correction has been applied within the delivery calculation		9.2	no rating level correction has been applied for perceptible bangs and crashes of unloading activity due to the distances involved, and screening alongside loading bay
Rating level	29 dB	33 dB	9.2	
Background sound level	41 dB	36 dB	8.1	
Excess of rating level over background level	-12	-3	11	
Assessment is indicative of low impact	Relevant clause 11 The context is: 1. Predicted noise levels comply with the daytime and night time WHO guideline noise values 2. Predicted noise levels are below the existing ambient noise climate			
Uncertainty of the assessment	Relevant clause 10			
	Only limited (end of daytime and middle of night time) noise measurements were obtained at this receptor - assessment therefore based on these measured background noise levels, rather than typical values			
	The excess of the rating level over the background sound level is between -12 dB and -3 dB. In this instance the uncertainty of the measurement may have some significance in the outcome of the assessment.			
The uncertainty relating to source noise levels is reduced due to the large database of measured Aldi delivery activity held by Sharps Redmore.				

APPENDIX C2.2

Results	Time period		Relevant clause	Commentary
	12.12.23 - 13.12.23			
	Daytime 0700-2300 hours	Night time 2300-0700 hours		
Receptor	R2 - 14 Taf Olwg			
Background sound level dB (L _{A90})	58 dB	25 dB	8.1, 8.1.3	
Specific sound level - predicted delivery event noise level	39 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 corrections has been applied within the delivery calculation		9.2	night time rating level correction applied for just perceptible bangs and crashes of unloading activity and just perceptible tonality from arrival manoeuvring. Daytime, no correction applied due to high background noise climate
Rating level	39 dB	44 dB	9.2	
Background sound level	58 dB	25 dB	8.1	
Excess of rating level over background level	-19	+19	11	
Assessment is indicative of between low and significant adverse impact	<p>Relevant clause 11</p> <p>The context is:</p> <ol style="list-style-type: none"> 1. Predicted noise levels comply with the daytime and night time WHO guideline noise values 2. Predicted noise levels are below the existing ambient noise climate 			
Uncertainty of the assessment	Relevant clause 10			
	The nighttime background noise level is estimated based on the direct measurements at Mafon Road of 46 dB. This measured level during the night time was influenced by the existing Co op plant. A review of the measured noise survey data from the Acoustic Consultants Ltd noise report, to accompany the proposed residential application to the east (ref 23/0508/FULL) indicated typical lowest background noise levels at night in the region of 25 dB LA90. This level has been used as the basis for the BS 4142 assessment of delivery activity at night.			
	The excess of the rating level over the background sound level is between -19 dB and +19 dB. In this instance the uncertainty of the measurement may have some significance in the outcome of the assessment.			
	The uncertainty relating to source noise levels is reduced due to the large database of measured Aldi delivery activity held by Sharps Redmore.			

APPENDIX C2.3

Results	Time period		Relevant clause	Commentary
	12.12.23 - 13.12.23			
	Daytime 0700-2300 hours	Night time 2300-0700 hours		
Receptor	R3 - Potential future residential development Ty Du			
Background sound level dB (L _{A90})	58 dB	25 dB	8.1, 8.1.3	
Specific sound level - predicted delivery event noise level	26 dB	31 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)	no rating level correction has been applied within the delivery calculation		9.2	no rating level correction has been applied for perceptible bangs and crashes of unloading activity due to the distances involved, and screening from store building
Rating level	26 dB	31 dB	9.2	
Background sound level	58 dB	25 dB	8.1	
Excess of rating level over background level	-32	+6	11	
Assessment is indicative of between low and adverse impact	<p>Relevant clause 11</p> <p>The context is:</p> <ol style="list-style-type: none"> 1. Predicted noise levels comply with the daytime and night time WHO guideline noise values 2. Predicted noise levels are below the existing ambient noise climate 			
Uncertainty of the assessment	Relevant clause 10			
	The nighttime background noise level is estimated based on the direct measurements at Mafon Road of 46 dB. This measured level during the night time was influenced by the existing Co op plant. A review of the measured noise survey data from the Acoustic Consultants Ltd noise report, to accompany the proposed residential application to the east (ref 23/0508/FULL) indicated typical lowest background noise levels at night in the region of 25 dB LA90. This level has been used as the basis for the BS 4142 assessment of delivery activity at night.			
	The excess of the rating level over the background sound level is between -32 dB and +6 dB. In this instance the uncertainty of the measurement may have some significance in the outcome of the assessment.			
	The uncertainty relating to source noise levels is reduced due to the large database of measured Aldi delivery activity held by Sharps Redmore.			

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:

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