Aldi store
Altrincham Road
Manchester
M23 9SR

Delivery Noise Impact Assessment

On behalf of

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1.0 Introduction

1.1. Noise Solutions Ltd (NSL) has been commissioned by Aldi Stores Limited to undertake a noise impact assessment in relation to an application to extend the permitted delivery hours at the Aldi store on Altrincham Road in Manchester.

1.2. An environmental noise survey was undertaken to establish prevailing noise levels affecting the residential premises closest to the store. As assessment has been made of the likely noise impact of deliveries to the store made during the proposed extended servicing hours, using recognised Standards and Guidance, with a comparison made of the expected noise impacts within the existing and proposed delivery periods.

1.3. To assist with the understanding of this report a glossary of acoustic terms can be found in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at http://www.acoustic-glossary.co.uk.

2.0 Site layout and context

2.1. The Aldi store is located on the north side of the A560 Altrincham Road in Baguley. The store's loading bay is located along the north side of the building.

2.2. Aldi delivery vehicles enter the site from Altrincham Road, drive through the car park and reverse down a ramp to the loading bay's roller shutter door, providing level access from the trailer bed. This negates the requirement for tail-lift operation and wheeling trolleys across rough external ground finishes which is a scenario that often occurs at other food stores. Trollies are only manoeuvred internally, either inside the trailer or within the store, on flat level surfaces.

2.3. Deliveries to the store are currently permitted only between 07.00 and 20.00 hours Monday to Saturday and between 08.00 and 18.00 hours on Sundays and Public and Bank Holidays. Aldi wish to extend those hours to permit deliveries up to 21.00 hours on Monday to Saturday.

2.4. An aerial view of the area and street-level view of the location of the loading bay are shown in **Appendix B**.

3.0 Nearest noise sensitive receptors

3.1. The area to the north and west of the store is residential.

3.2. The nearest noise-sensitive receptors are the houses on the south end of Gateacre Walk (Receptor R1), immediately to the north of the loading bay.

3.3. All other receptors are further from the receptors identified, with some also benefitting from acoustic screening provided by intervening buildings.

3.4. These receptors are indicated in **Appendix B**.

4.0 Policy context

National Planning Policy Framework

4.1. A new edition of NPPF was published in September 2023 and came into effect immediately. The original National Planning Policy Framework (NPPF[1]) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The 2023 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the September 2023 edition.

4.2. Paragraph 174 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability."*

4.3. The NPPF goes on to state in Paragraph 185:

"*planning policies and decisions should …*

a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and quality of life;
b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason …

4.4. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE[3]).

4.5. Paragraph 2 of the NPPF states that *"planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise."*

4.6. Paragraph 12 of the NPPF states that *"The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including*

[1] National Planning Policy Framework, DCLG, March 2012
[3] Noise Policy Statement for England, DEFRA, March 2010

any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed".

4.7. Paragraph 119 states that *"Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land".*

Noise Policy Statement for England

4.8. The Noise Policy Statement for England (NPSE[4]), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are: "*Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

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

4.9. The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and quality of life occur.

4.10. The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the NPSE). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case: *"…all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development."*

4.11. Importantly, the NPSE goes on to state that: "This does not mean that such adverse effects cannot occur."

[4] Noise Policy Statement for England, Defra, March 2010

4.12. The NPSE does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that: *"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*

4.13. It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

Planning Practice Guidance – Noise

4.14. An updated Planning Practice Guidance (PPG[5]) for noise was published on 22 July 2019 and provides additional guidance and elaboration on the NPPF. It advises that when plan-making and decision-taking, the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

4.15. This guidance introduced the concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). NOAEL differs from NOEL in that it represents a situation where the acoustic character of an area can be slightly affected (but not such that there is a perceived change in the quality of life). UAEL represents a situation where noise is 'very disruptive' and should be 'prevented' (as opposed to SOAEL, which represents a situation where noise is 'disruptive', and should be 'avoided').

4.16. As exposure increases above the LOAEL, the noise begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. As the noise exposure increases, it will then at some point cross the SOAEL boundary.

4.17. The LOAEL is described in PPG[6] as the level above which *"noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard"*.

[5] Planning Practice Guidance – Noise, https://www.gov.uk/guidance/noise--2, 22 July 2019
[6] Paragraph: 005 Reference ID: 30-005-20190722

4.18. PPG identifies the SOAEL as the level above which *"noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present."*

4.19. In line with the Explanatory Note of the NPSE, the PPG goes on to reference the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG[7] acknowledges that *"…the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those 5ffectted. This will depend on how various factors combine in any particular situation."*

4.20. The relevant guidance in the PPG in relation to the adverse effect levels is summarized below:

Table 1 Table of effects (Planning Policy Guidance)

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

[7] Paragraph: 006 Reference ID: 30-006-20190722

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

4.21. The Planning Practice Guidance[8] states the following in relation to mitigation measures:

> *"For noise sensitive developments, mitigation measures can include avoiding noisy locations in the first place; designing the development to reduce the impact of noise from adjoining activities or the local environment; incorporating noise barriers; and optimising the sound insulation provided by the building envelope."*

4.22. In addition, the Guide notes that it may also be relevant to consider[9]:

> *"... whether any adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time (and the effect this may have on living conditions). In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations".*

[8] Paragraph: 010 Reference ID: 30-010-20190722
[9] Paragraph: 006 Reference ID: 30-006-20190722

5.0 Acoustic standards and guidance

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings.

5.1. This Standard provides recommended guideline values for internal noise levels within dwellings which are similar in scope to guideline values contained within the World Health Organisation (WHO) document, Guidelines for Community Noise (1999[10]). These guideline noise levels are shown in Table 2, below:

Table 2 BS 8233 Desirable Internal Ambient Noise Levels for Dwellings

Activity	Location	07:00 to 23:00 hours	23:00 to 07:00 hours
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

5.2. BS 8233:2014 advises that: *"regular individual noise events…can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and number of events per night. Sporadic noise events could require separate values."*

5.3. The standard also provides advice in relation to design criteria for external noise. It states that:

> *"for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable.*
>
> *In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.*
>
> *Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available,*

[10] World Health Organisation Guidelines for Community Noise, 1999

i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate.

Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation.

In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

World Health Organisation, Guidelines for Community Noise, 1999 (WHO)

5.4. The World Health Organisation (WHO) Guidelines for Community Noise (1999) recommends suitable internal and external noise levels based on dose response research. The levels recommended in this guidance could be correlated to the LOAEL. Relevant guidance from this document is presented below.

- Sleep Disturbance (Night-time internal LOAEL): If negative effects on sleep are to be avoided, the equivalent sound pressure level should not exceed 30dBA indoors for continuous noise.

- Interference with Communication (Daytime internal LOAEL): Noise tends to interfere with auditory communication, in which speech is a most important signal. However, it is also vital to be able to hear alarming and informative signals such as door bells, telephone signals, alarm clocks, fire alarms etc., as well as sounds and signals involved in occupational tasks. The effects of noise on speech discrimination have been studied extensively and deal with this problem in lexical terms (mostly words but also sentences). For communication distances beyond a few metres, speech interference starts at sound pressure levels below 50 dB for octave bands centred on the main speech frequencies at 500, 1 000 and 2 000 Hz. It is usually possible to express the relationship between noise levels and speech intelligibility in a single diagram, based on the following assumptions and empirical observations, and for speaker-to-listener distance of about 1 metre:

  a) Speech in relaxed conversation is 100% intelligible in background noise levels of about 35dBA, and can be understood fairly well in background levels of 45dBA.

  b) Speech with more vocal effort can be understood when the background sound pressure level is about 65dBA.

World Health Organisation (WHO) 2009

5.5. The introduction of the Directive on Environmental Noise obliges Member States to assess and manage noise levels. With the support of the European Commission, the WHO Regional Office for Europe has developed night noise guidelines for Europe to help Member States develop legislation to control noise exposure.

5.6. The guidelines are based on scientific evidence on the effects of noise and the thresholds above which these effects appear to harm human health.

5.7. There is limited evidence that night noise is related to hypertension, heart attacks, depression, changes in hormone levels, fatigue and accidents.

5.8. The WHO report summarises the threshold levels of night noise above which a negative effect starts to occur or above which the impact becomes dependent on the level of exposure. For example, the threshold level for waking in the night and/or too early in the morning was 42 dB.

5.9. It also establishes that there are differences in the intensity and frequency of noise depending on the source, which lead to different impacts. Road traffic is characterised by low levels of noise per event, but as there are a high number of events, on average it has a greater effect on awakenings than air traffic, which has high levels of noise per event but fewer events.

5.10. Integrating these findings, the report proposed a guideline target limit of outdoor night noise of 40 dB (annual average defined as 'Lnight' in the Environmental Noise Directive). There is not sufficient evidence that the biological effects observed below this level are harmful to health but adverse effects are observed above 40dB.

BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound

5.11. BS 4142:2014+A1:2019[11] is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes *"sound from fixed plant installations which comprise mechanical and electrical plant and equipment"* and *"sound from the loading and unloading of goods and materials at industrial and/or commercial premises"*.

5.12. The procedure contained in BS 4142:2014 is to quantify the *"specific sound level"*, which is the measured or predicted level of sound from the source in question over a one-hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

[11] For the purposes of brevity, references in this report to "BS 4142:2014" or "BS 4142" should be read as BS 4142:2014 + A1:2019

5.13. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.

5.14. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."*

5.15. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: *"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."*

5.16. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

- *Typically, the greater this difference, the greater the magnitude of the impact.*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;*
- *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.*

5.17. The standard does state that "*adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."*

5.18. The standard goes on to note that: *"Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

5.19. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"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."

5.20. BS 4142:2014 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Manchester City Council

5.21. Planning permission for an extension to the store was granted by Manchester City Council in October 2015.

5.22. Condition 5 within the Decision Notice[12] states (*inter alia*):

> *No loading or unloading, within both the service yard and at the front entrance of the store, shall be carried out on the site outside the hours:*
>
> *Monday to Saturday 07:00 to 20:00*
> *Sunday 08:00 to 18:00*

6.0 Existing noise climate

Environmental sound levels

6.1. An environmental noise survey was undertaken to establish the typical background sound levels at locations representative of the noise climate at the residential and other noise-sensitive receptors around the site.

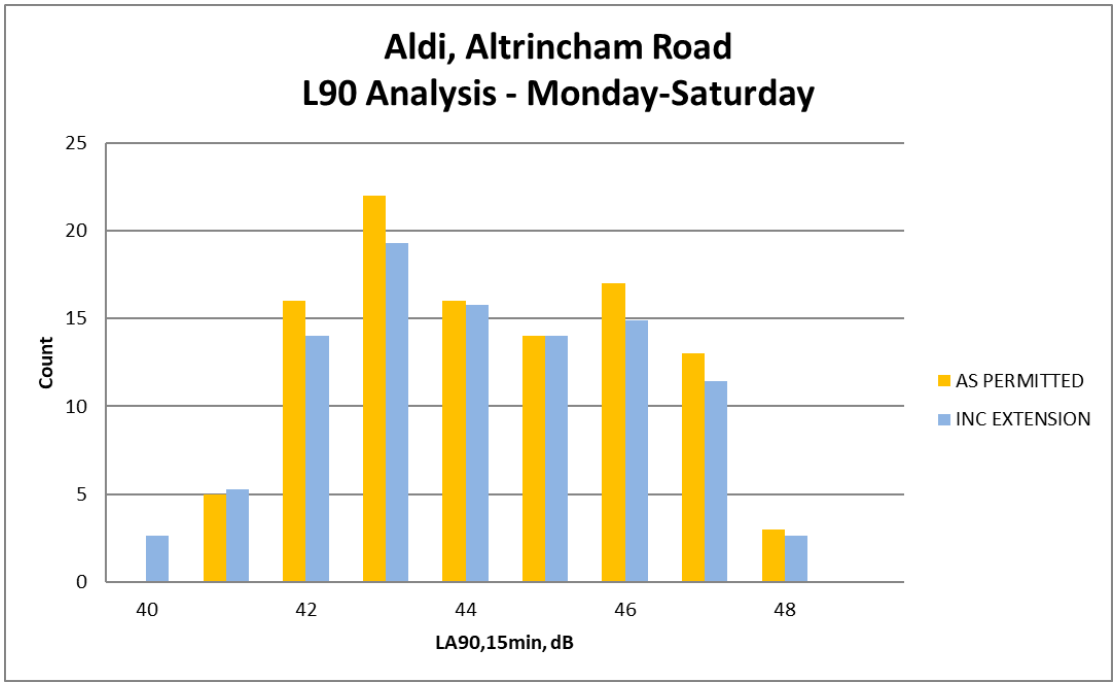
6.2. The results of the environmental sound survey are summarised in Table 3. The full set of measurement results and details of the survey methodology are presented in **Appendix D**.

[12] 110012/FO/2015/S2

Table 3 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	$L_{Aeq(15mins)}$	$L_{Amax(15mins)}$	$L_{A10(15mins)}$	$L_{A90(15mins)}$
Daytime (07.00 – 23.00 hours)	40-68	53-94	42-72	37-52
Night-time (23.00 – 07.00 hours)	37-57	44-75	39-61	34-47
Current permitted delivery hours, Monday to Saturday (07.00-20.00 hours)	46-65	62-91	48-68	41-48
Proposed delivery hours, Monday to Saturday (07.00-21.00 hours)	46-65	62-91	48-68	40-48
Proposed extended delivery period, 20.00 – 21.00 hours, Monday to Saturday	47-57	68-78	49-60	40-45

Figure 1 Histogram of L_{A90} background sound pressure levels during Monday to Saturday delivery periods (current permitted hours in orange)



6.3. Further statistical analysis has been carried out on the data, and the mean and median values are shown in Table 4 below.

Table 4 Statistical analysis of $L_{A90,15min}$ levels during the Monday to Saturday delivery periods

	dB, L_{A90}		
	Current permitted period, 07.00 – 20.00 hrs	**Proposed delivery period, 07.00 – 21.00 hrs**	**Proposed extension period, 20.00 – 21.00 hrs**
Mean	44	44	42
Mode	43	43	40
Median	44	44	42
Representative	42	42	40*

**lowest L_{A90} 15min in period*

6.4. It can be seen there is no significant difference in background sound levels when comparing the current permitted Monday to Saturday delivery periods with those proposed.

7.0 Assessment of delivery noise

Sound pressure levels of activities associated with store deliveries

7.1. The sound pressure levels associated with refrigerated lorry deliveries were established by measurement of a delivery at a similar Aldi store already in operation. The measurements included all aspects of the delivery including, but not limited to, the arrival, unloading, movement of cages and the departure of the lorry. The sound pressure levels were normalised to a distance of 10m from the delivery area and have been converted to Sound Exposure Levels (SEL) for ease of comparison/calculation. Typical L_{Amax} levels were also established.

7.2. Table 5 details typical source noise levels, used within the assessment, with the data presented in terms of SEL and maximum individual noise event levels (L_{AFmax}).

Table 5 Reference noise data for delivery activities (at 10m)

Noise Source	SEL, dB(A)	L_{Afmax}, dB(A)
Lorry arrival and pass-by on exit	69	61
Lorry reversing & manoeuvring into loading bay	65	58
Door open/close	60	68
Cage and pallet movement	51	59
Engine starts and lorry departs	74	71

Delivery noise impact assessment

7.3. The information contained in Table 5 was used to 'build-up' a source noise level based on the number of activity events over the required assessment period using the following equation:

7.4. $L_{Aeq,T} = SEL + 10.\log\left(\frac{1}{T}\right) + 10.log(N)$ (Equation 1)

Where:
SEL is the L_{Aeq} over a one second period, and represents the noise energy from an event (e.g. cage movement) compressed into one second;
T is the reference time period in seconds; and
N is the number of movements in the time period, T.

7.5. The distances to the receptor from the various activities, and the applicable BS 4142 feature corrections, are shown in Table 6.

Table 6 Distances and feature corrections

Activity	Minimum distance, m	BS4142:2014 feature correction, dB
	R1 – houses on Gateacre Walk	
Lorry Arrives and turns, all forwards	25	+3 (intermittency)
Lorry reverses and manoeuvres into loading bay	16	+3 (intermittency)
Door open close	16	+6 (impulsivity)
Cage/pallet movement	16	+6 (impulsivity)
Engine starts and lorry leaves	16	+3 (intermittency)

7.6. Table 7 presents the calculated cumulative L_{Aeq} and 'maximum' L_{Amax} noise levels at the receptor. Full calculations are included within **Appendix C**.

Table 7 Predicted delivery noise levels at residential façade

Receptor	Period	Predicted noise levels at window of most affected residential dwelling		
		$L_{Aeq,T}$, dB	$L_{Ar,Tr}$, dB	Range of L_{Afmax} (dB)
R1	Daytime, one hour including one delivery	35	39	53-66

BS 4142:2014 delivery noise assessment

7.7. Table 8, and present the assessment of the likely noise impact of deliveries at the nearest houses, during the proposed extended Monday to Saturday delivery period (20.00 to 21.00 hours) in accordance with the BS 4142:2014 methodology.

Table 8 R1 Assessment of predicted external delivery noise levels using BS 4142:2014, 20.00-21.00 hours Monday to Saturday

Results		Relevant Clauses of BS4142:2014	Commentary
Background Sound level	L_{A90} = 40dB	8.1, 8.2	Lowest background sound level within the proposed extended delivery period
Assessment made during the daytime, so the reference interval is one hour		7.2	
Specific Sound Level	$L_{Aeq,T}$ = 35dB	7.3.6	Calculations presented in Appendix C
Rating Level	$L_{Ar,1\ hour}$ =39dB	9.2	Refer to Appendix C
Excess of Rating Level over background sound level	(39 - 40) dB = -1dB		
Assessment of impact: Negligible impact		11	

Context and uncertainties

7.8. As the standard advises, the estimated impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:

- The assessments are undertaken at a single residential window. The impact on all other residential windows will be lower due to distance losses and noise screening provided by the building structure.
- The number of expected deliveries by large articulated lorries is low (typically four per 24 hour period), and no more than one in the proposed extended period between 20.00 and 21.00 hours.

7.9. Where possible uncertainty in this assessment has been minimised by taking the following steps:

- The measurement of the background sound levels was undertaken over a period including the quietest times of the day and night.
- The sound level meter and calibrator used have a traceable laboratory calibration and were field calibrated before and after the measurements.
- Uncertainty in the calculated impact has been reduced by the use of a well-established calculation method.

- Care was taken to ensure that the measurement position was representative of the noise climate outside the nearby residential dwellings and not at a position where higher noise levels are present.

BS 8233:2014 and WHO delivery noise assessment

7.10. A BS 4142:2014 assessment considers only external noise levels at the location of sensitive receptors and does not consider the attenuation offered by the building envelope.

L_{Amax} assessment

7.11. The highest predicted L_{Amax} levels resulting from delivery activities at the worst-affected residential windows are 66dB. This is similar to the existing maximum sound levels in the proposed extended delivery period. Therefore, the anticipated L_{Amax} levels resulting from a delivery during that time period would be of negligible significance. It is to be noted, however, that the WHO guidance refers to sleep disturbance and the proposed extended delivery hours do not extend into the night-time period.

Summary of assessments

7.12. Predicted rating levels during the proposed delivery periods are no higher than the existing representative background sound level.

7.13. As noted in Paragraphs 6.4 there is no significant difference in representative background sound levels in the existing permitted delivery periods compared with those proposed. There is therefore considered to be no significant increase in noise impact as a result of the proposed extended delivery period.

8.0 Conclusions

8.1. Noise Solutions Limited has been commissioned by Aldi Stores Limited to provide a noise impact assessment to support an application for the extension of permitted delivery hours at the Aldi store on Altrincham Road in Manchester.

8.2. In support of these assessment works, a baseline noise survey was undertaken to determine the prevailing environmental noise levels at the nearest noise sensitive receptors to the store during representative periods. Reference noise measurements of delivery activity at a similar operating Aldi store were used in the assessment.

8.3. The results of the survey were used to undertake an assessment of the likely noise impact from deliveries at the store. For the purposes of the assessment, the methodology used in BS 4142:2014 was utilised. Further assessments were undertaken taking into consideration

guidance from the World Health Organisation and BS 8233:2014.

8.4. The results of the assessments were analysed and reviewed in line with the aims and advice contained within the National Policy Statement for England, the National Planning Policy Framework and the Planning Practice Guidance.

8.5. Predicted rating levels during the proposed delivery periods are below the existing representative background sound level, indicating that no worse than a negligible noise impact is anticipated. Furthermore, there is no significant difference in representative background sound levels in the existing permitted delivery periods compared with those proposed.

8.6. It is therefore considered that noise should not be considered as an obstacle to deliveries within the proposed extended period, 20.00 to 21.00 hours, Monday to Saturday.

Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 $\log_{10}$ (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20μPa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A –weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B Aerial photograph of site and plan showing delivery route

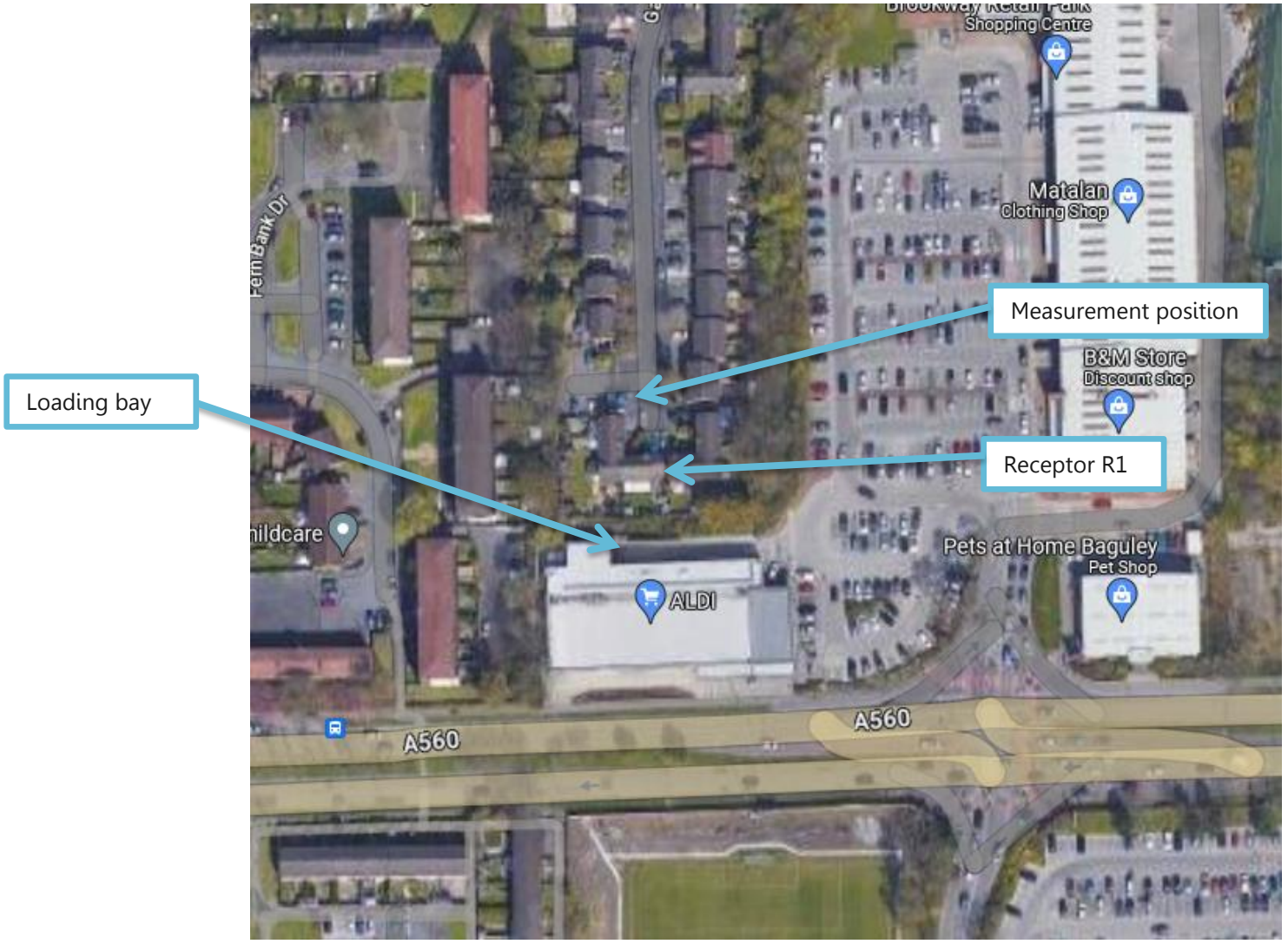
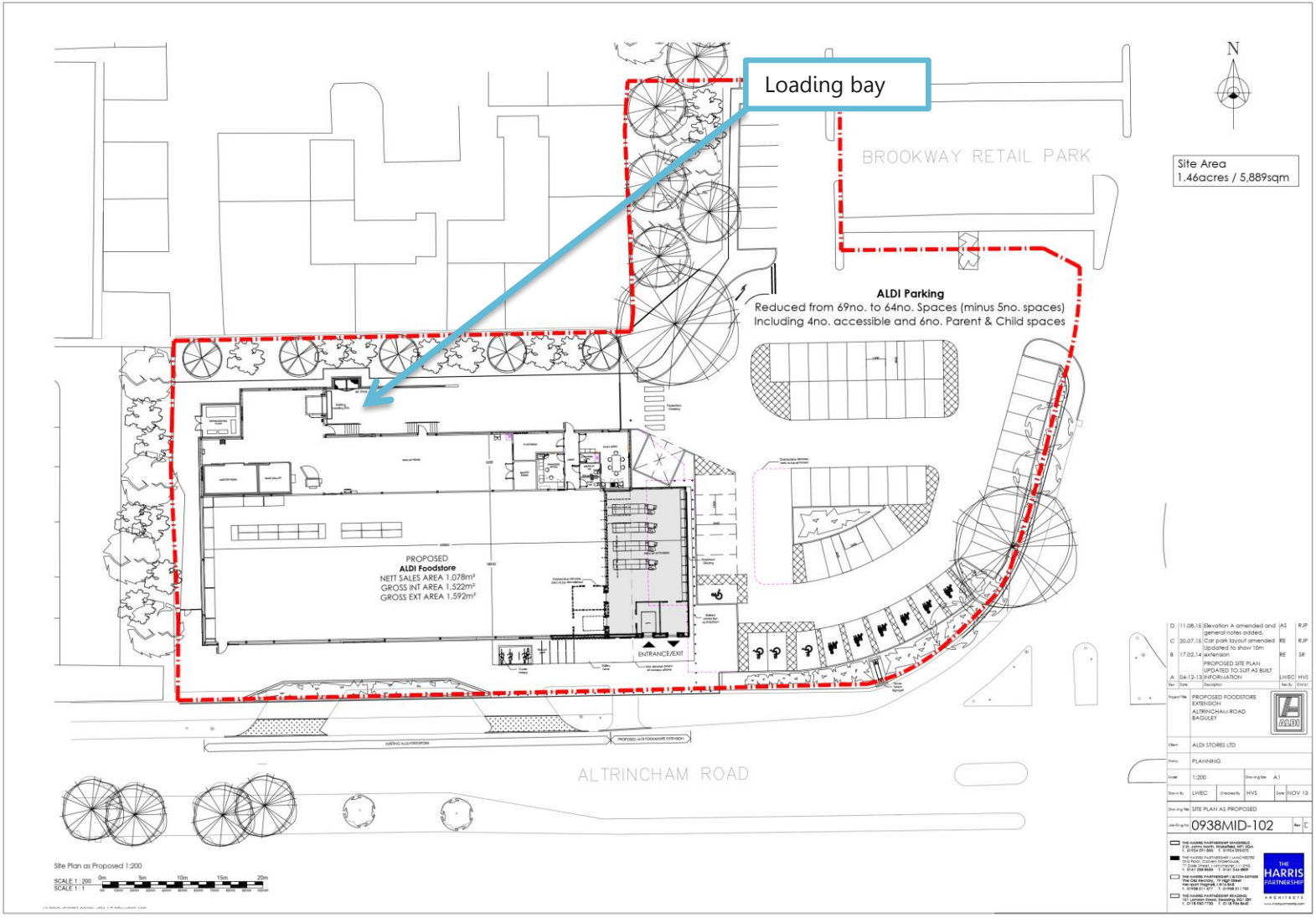


Image © Google 2023

Store plan


Loading bay
N
BROOKWAY RETAIL PARK
Site Area
1.46acres / 5,889sqm
ALDI Parking
Reduced from 69no. to 64no. Spaces (minus 5no. spaces)
Including 4no. accessible and 6no. Parent & Child spaces
PROPOSED
ALDI Foodstore
NETT SALES AREA 1,078m²
GROSS INT AREA 1,522m²
GROSS EXT AREA 1,592m²
ENTRANCE/EXIT
ALTRINCHAM ROAD
Site Plan as Proposed 1:200
SCALE 1 : 200
SCALE 1 : 1
PROPOSED SITE PLAN UPDATED TO SUIT AS BUILT
PROPOSED FOODSTORE EXTENSION
ALTRINCHAM ROAD
BAGULEY
ALDI STORES LTD
PLANNING
1:200
SITE PLAN AS PROPOSED
0938MID-102
THE HARRIS PARTNERSHIP

Appendix C Delivery noise impact calculations

R1 - daytime

Activity	Measured noise levels		Correction for no. of occurrences		Distance correction		Screening correction (dB)	Resultant SEL at receptor (dB)	BS4142 Feature (dB)	SEL + Feature (dB)	Resultant L_{Amax} at receptor (dB)
	SEL @ 10m	L_{Amax} @10m	No. of occurrences	Correction (dB)	Distance (m)	Correction (dB)					
Lorry Arrives and turns all forwards	69	61	1	0	25	-8	0	61	3	64	53
Lorry reverses and manoeuvres into loading bay	65	58	1	0	16	-4	0	61	3	64	54
Door open close	60	68	2	3	16	-4	0	59	6	65	63
Cage/pallet movement	51	59	10	10	16	-4	0	57	6	63	54
Engine starts and lorry leaves	74	71	1	0	16	-4	0	69	3	72	66
						Cumulative SEL		**71**		**74**	
						$L_{Aeq,1hr}$		**35**	$L_{Ar,1hour}$	**39**	
						Range of L_{Amax}					**53 - 66**

Appendix D Environmental sound survey

Details of environmental sound survey

D.1 Measurements of the existing environmental sound levels were undertaken between 11.14 hours on Friday 12th May and 11.14 hours on Monday 15th May 2023.

D.2 The sound level meter was programmed to record the A-weighted L_{eq}, L_{90}, L_{10} and L_{max} noise indices for consecutive 15-minute sample periods for the duration of the noise survey.

Measurement position

D.3 Measurements were made with the meter secured to a lamp-post on Gateacre Walk, close to the houses nearest to the site, as indicated on the aerial view in **Appendix B**. In accordance with BS 7445-2:1991 *'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*, the measurements were undertaken under free-field conditions.

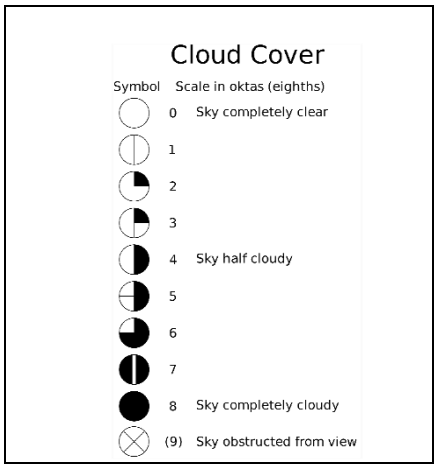
Equipment

D.4 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Rion NL-52 / 00654035	30/08/2022	TCRT22/1544
Condenser microphone	Rion UC-59 / 14826		
Preamplifier	Rion NH-25 / 87474		
Calibrator	Rion NC-74 /34235932	04/10/2022	1503480-1

Weather conditions

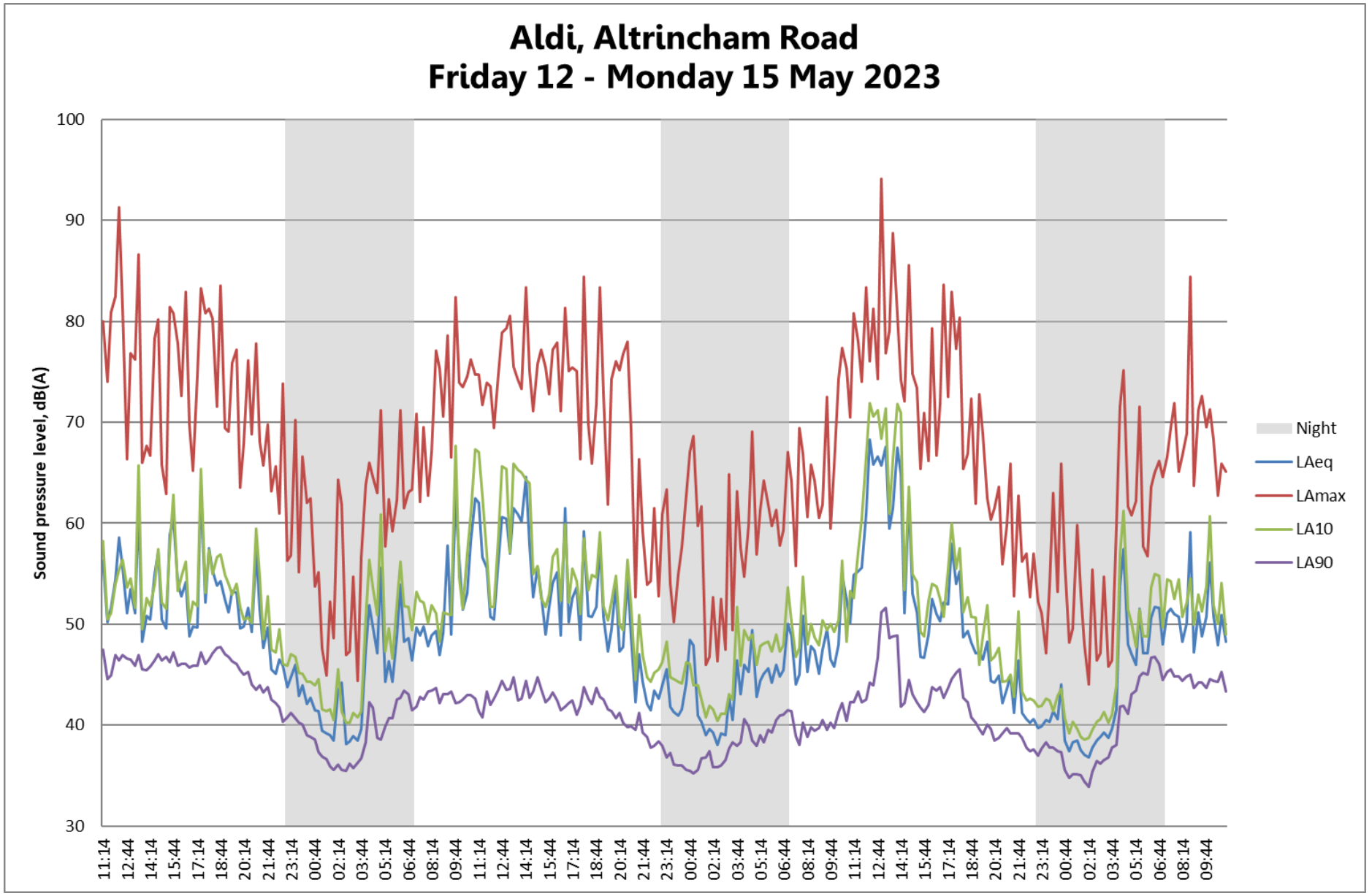
D.5 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	**Date/Time**	**Description**	**Beginning of Survey**	**End of Survey**
As indicated on Appendix B	11.14 12 May - 11.14 15 May 2023	Temperature (°C)	13	14
		Precipitation:	Intermittent	No
		Cloud cover (oktas - see guide)	7	5
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	Water in potholes	No
		Wind Speed (m/s)	1-2	1-2, gusting 3+
		Wind Direction	NW	N
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

D.6 The results of the environmental survey are considered to be representative of the background sound pressure levels at the façades of the nearest noise sensitive receptors. During the installation and removal of the meter noise levels were predominantly due to distant road traffic, with aircraft and passers-by occasionally audible.

D.7 The results of the survey are presented in a time history graph overleaf.


Aldi, Altrincham Road
Friday 12 - Monday 15 May 2023
Sound pressure level, dB(A)
100
90
80
70
60
50
40
30
11:14
12:44
14:14
15:44
17:14
18:44
20:14
21:44
23:14
00:44
02:14
03:44
05:14
06:44
08:14
09:44
11:14
12:44
14:14
15:44
17:14
18:44
20:14
21:44
23:14
00:44
02:14
03:44
05:14
06:44
08:14
09:44
11:14
12:44
14:14
15:44
17:14
18:44
20:14
21:44
23:14
00:44
02:14
03:44
05:14
06:44
08:14
09:44
Night
LAeq
LAmax
LA10
LA90