

Aldi Food Store
143 Lloyd St S, Fallowfield, Manchester, M14 7LA

Proposed Extension to Delivery Hours
Planning Noise Impact Assessment

Report ref.

RK3874/24304/Rev 1

Issued to

Aldi Stores Limited

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1. INTRODUCTION

Aldi Stores Ltd are seeking planning permission to extend their existing delivery hours restrictions at their supermarket site off Lloyd Street South in Fallowfield, Manchester. The site is located in a sensitive area. Consequently, a noise assessment is required to cover the impact of noise during the sensitive proposed delivery extension hours.

Accordingly, Spectrum Acoustic Consultants has been commissioned by Aldi Stores to carry out a noise assessment to establish the potential noise impact associated with extending the delivery hours. This report is submitted for the purpose of providing sufficient information to allow the Local Planning Authority to determine the application.

2. SITE DESCRIPTION AND PROPOSALS

Aldi currently operate a food store off 143 Lloyd Street South in Fallowfield, Manchester, M14 7LA. Lloyd Street South bounds the site to the west and has a number of commercial and residential properties located along it. Hart Road bounds the site to the east which has a number of commercial properties located along it. Above the commercial properties at first floor level are some dwellings. Platt Lane bounds the site to the south which also has a number of commercial properties located along it. Again, above some of the commercial properties at first floor level are dwellings. A site location plan is included in Appendix A.

The Aldi store has a car park to accommodate a number of vehicles, 5 of which are for disabled users. A loading bay is located on the east side of the store in a service area to accommodate deliveries. Delivery vehicles enter the site via Lloyd Street South and reverse and lock into a dock sleeve within the loading bay. Stock is then directly unloaded into the store's warehouse with no external unloading. The vehicle then quickly departs via the same route of entry.

Deliveries to the store are currently permitted as follows.

Monday to Saturday - 07:00 to 20:00.

Sundays and Bank Holidays - 08:00 to 18:00.

The intention is to extend the currently permitted delivery hours to the following.

Monday to Saturday - 06:00 to 23:00.

Sunday (including bank holidays) - 07:00 to 22:00.

Mechanical plant serving the store is located behind the service area at the south east corner of the store. The mechanical plant runs 24 hours per day. An existing site location plan is included in Appendix A.

3. NOISE CRITERIA

The noise impact assessment relating to deliveries at the store will be carried out in accordance with BS 4142:2014 *Methods for rating and assessing industrial and commercial sound*. The principle of BS 4142 is to determine an initial estimate of impact of industrial/commercial sound on nearby residents by comparing the Rating Level (sound level from the industrial/commercial source, with a correction applied for any acoustic features that characterise the sound) with the Background Sound Level (L_{A90} as measured in absence of the industrial/commercial source).



Generally, the greater the difference by which the Rating Level exceeds the Background Sound Level, the greater the magnitude of impact. BS 4142 states that *'a difference of around +10 dB or more is likely to be an indication of a significant adverse impact [...]. A difference of around +5 dB is likely to be an indication of an 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.'*

However, BS 4142 also advises that *'when making assessments and arriving at decisions [...] it is essential to place the sound in context'* so in each case, the context in which the sound is placed must be considered and the initial estimate of impact should be modified accordingly. For example it advises *'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.'* It also indicates that impacts estimated during *'the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes.'*

Additionally, Guidelines for Community Noise - World Health Organization, 1999 (GCN) was published in 1999 with the aim of informing legislation and guidance produced at the national and regional levels for the purposes of minimising any potential adverse health effects resulting from noise in the community. It presents guideline noise level criteria for the avoidance of adverse effects such as sleep disturbance and annoyance in a range of specific environments. The preface to WHO states that community noise includes road, rail and air traffic, industries, construction and public work, and the neighbourhood.

The GCN document advises in Table 4.1 a guideline façade level of $L_{Aeq,8\text{ hour}} 45\text{dB}$ outside of bedrooms during the night time to avoid sleep disturbance. During the daytime and evening, Table 4.1 recommends a guideline noise level of $L_{Aeq,16\text{ hour}} 55\text{dB}$ for outdoor living areas to avoid serious annoyance. Whilst noise levels outside of living rooms during the daytime are not listed in Table 4.1, a guideline internal level of $L_{Aeq,16\text{ hour}} 35\text{dB}$ for habitable rooms is provided to avoid moderate annoyance. Given that a difference of 15dB(A) between noise levels outside and inside of bedrooms during the night time is stated, a guideline noise level of $L_{Aeq,16\text{ hour}} 50\text{dB}$ outside of living rooms may be assumed.

New guidance from WHO titled Environmental Noise Guidelines for the European Region (ENG) was published in 2018. The document takes a very different approach to guidance set out in the previous GCN document by identifying separate thresholds for specific sources rather than for community noise as a whole. Consequently, much of the earlier guidance set out in GCN is now absent from ENG. While ENG was intended to supersede GCN, it recognises this absence and states that *'indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid.'*

It is recommended that all WHO guidance should be noted, but it should not be relied upon in assessments without reference to other relevant detailed guidance, especially that in British Standards. These may align better with Planning Practice Guidance¹ in England.

Therefore, for the assessment of the potential noise impact, as a result of noise from deliveries at the Aldi food store during the proposed extension hours, consideration will be given to the BS 4142:2014 assessment level, together with the precautionary guideline noise limits defined by the WHO GCN.

¹ PPG - Noise, MHCLG, 6 March 2014



4. BACKGROUND NOISE MEASUREMENT SURVEY

4.1 MEASUREMENT LOCATION

For the purpose of the noise assessment, the following noise measurement location has been identified as being representative of the most sensitive residential position to the delivery bay at the Aldi store:

- Position A – Eastern boundary of site, representative of the nearest dwellings on Hart Road.

The measurement location is illustrated on the existing site location plan, included in Appendix A.

4.2 NOISE SURVEY DETAILS AND INSTRUMENTATION

The background noise measurement survey, completed for providing information to use in the noise impact assessment, was carried out from Thursday 10 to Monday 14 October 2024. The noise survey consisted of continuous unattended measurements carried out throughout the entire monitoring period. All noise measurements were carried out in accordance with the procedures outlined in BS 4142:2014, with noise samples recorded in terms of 15-minute periods, at 2.5m above ground.

The parameters recorded during the measurement survey included L_{Aeq} , L_{A90} and L_{AFmax} . In accordance with BS 4142 guidance, L_{A90} is used for describing background noise and, as such, will be used for the purpose of the noise impact assessment. L_{Aeq} is used to describe the ambient noise level, with L_{Amax} representing the maximum noise level measured during the sample period.

The following instrumentation was used during the noise measurement survey:

- Bruel & Kjaer Type 2238 Sound Level Meter s/n 2562694
- Bruel & Kjaer Type 4188 Microphone s/n 2951073
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 2594792

Before and after the survey, the sound level meter was field-calibrated in accordance with the manufacturer's guidelines, and no significant drift was observed. The meter, microphone and field calibrator are laboratory calibrated biennially in accordance with UKAS procedures or to traceable National Standards.

During the noise survey, the weather was mild and dry, with low wind speeds. The conditions were suitable for noise measurement purposes.

4.3 NOISE SURVEY RESULTS

During the daytime, ambient noise levels in the environment around the site are controlled by road traffic movements on Lloyd Street South and other nearby roads, as well as mechanical services plant at the nearby commercial properties. During the night-time road traffic movements reduce, until the early morning hours from around 07:00 to coincide with increased rush-hour flows.

The measured noise profile at the noise monitoring location is shown in the following chart.

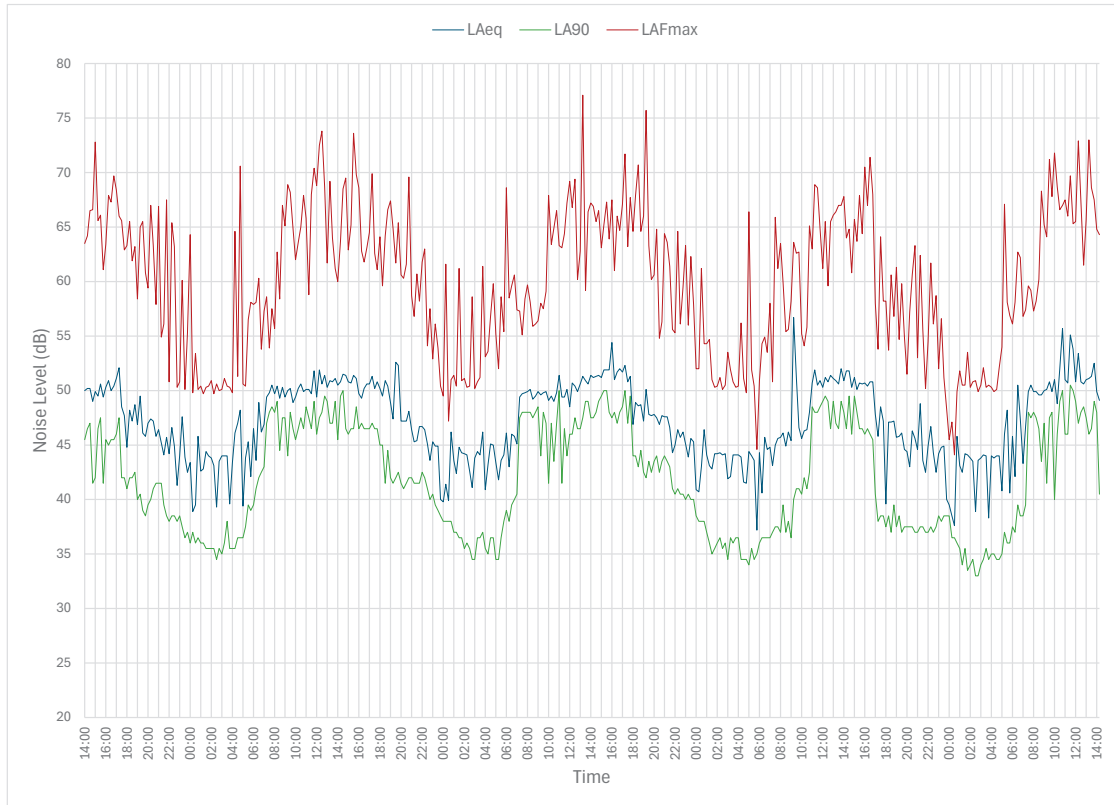


Chart 1: Position A (eastern boundary of site, representative of the nearest dwellings on Hart Road) ambient noise profile – Thursday 10 to Monday 14 October 2024.

When determining the representative background $LA_{90,T}$ levels for the relevant periods, BS 4142² guidance states “a representative level ought to account for the range in background levels and ought not automatically to be assumed to be either the minimum or modal value.” With this in mind, statistical analysis has been used to determine the representative background $LA_{90,T}$ noise levels for each of the sensitive periods. The analysis derived the Mode, Mean and Mean -1 standard deviation values. Once these three values have been established, a judgement is made as to which value is considered representative. In this instance the mean values $LA_{90,T}$ values were used for each of the periods at the measurement positions, as they were considered to be the most representative.

Table 1 shows the representative background noise levels during the sensitive proposed delivery extension periods at the noise measurement location from Thursday 10 to Monday 14 October 2024.

² BS 4142:2014 Methods for rating and assessing industrial and commercial sound



Day	Time	Representative Background $L_{A90,T}$ Noise Level (dB)
Thursday - 10.10.2024	22:00 – 23:00	39
Friday - 11.10.2024	06:00 – 07:00	42
	22:00 – 23:00	42
Saturday - 12.10.2024	06:00 – 07:00	39
	22:00 – 23:00	41
Sunday - 13.10.2024	07:00 – 08:00	38
	21:00 – 22:00	38
Monday - 14.10.2024	06:00 – 07:00	39

Table 1: Summary of the measured background noise levels during sensitive periods

During the most sensitive Monday to Sunday extension periods when deliveries are proposed at the Aldi store, the representative background noise level is $L_{A90,T}$ 38dB. Consequently, this will be used in the assessment.

5. ASSESSMENT OF NOISE IMPACT

5.1 PROJECTED NOISE FROM A DELIVERY

For the purpose of this assessment, the specific L_{Aeq} noise levels produced by a delivery at the Aldi food store at the noted residential receptor locations will be established by prediction.

The delivery process is broadly similar at all Aldi stores. Consequently, as the basis of the prediction, the typical noise levels produced during this activity have been referenced from detailed noise measurements covering deliveries made to the Aldi store in Sandbach, Cheshire.

For these measurements, continuous 2-second noise measurements were carried out at a height of 1.5m above ground, approximately 10m from the acoustic centre of the noise source (in this case the delivery operation).

Deliveries to Aldi stores typically last between fifty minutes, and an hour and twenty minutes. However, this period can be variable depending on the amount of stock being accepted by the store, with some delivery cycles taking just thirty to forty minutes. The procedure for a delivery is for the delivery vehicle to reverse and lock into a dock sleeve within the loading bay, so that stock is directly unloaded into the store warehouse with no external unloading.

Observations made during the measurement survey indicated that noise from the delivery vehicle (a HGV) is evident when the vehicle arrives, manoeuvres into position (with reverse alarm on) on the loading bay and then departs. However, the engine of the vehicle is then turned off once it has docked onto the loading bay, so for the greater part of the delivery, HGV engine noise is not evident.

With respect to noise from unloading of the vehicle, noise produced in the delivery bay area primarily consists of noise breaking out of the side of the trailer from pallets of stock being moved using a pallet truck, operating within the trailer and the dock sleeve. It is worth noting that the trailer of the vehicle under test was a temperature-controlled unit, with noise emanating from a dedicated, diesel-powered refrigeration motor. This presents a typical worst case delivery scenario, with regards to noise.

The noise profile taken over the delivery period (of approximately 40 minutes) is shown in Figure 1 below.

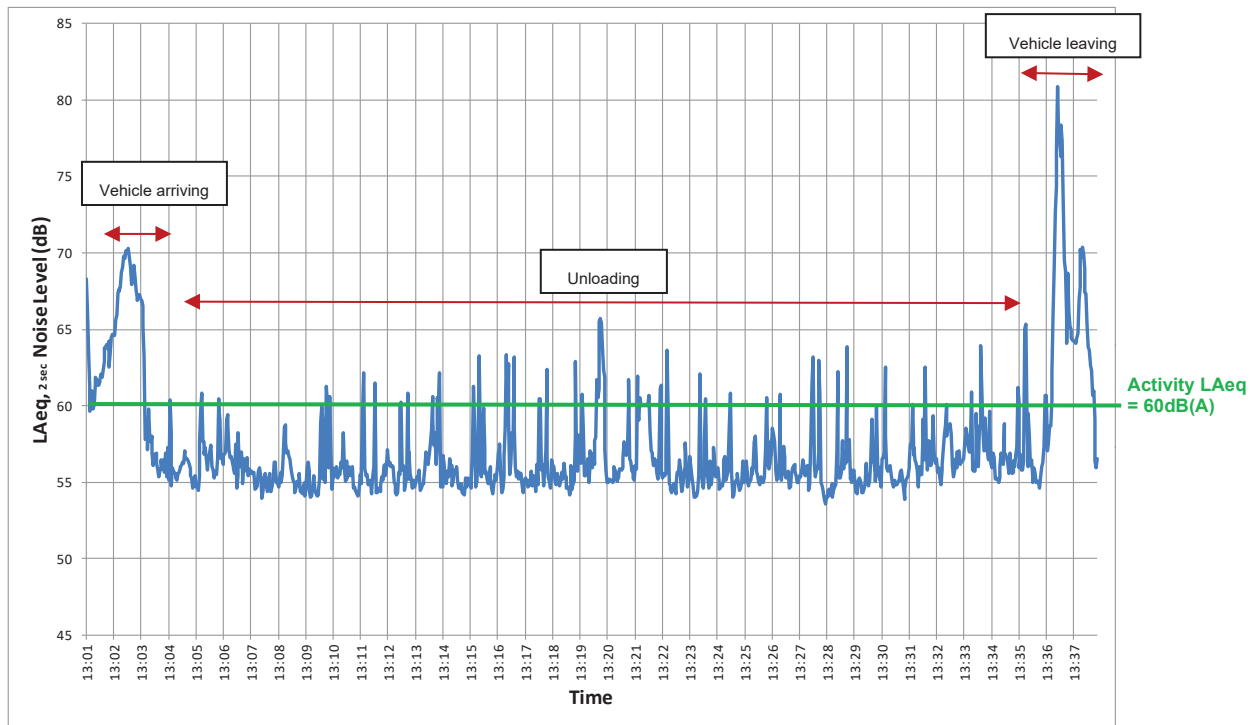


Figure 1: Measured noise levels from delivery activity at approximately 10m from the centre of the delivery area

Prediction methodologies use the sound power level (L_w) of a source as input data, so for this purpose the measured delivery activity noise level, expressed in terms of $L_{Aeq,T}$, needs to be converted to the equivalent activity sound power level. This is derived using the measured delivery $L_{Aeq,T}$ (where T is the delivery period), corrected firstly for the pre-existing ambient noise levels in the absence of the delivery and then to take account of the measurement surface area enveloping the noise source. A summary of the calculated activity sound power level associated with the delivery operation is shown in Table 2 below.

Detail	dB(A)	Octave Band Sound Power Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Activity $L_{Aeq,T}$ at 10m	60	66	65	55	53	55	54	45	38
L_p to L_w Correction	25	25	25	25	25	25	25	25	25
Activity Sound Power Level L_w	85	91	90	80	78	80	79	70	63

Table 2: Calculated activity sound power level associated with delivery operation

To accurately evaluate the overall effect of delivery noise, it is necessary to consider the noise that is likely to be generated by this operation, at the nearby residential receptor locations.

The sound power level of the delivery activity (as detailed in Table 2) is used as a starting point for the purpose of predicting noise levels in the surrounding environment and at specified community receptor locations near to the site, using an environmental noise propagation model.

This has been determined using proprietary software (iNoise³) which meets the requirements of ISO 9613 Part 2:1996⁴. The noise model takes account of the following in its calculations procedures:

- Source sound power level (for point, line and area sources)
- Reflection from nearby structures and source directivity
- Distance from noise source (geometric spreading)
- Atmospheric absorption
- Acoustic screening of intervening structures and topography
- Ground absorption
- Ground effects (which includes the height of ground relative to the noise source)

Initial predictions concluded that unmitigated noise levels associated with a delivery would be significant at the nearby residential receptor locations during the proposed extension periods. Consequently, mitigation options were discussed with Aldi in order to reduce the noise impact. Accordingly, the developer is proposing to construct a 4m high acoustic barrier fence along the side of the delivery bay. The barrier would have a weatherproof absorbent inner lining to reduce reflections between the HGV trailer and barrier. The barrier would also be tall enough to screen the entire side of the trailer. The barrier location is shown on a 3D view of the site in Appendix B.

The noise map, showing the noise contours produced by the delivery (with mitigation in place) is included in Appendix B of this report. Predicted specific noise levels at the nearby receptor locations are provided in Table 3 below. Note, as the proposed delivery extension hours would occur during the very early morning period, the specific noise levels have been calculated outside of the first-floor habitable rooms, as residents are likely to still be sleeping during this period.

Receptor	L_{Aeq} dB(A)	L_{Aeq} Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
R1. No.4A Hart Road	38	22	32	28	30	33	31	18	5
R2. No.4 Hart Road	37	22	31	27	29	32	29	17	2
R3. No.6 Hart Road	35	20	30	25	27	30	27	15	0

Table 3: Predicted specific noise contribution from the delivery activity at the nearest residential receptor location.

As indicated in Table 3 predicted noise levels at the community location would be L_{Aeq} 35-38dB(A).

5.2 DELIVERY NOISE IMPACT ASSESSMENT

Table 4 shows a BS 4142 assessment covering the delivery noise impact during the most sensitive proposed extension hours when the activity would have the highest impact.

In this case the rating level includes a +3dB(A) feature correction, as the delivery noise contains some occasional bangs and clatters, which may be considered as having impulsive character which would be just perceptible at the nearby residential receptor location. No on-time correction has been applied, as the duration of the loading activity is typically greater than the assessment period.

³ DGMR Raadgevende Ingenieurs B.V – iNoise V2024.1

⁴ ISO 9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation to determine Noise Levels

Whilst it is accepted that reversing alarms contain a tonal characteristic, this should be considered in the context of the overall impact of noise. The period when a reversing alarm would need to be sounded would typically last for no longer than 20 seconds whilst the vehicle manoeuvres into place on the loading bay. This accounts for a very small percentage of the overall time taken up by the delivery process. If this characteristic were to be assessed on its own in accordance with BS 4142:2014, a significant time correction would need to be applied. Furthermore, Section 9.2 of BS 4142:2014 states:

'NOTE 2 Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction.'

When considering the short period that a reversing alarm would sound, it would be inappropriate to apply a second correction for tonality, especially when a correction of 3dB has already been applied to account for impulsivity of the occasional bangs and clatters. When taking into account the length of the periods when the reverse alarm and unloading process are present, the impulsivity correction is evidently the dominant factor.

Residential Position	Specific Level (dB)	Character Correction (dB)	Rating Level (dB)	Background L_{A90} (dB)	Assessment Level (dB) (Background excess)
R1. No.4A Hart Road	38	+3	41	38	+3
R2. No.4 Hart Road	37	+3	40	38	+2
R3. No.6 Hart Road	35	+3	38	38	0

Table 4: Predicted rating level of delivery activity at the nearest residential property, compared with the most sensitive period background $L_{A90,T}$ level

The initial estimate predicts that at the nearest residential properties, delivery rating levels would exceed the representative background noise level by up to 3dB during the most sensitive extension hours. In line with BS 4142:2014, the assessment indicates that the impact would be between low and adverse.

The difference between the rating levels and background level indicates that uncertainty may have some significance on the outcome of the assessment. However, in an attempt to minimise the uncertainty, continuous noise measurements have been carried out throughout the most sensitive periods at the site and the predictions of noise have been carried out in accordance with ISO 9613 Part 2:1996⁵.

Specific noise levels from the delivery process would be comfortably lower than the WHO advised criteria at the nearby residential receptor locations.

Contextually, deliveries have been taking place at the store which is located in an area with other retail stores for many years. Therefore, the sensitivity of the residents would be reduced, as they have likely acclimatised to the character of the delivery activity over a long period. Consequently, in view of the above, extending the delivery window at the store would have a low noise impact at all of the nearby sensitive receptors.

⁵ ISO 9613-2:1996 "Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation to determine Noise Levels"



6. CONCLUSIONS

A noise assessment has been completed to consider the potential impacts of noise associated with a proposal to extend delivery hours at an existing Aldi food store off Lloyd Street South in Fallowfield, Manchester.

Noise limits for deliveries have been established during the proposed extension hours, based on measured background noise levels, taking account of BS 4142:2014 *Methods for rating and assessing industrial and commercial sound*.

The results of the noise assessment indicate that the noise impact associated with extending the store's delivery hours to 06:00 - 23:00, Monday to Saturday and 07:00 - 22:00, Sundays (including bank holidays) would be low with the mitigation measures in place.

APPENDIX A

Site Location Plan



Cozy Accommodation

Hart Rd

Horton Rd

The Parish of Saint Crispin Fallowfield

Hart Rd

Post Office

ALDI

Position A

Fallowfield Fish & Chips

Hoseki

Dallas Pizza

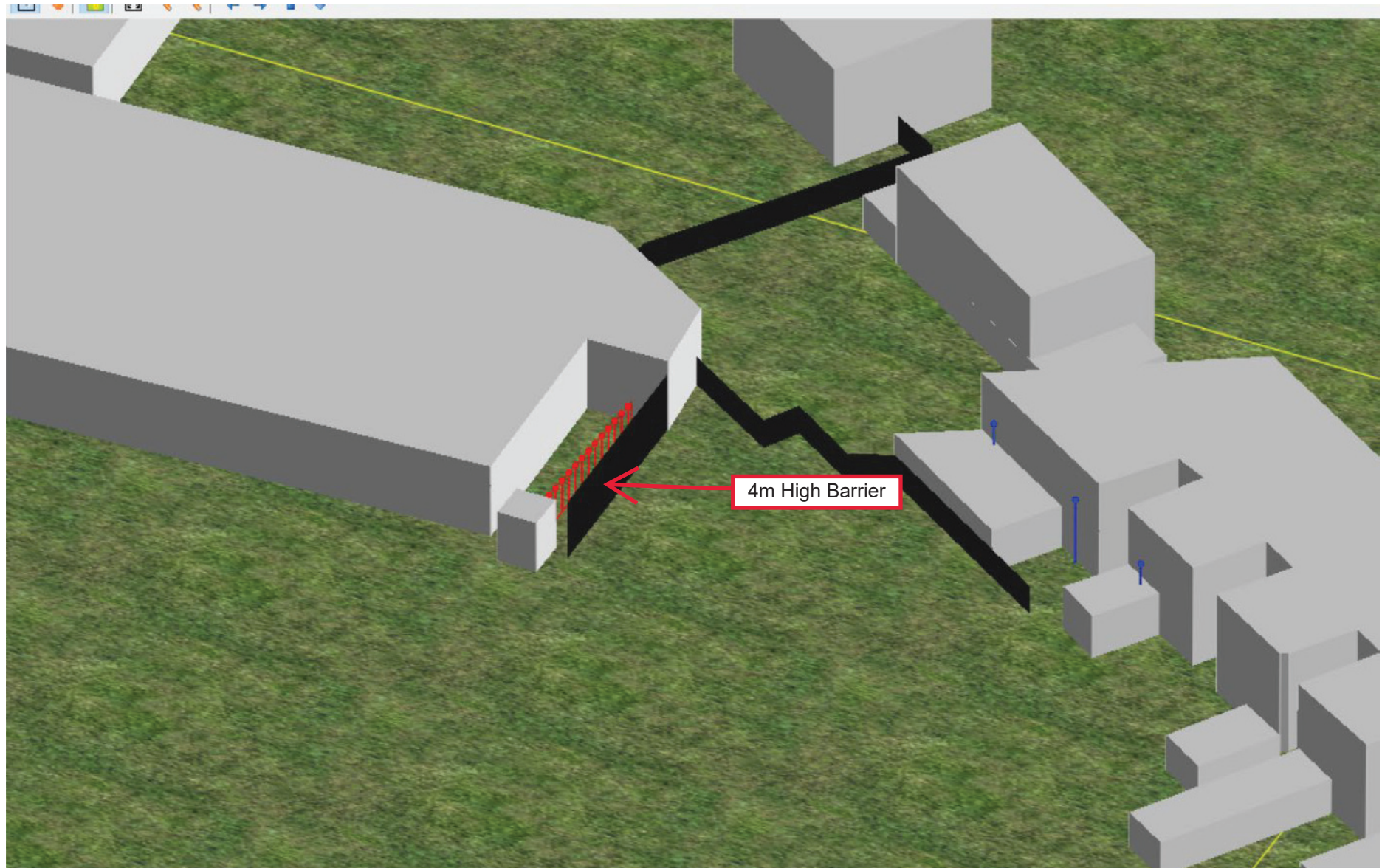
Ariyadh Arabic Restaurant

N

Lloyd Sts

APPENDIX B

Delivery Noise Prediction Model

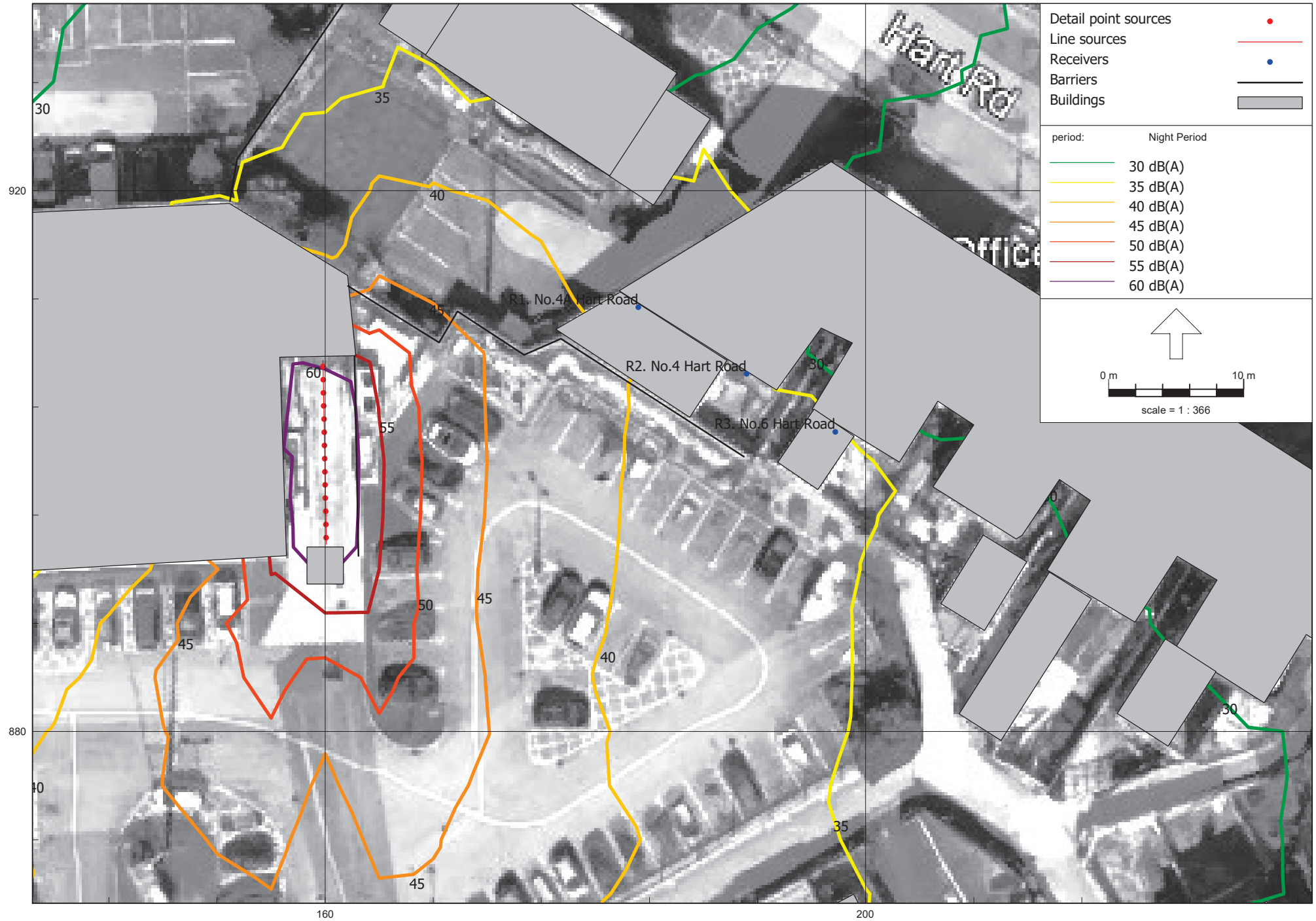


Aldi Fallowfield
Predicted Delivery Noise Levels

Report: Table of Results
Model: Delivery Noise Level - Rev 1
LAeq per octave: total results for receivers
Group: (main group)
Group Reduction: No

Name		Height	Night									
Receiver	Description		Total	31	63	125	250	500	1000	2000	4000	8000
_A	R1. No.4A Hart Road	4.50	38	--	22	32	28	30	33	31	18	5
_A	R2. No.4 Hart Road	4.50	37	--	22	31	27	29	32	29	17	2
_A	R3. No.6 Hart Road	4.50	35	--	20	30	25	27	30	27	15	0

All shown dB values are A-weighted



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