

ALDI STORES LTD  
PROPOSED ALDI STORE  
STATION ROAD, HEBBURN  
NOISE IMPACT ASSESSMENT

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## **SECTION 1 INTRODUCTION**

- 1.1 Environmental Noise Solutions Limited (ENS) has been commissioned by Aldi Stores Ltd (ASL) to undertake a noise impact assessment for a proposed store on land at Station Road, Hebburn.
- 1.2 The proposed development consists of: a single storey Aldi store incorporating a circa 1125 m<sup>2</sup> sales area along with a warehouse / storage area and amenity area for staff welfare facilities etc. in addition to an external loading area and refrigeration plant compound.
- 1.3 The proposed opening times of the store are understood to be: 08:00 to 22:00 hours Monday to Saturday and for 6 consecutive hours between 10:00 to 18:00 hours Sunday.
- 1.4 The proposed servicing (delivery) arrangements of the store are understood to be: 3 no. goods deliveries by a Class 1 HGV (with refrigeration box trailer) per day from the Aldi distribution depot and 1 no. goods deliveries per day by a Class 1 HGV (with refrigeration box trailer) per day from local milk suppliers. With respect to servicing hours, to aid operational flexibility, 24/7 servicing (delivery) hours are required.
- 1.5 The objectives of the noise impact assessment were to:
  - i.* Determine the ambient and background noise climate at the application site during representative periods of the daytime and night time to provide a baseline against which to assess predicted noise emissions;
  - ii.* Assess the potential impact of noise emissions associated with the proposed store (determined by reference to empirical data and/or calculation methods where appropriate) with reference to pertinent guidelines; and
  - iii.* Provide recommendations for any appropriate noise mitigation measures and/or management controls to minimise the potential noise impact of the proposed store (and its servicing requirements).
- 1.6 This assessment has been prepared to accompany a full planning application to be submitted to the local planning authority for a proposed Aldi store on land at Station Road, Hebburn.
- 1.7 This assessment has been prepared for ASL for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult ENS, ASL and/or Projekt Architects as to the extent to which the findings may be appropriate for their use.
- 1.8 A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.



## **SECTION 2 PROPOSED STORE DEVELOPMENT AND SITE SETTING**

### **2.1 PROPOSED STORE DEVELOPMENT**

2.1.1 An annotated site location plan and proposed site layout (Projekt Architects Drawing Number 0268-SK49) are reproduced in Appendix 2 for reference. The proposed site plan illustrates that the proposed development consists of a single storey Aldi store incorporating:

- i.* A large sales area along with a warehouse / storage area and amenity area for staff welfare facilities etc;
- ii.* An external loading bay and refrigeration plant compound; and
- iii.* 70 no. customer car parking bays.

2.1.2 The proposed opening times of the store are understood to be: 08:00 to 22:00 hours Monday to Saturday and for 6 consecutive hours between 10:00 to 18:00 hours Sunday.

2.1.3 The proposed servicing (delivery) arrangements of the store are understood to be: 3 no. goods deliveries by a Class 1 HGV (with refrigeration box trailer) per day from the Aldi distribution depot and 1 no. goods deliveries per day by a Class 1 HGV (with refrigeration box trailer) per day from local milk suppliers. With respect to servicing hours, to aid operational flexibility, 24/7 servicing (delivery) hours are required.

### **2.2 APPLICATION SITE SETTING**

2.2.1 The application site is located in a mixed use setting in Hebburn town centre; which is currently undergoing redevelopment with a number of residential blocks on and adjacent to the application site having been demolished. Roughly rectangular in shape, the application site is bound by:

- i.* Glen Street to the north west, with Victoria Medical Centre and 'The Glen' Primary Care Centre on the opposite side of the road.
- ii.* Station Road to the north east.
- iii.* A car park and commercial/municipal buildings (post office, supermarket and library) to the south east.
- iv.* A proposed access road to the south west, with a proposed car park and community hub (constructed) beyond the access road.

2.2.2 The nearest noise sensitive receptors to the application site are considered to be residential dwellings located approximately 85 metres beyond the south western



boundary of the application site (on the far side of Glen Street), the primary care uses on the far side of Glen Street and the proposed community hub.

**2.3 AMBIENT NOISE CLIMATE**

2.3.1 The ambient noise climate at the application site and its surrounding environs is characterised by road traffic and pedestrian noise.

**SECTION 3 BASELINE NOISE SURVEY**

3.1 In order to establish the baseline ambient and background noise levels (as denoted by the  $L_{Aeq,T}$  and  $L_{A90,T}$  parameters, respectively), a baseline noise survey was undertaken at the application site on Wednesday 10<sup>th</sup> to Thursday 11<sup>th</sup> June 2015 to provide a baseline against which to assess predicted noise emissions associated with the proposed store.

3.2 For the purpose of this assessment, a single monitoring position (MP1) was adopted, on the application site, at approximately 6 metres to the kerb of Glen Street (taken as representative of the distance of the primary care uses to the road).

3.3 The approximate location of the noise monitoring position is reproduced in Appendix 2 for reference. All noise measurements were taken in a free field environment at approximately 1.5 metres above ground level. All noise measurements were undertaken using a Bruel & Kjaer 2250 sound level meter with a 90 mm windshield fitted. All noise measurements consisted of A-weighted broadband parameters, together with linear third octave band levels. The following table contains a summary of the representative measurement data, rounded to the nearest decibel.

**Table 3.1 – Summary of Noise Measurement Data, MP1, 10-11 June 2015**

Time	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A1,T}$ (dB)	$L_{AFMax}$ (dB)	Comment
10:00-11:00	59	45	64	70	76	Local and distant road traffic
13:00-13:30	59	45	64	69	78	
18:20-19:20	59	45	63	68	80	
00:50-01:20	48	36	44	62	74	
<p><b>Daytime &amp; Evening ambient and background noise levels 59 dB <math>L_{Aeq,T}</math> &amp; 45 dB <math>L_{A90,T}</math>, respectively.</b></p> <p><b>Night time ambient and background noise levels 48 dB <math>L_{Aeq,T}</math> &amp; 36 dB <math>L_{A90,T}</math>, respectively</b></p>						

3.4 In assessing the potential noise impact of the proposed Aldi store on the amenity of the nearest noise sensitive receptors, it is relevant to note that the application site is located in an urban area adjacent to a moderately busy road network.



- 3.5 Ambient and background noise levels showed a clear diurnal pattern, ranging from 59 dB  $L_{Aeq,T}$  and 45 dB  $L_{A90,T}$ , respectively, during the daytime and evening period and 48 dB  $L_{Aeq,T}$  and 36 dB  $L_{A90,T}$ , respectively, during the night time period. The ambient and background noise levels are considered commensurate with the application site setting.

## **SECTION 4 NOISE IMPACT ASSESSMENT**

### **4.1 INTRODUCTION**

- 4.1.1 The principal noise sources potentially associated with the proposed Aldi store are considered to be:

- i.* Noise associated with any fixed external refrigeration plant.
- ii.* Noise associated with servicing arrangements (deliveries).
- iii.* Noise associated with the customer car park.

- 4.1.2 The following sections of the noise impact assessment discuss the potential noise impacts of the above activities on the amenity of the nearest noise sensitive receptors. It should be noted that the nearest noise sensitive receptors to the application site are non-residential and that the opening time of the primary care uses is up to 20:00 hours at the latest (the opening times of the proposed community hub are not known, but are assumed to be similar to the primary care uses).

### **4.2 FIXED EXTERNAL REFRIGERATION PLANT**

- 4.2.1 British Standard 4142:2014 'Methods for Rating and Assessing Industrial and Commercial Sound' (BS 4142) describes methods for determining, at the outside of a building, noise levels from factories or industrial/commercial premises and a method for assessing whether the noise is likely to give rise to complaints from people residing in the building.

- 4.2.2 BS 4142:2014 states:

*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*

*Typically, the greater this difference, the greater the magnitude of the impact. For example:*

*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.*

*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.*

*Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low. **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.***

- 4.2.3 It should be noted that the World Health Organisation's Night Noise Guidelines for Europe state that an external noise level of 40 dB  $L_{Aeq} (2300-0700)$  represents the Lowest Observed Adverse Effect Level (LOAEL).
- 4.2.4 Based upon the principles of BS 4142:2014, in order to protect local amenity, the noise level (including any acoustic character penalty) of fixed external plant should not exceed 45 dB  $L_{Aeq,T}$  during the daytime/evening (residential and non-residential noise sensitive receptors) and 36 dB  $L_{Aeq,T}$  during the night time (residential noise sensitive receptors) at the nearest noise sensitive receptors.
- 4.2.5 The plant compound is to be externally located adjacent to the south eastern elevation of the proposed store, in a location adjacent to the town centre car park and fully screened from the residential receptors off Glen Street.
- 4.2.6 The standard Aldi refrigeration plant module has a quoted sound pressure level of 45 dB(A) at 10 metres from source. On this basis, the standard refrigeration plant module is considered appropriate.



**4.3 PROPOSED SERVICING ARRANGEMENTS (DELIVERIES)**

4.3.1 The proposed servicing arrangements of the store are understood to be:

- i.* 3 no. goods deliveries per day by a Class 1 HGV (with refrigeration box trailer) per day;
- ii.* 1 no. goods deliveries per day by a Class 1 HGV (with refrigeration box trailer) per day from local milk suppliers.

4.3.2 The proposed service area for the Aldi store is adjacent to the south western side of the building. Vehicular access to the service area is via the customer car park.

4.3.3 Aldi operates a closely managed servicing arrangement for each of its stores. The Aldi articulated service vehicles are able to carry frozen, chilled and mixed goods assembled at a centralised distribution depot enabling the potential to reduce journeys.

4.3.4 During unloading, the back of the vehicle is at internal floor level, enabling the driver to unload the goods quickly into the dedicated storage area. The delivery has previously been pre-packed onto pallets.

4.3.5 Stores are constructed with a delivery ramp, sheltered canopy and dock leveller system which means products can be unloaded without any external activity, such as forklift trucks, scissor lifts or cages, and in less than half the time. The delivery system is unique to Aldi and extremely efficient compared to other food retailers.

4.3.6 The service area loading bay is located circa. 90 metres from the residential dwellings, 56 metres from the medical centre and 38 metres from the community hub and is partially screened from the medical centre and community hub. On this basis, the residential dwellings are considered the most sensitive receptor to delivery noise.

4.3.7 Measurements have previously been undertaken at a similar Aldi store, with an ambient noise level of 58 dB  $L_{Aeq,T}$  measured at a distance of 10 metres to the loading bay, with a direct line of sight to the operations during an HGV delivery. Assuming point source propagation of 6 decibel reduction per doubling of distance, results in an equivalent noise level of 39 dB  $L_{Aeq,T}$  at 90 metres (i.e. at the residential dwellings to the south west).

4.3.8 In order to control noise breakout from the delivery process, it is recommended that an acoustic barrier is constructed along the south western perimeter of the loading bay service area (see location in Appendix 2). In order to be effective, the barrier should fully break the line of sight from the noise source (which is trolleys pushed from the HGV into the warehouse) and the receptor. It is estimated that a circa 2 metre high barrier would be required (subject to confirmation using a detailed section plan). A solid, close boarded timber fence can be a suitable barrier





provided it has a mass per unit area of  $\geq 10 \text{ kg/m}^2$ , is fully sealed to the ground and is fitted with cover strips to prevent gaps forming over time.

4.3.9 With the barrier in place there is considered to be no necessity to restrict delivery hours to the site.

#### 4.4 **CUSTOMER CAR PARK**

4.4.1 The proposed store layout includes for the provision of 70 no. car parking spaces.

4.4.2 ENS has previously undertaken noise measurements at 10 metres from the boundary of a major supermarket car park and the measured noise levels were of the order of 48 dB  $L_{Aeq}(1 \text{ hour})$ .

4.4.3 The nearest noise sensitive receptors to the car park are the primary care uses on the far side of Glen Street, which are located approximately 20 metres from the car park boundary. Given that the measured baseline noise levels during the daytime and evening periods were 59 dB  $L_{Aeq,T}$  and 45 dB  $L_{A90,T}$ , respectively, it is considered that the use of the customer car park will have no noise impact on the amenity of the nearest noise sensitive receptors.

## **SECTION 5 CONCLUSIONS**

5.1 A noise impact assessment has been undertaken for a proposed Aldi store on land off Station Road, Stanley.

5.2 It is considered that the control of noise associated with external refrigeration plant can be achieved using the standard Aldi plant module.

5.3 Noise associated with deliveries should not lead to any unacceptable loss of amenity at the nearest receptors with an acoustic barrier in place and there is considered to be no necessity to restrict delivery hours to the site.

5.4 It is also considered that the use of the customer car park will have no noise impact on the amenity of the nearest noise sensitive receptors.

5.5 On this basis, noise is not considered to represent a constraint to the proposed development.



**APPENDIX 1**    ▪    Glossary of Acoustic Terms

## APPENDIX 1 GLOSSARY OF TERMS

Sound is transmitted to the ear by pressure fluctuations in the air at different frequencies. The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from  $20 \times 10^{-6}$  Pascals to 200 Pascals, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB), with 0 dB representing the normal threshold of hearing ( $20 \times 10^{-6}$  Pascals) and 120 dB representing the threshold of pain (20 Pascals). In general terms, a person can hear mid frequencies (500 Hz, 1000 Hz and 2000 Hz) more effectively than lower or higher frequencies. A young person can hear sound from around 20 to 20,000 Hz. As one gets older the ability to hear higher frequencies diminishes.

A change in sound level of less than 3 dB is not perceptible under normal conditions and a change of 10 dB subjectively equates to a doubling or halving of the loudness of a sound.

The ear is frequency sensitive, in that it doesn't ascribe the same importance to all frequencies in the audible frequency range. A frequency filtering system in a sound level meter approximates the frequency response of the human ear. This weighting network is called "A-weighting" and the "A-weighted" sound pressure level is expressed in dB(A). This weighting is typically used to measure and assess environmental noise.

As sound levels are constantly fluctuating, a number of statistical metrics are used to describe the sound. The most commonly used measurement descriptors of environmental noise are as follows:

- $L_{Aeq,T}$  - The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. This is in effect the average noise level, used to describe the ambient (all encompassing) noise level.
- $L_{A90,T}$  - The A-weighted sound pressure level in decibels exceeded 90% of a given time interval, T.  $L_{A90}$  is typically taken as representative of background noise.
- $L_{AFmax}$  - The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes a fast time weighting, which equates to the time averaging of the human ear.

The ambient noise is defined as the totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.

For the assessment of noise, the 24 hour day is typically broken down into two or three segments, consisting of daytime from 07:00 to 23:00 hours (further divided to daytime from 07:00 to 19:00 hours and evening from 19:00 to 23:00 hours) and night time from 23:00 to 07:00 hours.

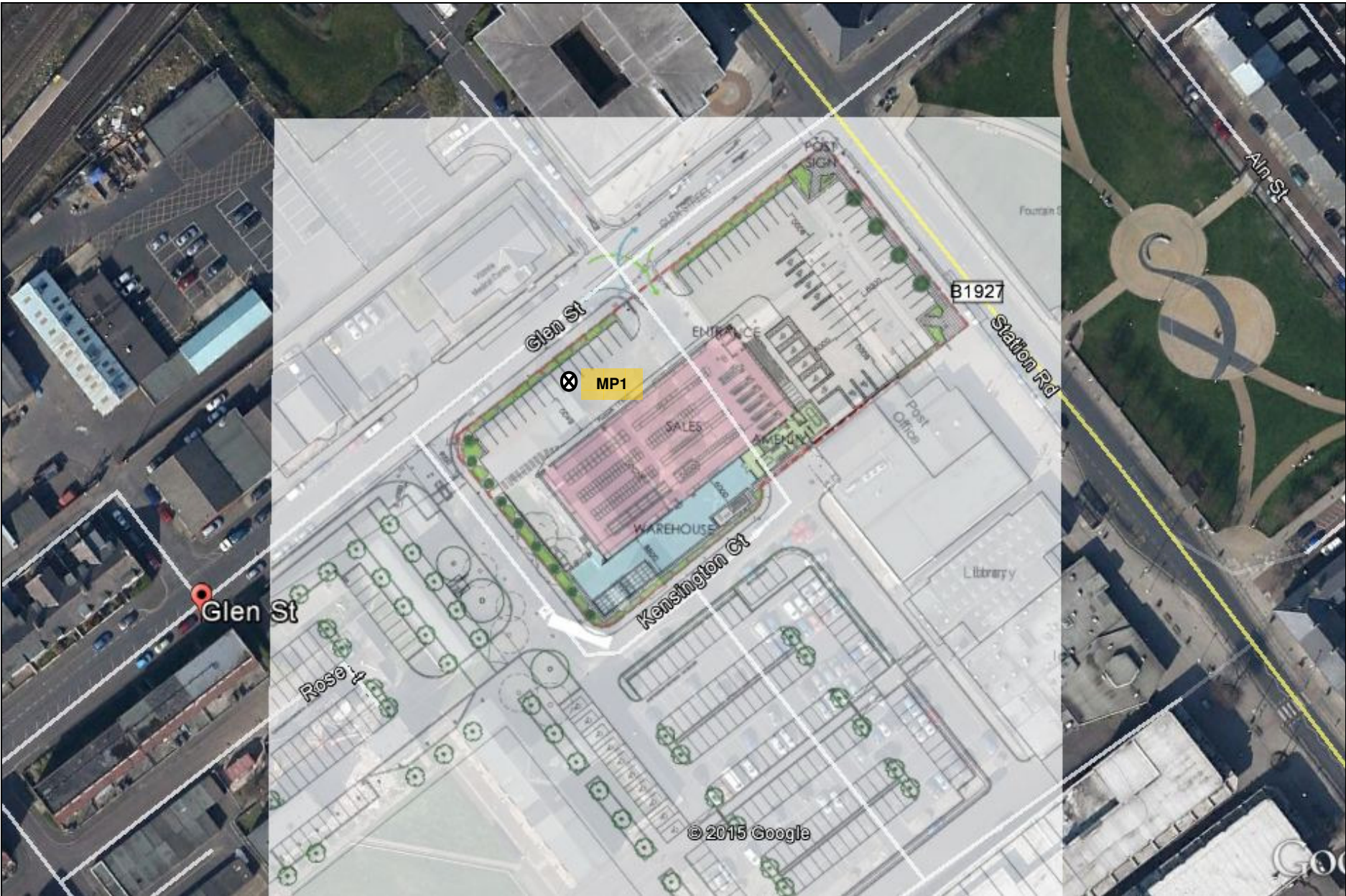
The Sound Exposure Level (SEL or  $L_{AE}$ ) is the energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

The weighted sound reduction index ( $R_w$ ) is the single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies ( $R_w$  is used to characterise the insulation of a material or product that has been measured in a laboratory).



**APPENDIX 2**    ▪    Drawings

Appendix 2  
Site Location and Noise Monitoring Position



Appendix 2  
Proposed Site Layout Plan

