ACOUSTIC DESIGN TECHNOLOGY
Noise and Vibration Consultants

ADT 2333

21 January 2016

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PROPOSED DEVELOPMENT, BARNSLEY ROAD, GOLDTHORPE

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

ACOUSTIC CONSULTANCY REPORT ADT 2333/ENIA

Revision	Date	Issued By	Revision Notes
-	20 January 2016	Chris Middleton	First issue
A	20 January 2016	Chris Middleton	Minor revisions
B	21 January 2016	Chris Middleton	Revised for split application

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1.0 SUMMARY

The proposal is to redevelop the site to construct two retail units with associated access, car parking and landscaping. Each retail unit will be the subject of a separate planning application.

Acoustic Design Technology Limited have previously undertaken an environmental noise survey to determine the typical ambient noise levels in the surrounding area.

BS 4142:2014 rating level limits have been proposed for the new fixed plant installations, which should yield no observed effect.

Analysis of noise associated with servicing indicates that the noise impact on surrounding noise sensitive properties should equate to no observed adverse effect.

Analysis of the noise generated by the car park indicates that the noise impact on surrounding noise sensitive properties should equate to no observed adverse effect.

2.0 BASIS OF ASSESSMENT

2.1 Introduction

The purpose of the report is to assess the environmental noise impact of the proposed retail units on nearby noise sensitive properties.

Barnsley Metropolitan Borough Council recently granted planning permission (reference no. 2014/1020) for an Aldi food store on the neighbouring land to the west. Survey data from the report ADT 2081/ENIA dated 15 August 2014 prepared in support of that application has been re-used in the production of this report.

2.2 Site Location

The site is located on Barnsley Road near the roundabout junction with the A635 on the outskirts of Goldthorpe, and is currently agricultural land.

The surrounding area is predominantly agricultural, with farm land to the north, southwest and west of the site, a farmhouse with associated outbuildings to the northwest, and a residential estate to the east. Goldthorpe Industrial Estate lies around 350m away to the south, and the A1(M) is some 7 ½ km away to the east.

As noted in Section 2.1 above, the land immediately to the west of the site was recently granted planning permission for a food retail unit.

2.3 Proposed Development

The proposal is to redevelop the site to create two retail units with associated access, car parking and landscaping as indicated on the drawings for each application.

Proposed opening hours and delivery periods are as follows:

	Aldi
Opening hours Monday to Saturday	08:00 - 22:00
Opening hours Sunday (any six hours between)	10:00 - 17:00
Delivery hours Monday to Saturday	07:00 - 23:00
Deliveries Sundays & Bank Holidays	08:00 - 18:00

Deliveries to the large retail unit will be taken daily via a dedicated service yard at the north end of the site, with the facility for vehicles to back up to the loading bay door to unload stock directly into the store. The smaller unit is expected to be serviced less frequently by smaller vans using the car park.

2.4 Planning Policy

The National Planning Policy Framework (NPPF) sets out the general terms of reference for sustainable development, including noise. Section 123 states that:

Planning policies and decisions should aim to:-

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development
- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not

have unreasonable restrictions put on them because of changes in nearby land uses since they were established and

- identify and protect areas of tranquility which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason

However, neither the NPPF nor the supplementary guidance Noise Policy Statement for England (NPSE) contain any fixed noise criteria, assessment methods or references to established standards such as BS 4142 or BS 8233.

For this development the key principle to be applied from the NPPF is to protect existing residents from noise generated by the development.

The Planning Practice Guidance (Noise) defines the action to be taken for various effect levels, based on perception of noise and typical outcomes. These are provided in the attached table 2333/T1.

2.5 Assessment Criteria

On a national level there is no common consensus on the most appropriate methods for assessing noise from commercial developments. Some noise sources are clearly industrial in nature, such as fixed plant and deliveries while others are a form of traffic noise, such as lorry movements and car parking.

For industrial noise sources such as fixed plant installations the most appropriate assessment method is BS 4142:2014. The scope of the standard now extends to the loading and unloading of goods.

For traffic-type sources such as the car park the criteria from BS 8233:2014 are more appropriate, as follows:

Location	$L_{Aeq, T}$ dB
Living rooms (07:00 - 23:00 hours)	35 - 40
Bedrooms (23:00 - 07:00 hours)	30
Outdoor living areas (07:00 - 23:00 hours)	50 - 55

2.6 Nearest Noise Sensitive Properties

The various noise sensitive properties in the surrounding area have been grouped into two noise sensitive areas (NSA), as described below and marked on the attached site plan 2333/SP1.

NSA	Location	Direction	Approximate distance from site boundary (metres)	Approximate distance from proposed building (metres)
1	Houses on Mulberry Close	east	15 metres	75 metres
2	Farmhouse off Hollygrove Roundabout	west	250 metres	260 metres

The above NSA represent the closest noise sensitive properties, with others located further from the site and in some cases screened by the intervening buildings. A satisfactory noise impact determined at the defined NSA should, therefore, also apply to other noise sensitive areas.

2.7 Strategy for Noise Impact Assessment

As noted in Section 2.1 above, an environmental noise survey has already been undertaken in support of the planning application for the adjoining retail development.

The strategy for the noise impact assessment of this development is as follows:

i. re-use the environmental noise survey data from the previously issued report ADT 2081/ENIA, as described in Section 3.0 below.

ii. set environmental noise limits for new fixed plant installations in accordance with BS 4142:2014, as described in Section 4.0 below.

iii. assess the noise impact of deliveries in accordance with BS 4142:2014, as described in Section 5.0 below.

iv. assess the noise impact of the car park against the BS 8233:2014 criteria, as described in Section 6.0 below.

3.0 ENVIRONMENTAL NOISE SURVEY DATA

3.1 Summary

The results of the survey undertaken in support of the previously issued report ADT 2081/ENIA are reproduced in the attached table 2333/T1, with the measurement positions marked on the attached site plan 2333/SP1.

As the survey was undertaken recently (July 2014) the results should be representative of the current noise climate.

4.0 NOISE IMPACT ASSESSMENT (NEW FIXED PLANT)

4.1 Basis of Assessment

At this stage none of the major fixed plant installations have been selected, so it is not possible to undertake a noise impact assessment of specific equipment.

Environmental noise limits have therefore been proposed, which can then be used in the future selection of plant and any associated attenuation.

4.2 Noise Limits

As described in Section 2.7 above, it is proposed that plant noise is assessed using the BS 4142:2014 method, and a rating level on a par with the typically prevailing background level is defined as a 'low impact'.

Proposed noise limits for fixed plant are therefore as follows:

Recommend BS 4142:2014 rating level limits for fixed plant L_{Ar} dB		
Location	Day (07:00 - 23:00)	Night (23:00 - 07:00)
All NSA	35*	28

* Note:- A plant noise rating level matching the existing day time background noise levels measured in excess of L_{A90} 56 dB is not considered appropriate, and a limit of 35 dB is therefore proposed.

Following the selection of the new plant, cumulative noise levels can be calculated at the various NSA and checked against the above limits. According to the Planning Practice Guidance, this should equate to 'no observed effect'.

5.0 NOISE IMPACT ASSESMENT (SERVICING)

5.1 Basis of Assessment

As described in Section 2.3 above, the developer is seeking to deliver to the retail units during the day only (07:00 to 23:00).

For the large unit, it is expected that unloading will take place either with the trailer backed up to the loading bay door or externally using lightweight trolleys or similar, with no refrigerated lorries required.

Potential noise emissions from servicing activities at the large unit are therefore as follows:

i. the manoeuvring of the lorries in the service yard
ii. unloading lorries (nominally 30 minutes per hour)
iii. waste collections

There is not expected to be any other significant activity outside the building, with unpacking, sorting, waste compaction and wrapping all taking place internally.

Typical noise data for the principal noise sources associated with servicing operations (sources i) to ii) above) is set out in Appendix B.

Noise from waste collections has not been specifically included in the assessment as it occurs relatively infrequently and the noise varies considerably according to the type of waste collected. For most retail developments in noise sensitive locations it would be normal to schedule waste collection for non-sensitive day-time hours only.

Noise from servicing of the small retail unit has not been assessed in detail, on the basis that the scale of operations is expected to be substantially smaller, similar in nature and frequency to home deliveries on a residential estate.

5.2 Predicted Noise Levels

Noise emissions from deliveries can be assessed using various parameters, although as all operations will take place during the day, the $L_{Aeq,\ 1\ hour}$ is the most appropriate measure.

The HGV manoeuvre was modelled as a moving point source based on the vehicle track shown on the application drawings with a speed of 5 km/h for the forward components and 3 km/h for the reverse component.

The vehicle engine was assumed to be running with the vehicle stationary for 30 seconds before departing.

Based on the information set out in Section 5.1 above, predicted $L_{Aeq,\ 1\ hour}$ are set out in the following table:

Location	Predicted $L_{Aeq,\ 1\ hour}$ dB
NSA1 Mulberry Close	40
NSA5 Farmhouse	27

5.3 Noise Impact Assessment

A comparison of the $L_{Aeq,\ 1\ hour}$ in Section 5.2 above with the daytime noise levels reveals that the worst case predicted level of 40 dB is well below the day time $L_{Aeq,T}$ and L_{A90} at any position. In other words, the noise from servicing operations would be completely drowned out by the traffic.

When assessed using BS 4142:2014, it would be appropriate to apply a + 6 dB for clearly perceptible impulsivity, although this would still yield a rating level of only $L_{Ar,\ 1\ hour}$ 46 dB at worst, which is well below the lowest day time background level of L_{A90} 56 dB. This is well within the BS 4142 definition of 'low impact'.

Thus, according to the Planning Practice Guidance, it is reasonable to conclude that the noise would be audible but unlikely to have any effect on behaviour or attitude, equating to 'no observed adverse effect'.

6.0 NOISE IMPACT ASSESSMENT (CAR PARK)

6.1 Basis of Assessment

There are no widely accepted UK standards for the assessment of noise from car parks, as the noise cannot be categorised as industrial or as free flowing traffic.

In the absence of a relevant British or International Standard for predicting car parking noise, the Bavarian LfU-2007 parking lot function incorporated into Cadna/A noise mapping software has been used to calculate $L_{Aeq,1hour}$ at the various NSA.

Peak flows are nominally assumed to be 2 movements per space per hour, and significantly lower flows at the beginning and end of store opening hours.

6.2 Noise Impact Assessment

Based on the information in Section 6.1 above, analysis predicts the following resultant noise levels at the noise sensitive areas for the peak hour:

Location	Predicted $L_{Aeq,\ 1\ hour}$ dB
NSA1 Mulberry Close	51
NSA5 Farmhouse	25

At the more sensitive beginning and end of the day the car park noise levels would reduce. For example, at 25% capacity the levels would be 6 dB lower.

All of the above levels are well within the BS 8233:2014 criteria for outdoor living areas during the day, and as with the service yard noise, they would be largely drowned out by the existing road traffic noise.

It would therefore be reasonable to conclude that the noise impact of the car park should equate to 'no observed adverse effect' within the Planning Practice Guidance.

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Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. 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			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, 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 perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 2333/T1



Notes	Description	
	Site plan showing noise monitoring locations	
	Project Proposed Development, Barnsley Road, Goldthorpe	
	Survey Date 24th July 2014	**Drawing No.** 2333/SP1

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SURVEY RESULTS (A WEIGHTED TIME HISTORY)

Position	Period	$L_{Aeq, 10mins}$ dB	L_{Amax} dB	L_{A90} dB
1	02:00 - 03:00	56	83	31
	03:00 - 04:00	54	79	32
	04:00 - 05:00	61	86	31
	05:00 - 06:00	67	87	48
	06:00 - 07:00	70	85	53
	07:00 - 08:00	73	97	56
	08:00 - 09:00	73	86	58
2	02:00 - 03:00	61	79	36
	03:00 - 04:00	57	74	34
	04:00 - 05:00	58	72	41
	05:00 - 06:00	61	78	45
	06:00 - 07:00	69	83	58
	07:00 - 08:00	69	80	56
	08:00 - 09:00	70	81	62
3	02:00 - 03:00	62	88	28
	03:00 - 04:00	68	91	35
	04:00 - 05:00	72	91	42
	05:00 - 06:00	77	92	56
	06:00 - 07:00	78	93	50
	07:00 - 08:00	81	93	57
	08:00 - 09:00	80	93	62

Table 2333/T1

APPENDIX A

Acoustic Terminology

The annoyance produced by noise is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and any variations in its level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

A-weighting — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the A-weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average person. It is also possible to calculate the A-weighted noise level by applying certain corrections to an un-weighted spectrum.

When the noise being measured has variable amplitude, such as traffic noise, it is necessary to qualify the basic dB unit. This may be done using a statistical index L_n dB, where n is any value between 0 and 100, and is the percentage of the sample time for which the stated level is exceeded. In defining the use of the index, both the value of n and the length of the sample period must be stated.

L_{10} — L_{10}, being the level exceeded for 10% of the time, has been shown to be a good indicator for traffic noise intrusion, and is used in assessing the effect of traffic noise on residential or commercial premises.

L_{90} — L_{90} is the level exceeded for 90% of the time, and is used as a measure of background noise level, as it excludes the effects of occasional transient levels, such as individual passing cars or aircraft.

In addition to the statistical noise indices defined above, the following noise units are also used to define variable amplitude noise sources:

$L_{eq,T}$ — $L_{eq,T}$ is defined as the notional steady sound pressure level which, over a stated period of time, would contain the same amount of acoustical energy as the actual fluctuating sound measured over the same period. In other words, it is a measure of the "average" noise level

L_{max} — L_{max} is the maximum time-weighted sound pressure level recorded over the stated time period

APPENDIX B

Service Yard Noise Data

Noise data: $L_{eq, T}$ at 5m									
	63	125	250	500	1k	2k	4k	8k	**A-wt**
Unloading - lorry backed up to rubber surrounds (source at 2m height)	69	63	60	57	54	54	53	46	**61**
HGV manoeuvring (source at 1.25m height)	80	71	66	69	70	69	62	53	**74**
HGV start and idle (source at 1.25m height)	82	72	69	69	69	70	66	64	**75**