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Client:	ASDA Stores Ltd			
Report Title:	Assessment of Servicing Noise			
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1.0 Introduction

ASDA Stores Ltd is to submit an application seeking to extend the delivery period at the retail food outlet located at Barwell Lane, Hinckley LE10 1SS. At present, the delivery periods to the store are restricted by condition No. 8 of the permission for application 91/0475/4, which states that:

> *"There shall be no deliveries to the supermarket by service vehicles between 8.00 pm and 7.00 am on Mondays to Saturdays and at no times on Sundays. During permitted times no vehicle shall enter or leave the supermarket by the customer parking access as indicated on the submitted plans"*

The proposal seeks permission for deliveries on Sunday from 08:00 hours to 17:00 hours. The objective of this report is to provide a technical assessment of the proposal with a view to establishing whether or not any significant adverse effect on the amenity of the existing interests in the locality would occur.

2.0 Site Description

The site and its adjoining uses are illustrated by plan in Appendix A.

The store is located off Barwell Lane, Hinckley, Leicestershire, in an area generally residential in character.

The site is bounded to the north by the Barwell Lane, a moderately trafficked two-way road that connects with the B4667 Ashby Road approximately 60 metres to the west and Harwood Drive approximately 670 metres to the east. The northeast and northwest extremes of the site are delineated by the rear gardens of the semi-detached dwellings that have frontages on Ashby Road and Barwell Lane respectively. These premises extend to two-storeys in height and are possessed of domestic grade openable windows.

Immediately to the east of the store is the main customer car park area, beyond which lie the rear gardens of the premises fronting Stoneygate Drive. A close boarded timber fence of approximate height 1.9 metres delineates the boundary in this aspect.

The servicing facilities are located at the northwest corner of the store, being set back from Barwell Lane by approximately 44 metres. Access is facilitated by means of a dedicated service road that has a junction with Barwell Lane.

3.0 Guidance on the Assessment of Noise Levels

The purpose of any criterion or standard for environmental noise should be to safeguard against unacceptable levels of community response. This response may manifest itself as a feeling of annoyance[1] during the daytime and/or disturbance during the night. The chief sources of information on the relationship between noise exposure and community response are field studies that comprise both noise measurement surveys and social

[1] Annoyance has been defined by the WHO as "a feeling of displeasure evoked by noise"

surveys (or activity monitoring for effects such as sleep disturbance) which then attempt to establish a correlation between the two sets of results.

At present, there is little in the way of such field studies that have set out to determine community response to noise from supermarket service yards. This is not altogether surprising since social surveys are expensive and time consuming to conduct, and as a result have focused on sources that affect the wider community. In the absence of any definitive guidance and in order to establish suitable criteria, it is necessary to rely on the more general guidance and assessment methods used for other sources of community noise. These are discussed in the following sections.

3.1 PPG 24 Planning Policy Guidance: *"Planning and Noise"*

Planning policy guidance note PPG 24 gives guidance to local authorities in England on the use of their planning powers to minimise the adverse impacts of noise and builds upon the advice previously contained in DoE Circular 10/73.

The PPG outlines the considerations to be taken into account in determining planning applications both for noise-sensitive developments and for those activities that will generate noise. It introduces important standards and references including BS 8233:1987 *"Sound insulation and noise reduction for buildings"*, CRTN *"Calculation of road traffic noise"*, BS 7445 *"Description and measurement of environmental noise"*, BS 6472:1992 *"Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)"*etc..

The concept of noise exposure categories for residential development is also introduced, and recommendations are made regarding appropriate levels of exposure to different sources of noise. However, Annex 1 of the PPG it is stated that:

> *"the NEC procedure is only applicable where consideration is being given to introducing residential development in an area with an existing noise source, rather than the reverse situation where new sources are to be introduced into an existing residential area."*

The reason given in the PPG is as follows:

> *"This is because the planning system can be used to impose conditions to protect incoming residential development from an existing noise source but, in general, developers are under no statutory obligation to offer noise protection measures to existing dwellings which will be affected by a proposed new noise source."*

Annex 3 of the PPG provides guidance on the assessment of noise form different sources. Paragraphs 19 and 20 deal with noise from industrial and commercial developments and state that:

> *"The likelihood of complaints about noise from industrial and commercial development can be assessed, where the Standard is appropriate, using guidance in BS 4142:1990.Tonal or impulsive characteristics of the noise are likely to increase the scope for complaints and this is taken into account by the "rating level" defined in BS 4142. The "rating level" should be used when stipulating the level of noise that can be permitted. The likelihood of complaints is indicated by the difference between the noise from the new development (expressed in terms of the rating level) and the existing background noise. The Standard states that "A difference of around 10 dB or higher indicates that complaints are likely. A difference of around 5 dB is of marginal significance. Since background (L_{A90}) noise levels vary*

throughout a 24 hour period it will usually be necessary to assess the acceptability of noise levels for separate periods (e.g. day and night) chosen to suit the hours of operation of the proposed development."

The Annex goes on to say that:

"Commercial developments such as fast food restaurants, discos, night clubs and public houses pose particular difficulties, not least because associated activities are often at their peak in the evening and late at night. Local planning authorities will wish to bear in mind not only the noise that is generated within the premises but also the attendant problems of noise that may be made by customers in the vicinity. The disturbance that can be caused by traffic and associated car parking should not be underestimated."

3.2 World Health Organisation 1999 *"Guidelines for Community Noise"*

This document provides a review of the effects of noise and a description of the principles of the WHO health criteria and guidelines for Community Noise.

Table 1 of the document summarises the WHO's guideline values for community noise and includes the noise indices and time base to be adopted. The guideline values relate to specific environments and critical health effects, with noise limits being set for each health effect using the lowest noise level that produced an adverse health effect. The WHO definition of an adverse health effect is also particularly noteworthy as it refers to:

"Any temporary or long-term impairment of physical, psychological or social functioning that is associated with noise exposure."

The relevant extracts of Table 1 are reproduced thus:

Specific environment	Critical health effect(s)	L_{Aeq} dB	Time base hours	L_{AFmax} dB
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance daytime & evening	35	16	
	Sleep disturbance, night-time	30	8	45
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

3.3 BS 4142:1997 *"Method for rating industrial noise affecting mixed residential and industrial areas"*

This standard provides a method by which the impact of noise from factories, industrial premises, fixed installations and noise sources of an industrial nature in commercial premises can be predicted in terms of the likelihood of complaints arising from people residing in nearby dwellings. The standard is intended to be used for assessing the measured or calculated noise levels from both existing and new or modified premises.

The likelihood that an individual will complain depends on individual attitudes and perceptions in addition to the noise levels and acoustic features present. The standard however, is only concerned with the rating of a noise based on the margin by which it

exceeds a background noise level, with an appropriate allowance for any acoustic characteristics that may be present.

In general, a noise is likely to cause complaints when it exceeds the background by a certain margin:

- a difference of around +10 dB or more indicates that complaints are likely;
- a difference of around +5 dB is of marginal significance;
- if the rating level is more than 10 dB below the measured background noise level then this is a positive indication that complaints are unlikely.

An important cautionary note is included within the standard:

> *"the user is reminded that this standard is not based on substantive research but rather on accumulated experience"*

It is also stated that the method is not suitable for assessing noise measured inside buildings or when the background and rating levels are both very low[2].

4.0 Subjective Impression of Noise Increases

The following Table provides a semantic scale that may be used to subjectively rate changes in sound pressure level.

Table 1: Subjective effect of changes in sound pressure level[3]

Change in sound level dB	Change in power		Change in apparent loudness
	Decrease	Increase	
3	½	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half or twice as loud
20	1/100	100	Much quieter or louder

5.0 Noise Measurements

Detailed noise surveys have been undertaken at site to quantify ambient noise levels at site over the Sunday morning period. Measurements were made on the 01st June 2008 at the following locations as illustrated in Figure 1914/SK1 of Appendix A:

- **MP1:** Staff car park area, to the rear of the dwellings of Barwell Lane;
- **MP2:** North east corner of the main customer car park, to the rear of the dwellings of Stoneygate Drive.

The measurements obtained at position MP1 were considered representative of the lowest background and ambient noise levels encountered at the dwellings of Barwell Lane proximal to the service yard area. In addition and in the interests of a robust assessment, measurements were obtained at a location remote from the service yard

[2] For the purposes of the standard, background noise levels below about 30 dB and rating levels below about 35 dB are considered to be very low.

[3] Bies and Hansen *"Engineering Noise Control Theory and Practice"*

area and staff car park, denoted MP2, to ensure that underlying background and ambient noise climate was accurately established in absence of any store generated activity. The survey period covered circa 07:30 to 12:30 hours, although measurements at MP2 were ceased at around 10:00 hours due to influence of vehicular movement in the main customer car park area once the store opens. It was not considered necessary to extend the survey period beyond 12:30 hours as the measurement results showed the ambient noise climate at site to be stable, i.e., showing little variation.

Measurements were undertaken using a 10-minute sample period. The sound level meter was tripod mounted such that the microphone diaphragm was 1.5 metres above the local ground plane. The quantities recorded included:

- $L_{Aeq,T}$: equivalent continuous noise level over the measurement period, T;
- L_{AFmax}: maximum sound pressure level (Fast time-weighting);
- $L_{AF10,T}$: noise level exceeded for 10% of the measurement period T, (Fast time-weighting);
- $L_{AF90,T}$: noise level exceeded for 90% of the measurement period T, (Fast time-weighting).

Sound pressure level measurements were obtained using the following instrumentation complying with the Type 1 specification of BS EN ISO 60651:1994, BS EN ISO 60804:1994, ANSI S1.4-1985, ANSI S1.43-1997 and applicable parts of DIN 45 657:

- Norsonic Type 118 Sound level meter;
- Norsonic Type 1225 ½" microphone.

Calibration checks were made prior to and after completion of measurements using a Norsonic Type 1251 acoustical calibrator complying with Class 1 of IEC 942 (1988), calibration level 114.0 dB ± 0.3 dB, @ 1.0 kHz.

All instrumentation carried a current manufacturer's certificate of conformance.

Weather conditions during the survey periods were mild and still, with no precipitation.

The data at both positions are considered to be free field values due to the minimal influence of reflected sound other than from the local ground plane.

6.0 Noise Survey Results

The measurement data are reproduced in full in Appendix B and summarized in Table 2 below.

Table 2: Summary of Noise Survey Results

File	Date and Time	Position	Sound Pressure Level, dB re 20µPa			
			$L_{Aeq,T}$	L_{AFmax}	$L_{AF10\%}$	$L_{AF90\%}$
080601_0001.NBF	(2008/06/01 07:37:08.00)	MP1	45.9	51.0	47.8	44.2
080601_0003.NBF	(2008/06/01 07:51:43.00)	MP2	48.9	58.4	52.3	42.2
080601_0004.NBF	(2008/06/01 08:20:56.00)	MP1	45.5	58.5	47.5	42.3
080601_0005.NBF	(2008/06/01 08:44:50.00)	MP2	48.3	67.2	50.6	41.8
080601_0006.NBF	(2008/06/01 09:18:47.00)	MP1	46.7	59.3	48.9	43.5
080601_0007.NBF	(2008/06/01 09:38:25.00)	MP2	52.3	67.5	55.4	46.0
080601_0008.NBF	(2008/06/01 10:11:50.00)	MP1	47.6	61.2	49.2	45.1
080601_0009.NBF	(2008/06/01 11:23:39.00)	MP1	46.5	54.8	47.8	44.7
080601_0010.NBF	(2008/06/01 12:09:16.00)	MP1	46.2	59.5	49.5	45.1

7.0 Calculation of Servicing Noise Levels

As noted above, the service yard facility is accessed via a dedicated access road that has a junction with Barwell Lane. Delivery vehicles approach the store along Barwell Lane travel in a southerly direction along the access road towards the service yard. The delivery vehicles then turn through 90 degrees and reverse up to the unloading area.

Produce is unloaded from the wagon via a scissors lift or by forklift, with goods being transferred into the store's bulkstock area. Following completion of the unloading process; the vehicle moves away in a forward gear, undertakes a multi-shot turn, drives along the service yard access road and depart the site along Barwell Lane.

The delivery process essentially comprises three main elements; vehicle arrival, vehicle unloading and vehicle departure. Considering arrivals and departures, the path taken by the delivery vehicle has been modelled as a series of straight-line segments to approximate the path travelled by the vehicle. HGV noise emissions have been assumed as constant and independent of vehicle speed, since tyre noise is not significant in comparison to noise from the engine and exhaust. Calculations assume point source radiation as the vehicle travels along each segment, with a correction then applied to account for the time of traverse and site specific conditions; screening, reflections etc.. This approach has been derived from observations of vehicle manoeuvring operations at numerous comparable supermarket stores.

With regard to unloading, a fixed source position has been taken for both the unloading/ transfer of goods into the store. Point source attenuation has been assumed throughout, based on the shortest measured distance between source and receiver. Noise levels have been assumed as continuous over the relevant assessment and periods.

Source sound power level data for a chilled goods delivery is set out in Table 3, having been taken from an extensive library of activity noise measurements obtained at numerous other comparable existing supermarket sites.

Table 3: Summary of noise levels for typical service yard activities

Activity	1/1 Octave band Sound Power Level L_w, dB re 10^{-12} W								A
	63	125	250	500	1k0	2k0	4k0	8k0	
16.5m Chilled HGV arrival	101	86	85	87	88	84	79	78	91
16.5m Chilled HGV departure	89	84	83	88	86	82	78	70	90
Gas forklift loading/unloading	92	89	87	85	83	83	80	79	90
HGV unloading via scissors lift	79	77	73	75	77	80	81	79	86
Movement of produce cages	89	85	84	83	83	82	79	73	88

As the proposals seek permission for deliveries during the day, the reference time interval is 60 minutes according to the procedures contained in BS 4142:1997. The following on-times have been assumed, based on extensive observations at other comparable existing supermarket sites.

- 16.5m Chilled HGV arrival: 2 minutes;
- 16.5m Chilled HGV departure: 1 minute;
- Gas forklift loading/unloading HGV: 30 minutes;
- HGV unloading via scissors lift 30 minutes;
- Movement/stacking of produce cages: 30 minutes (at each of 2 separate locations).

In order to quantify any impacts associated with the proposals, a detailed three dimensional computer model of the locality has been constructed using CADNA A software, Figure 1 isometric illustrating the "existing case", which implements the procedures contained in relevant documents such *"Calculation of Road Traffic Noise"*, ISO 9613-2: *"Acoustics - Abatement of sound propagation outdoors, Part 2: General method of Calculation"* etc.. The sound power level data set out in Table 3 above have been used as input emission values to produce $L_{Aeq,1h}$ noise levels at the dwellings proximal to the servicing area.

For the calculation purposes, three orders of mirror source reflection have been allowed for using ray tracing as experience has shown that this approach accurately models noise propagation in situations where multiple plane reflecting surfaces are present.

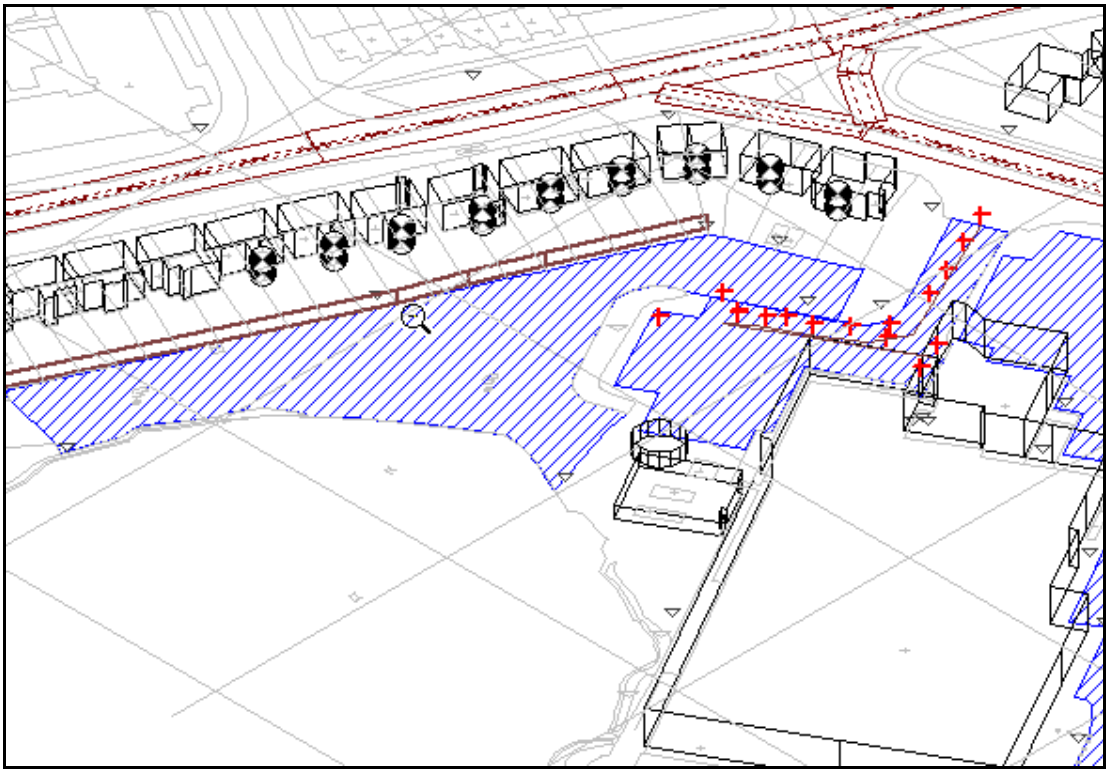


Figure 1: CADNA A Isometric – Existing Case

7.1 Results

On the basis of the data and methodology set out above, the following existing case facade noise levels are predicted.

Table 4: Predicted $L_{Aeq,1h}$ Noise Levels due to Servicing Activity

Receiver	Elevation	Floor	Predicted Facade $L_{Aeq,1h}$ Noise Level
8 to 10 Barwell Lane	Rear	Ground	53 dB
		First	54 dB
4 to 6 Barwell Lane	Rear	Ground	52 dB
		First	53 dB
120 Ashby Road	Rear	Ground	50 dB
		First	51 dB
116 to 118 Ashby Road	Rear	Ground	45 dB
		First	50 dB
112 to 114 Ashby Road	Rear	Ground	46 dB
		First	50 dB
108 to 110 Ashby Road	Rear	Ground	45 dB
		First	49 dB
104 to 106 Ashby Road	Rear	Ground	42 dB
		First	46 dB
100 to 102 Ashby Road	Rear	Ground	40 dB
		First	44 dB

7.2 Evaluation of Servicing Noise

British Standard BS 4142:1997 may be used as part of the assessment of servicing noise. As discussed previously, the standard provides a method by which the impact of noise from factories, industrial premises, fixed installations and noise sources of an industrial nature in commercial premises can be predicted in terms of the likelihood of complaints arising from people residing in nearby dwellings.

Examination of Table 4 indicates that the highest predicted servicing noise levels are likely to occur in the proximity of the rear elevation of 8 to 10 Barwell Lane. An assessment has therefore been carried out in accordance with BS 4142:1997 to determine the likelihood of complaint at this location. The following data result:

Table 5: BS 4142:1997 Assessment
8 to 10 Barwell Lane, First Floor, Rear Elevation

Results		**Relevant clause**	**Commentary**
Predicted noise level	$L_{Aeq,60min}$ = 54 dB	6.3.5	*Unloading of HGV and service yard activity.*
Lowest Background level (Table 2, Façade corrected)	$L_{A90,10min}$ = 45 dB	7.3	*Background measured in the absence of servicing*
Assessment to be made during the day time thus the reference time period is 60 minutes			
Specific noise level	$L_{Aeq,60min}$ = 54 dB	6.3	
Acoustic feature correction	+5 dB	8.2	*The noise contains distinct impulses*
Rating level	(54+5) dB = 59 dB	8.3	
Background level	$L_{A90,10min}$ = 45 dB		
Excess of rating over background level	**(59-45) dB = 14 dB**	9	
Assessment indicates that *"complaints are likely"*			

Examination of Table 5 would indicate that complaints are likely when assessing servicing noise in accordance with BS 4142:1997. Consequently, a mitigation scheme would be required in order to offset any potential loss of amenity.

8.0 Mitigation

8.1 Acoustic Screening

In order to offset the projected noise increases set out in the foregoing section, a significant mitigation scheme would be required. Further calculations have been carried out assuming provision of a 2.5 metre high acoustic screen local to 8 to 10 Barwell Lane, the extent of which is illustrated below. In addition, a 4 metre high absorptive acoustic screen projecting west from the northern corner of the store's bulkstock area returning south at a height of 3 metres would be required. New solid, imperforate service yard gates to be included as part of the northern extent of screen would need to be provisioned for, these to remain closed at all times during which servicing would occur. The screening proposals are indicated by plan and aerial view on Figures 2 and 3 respectively.

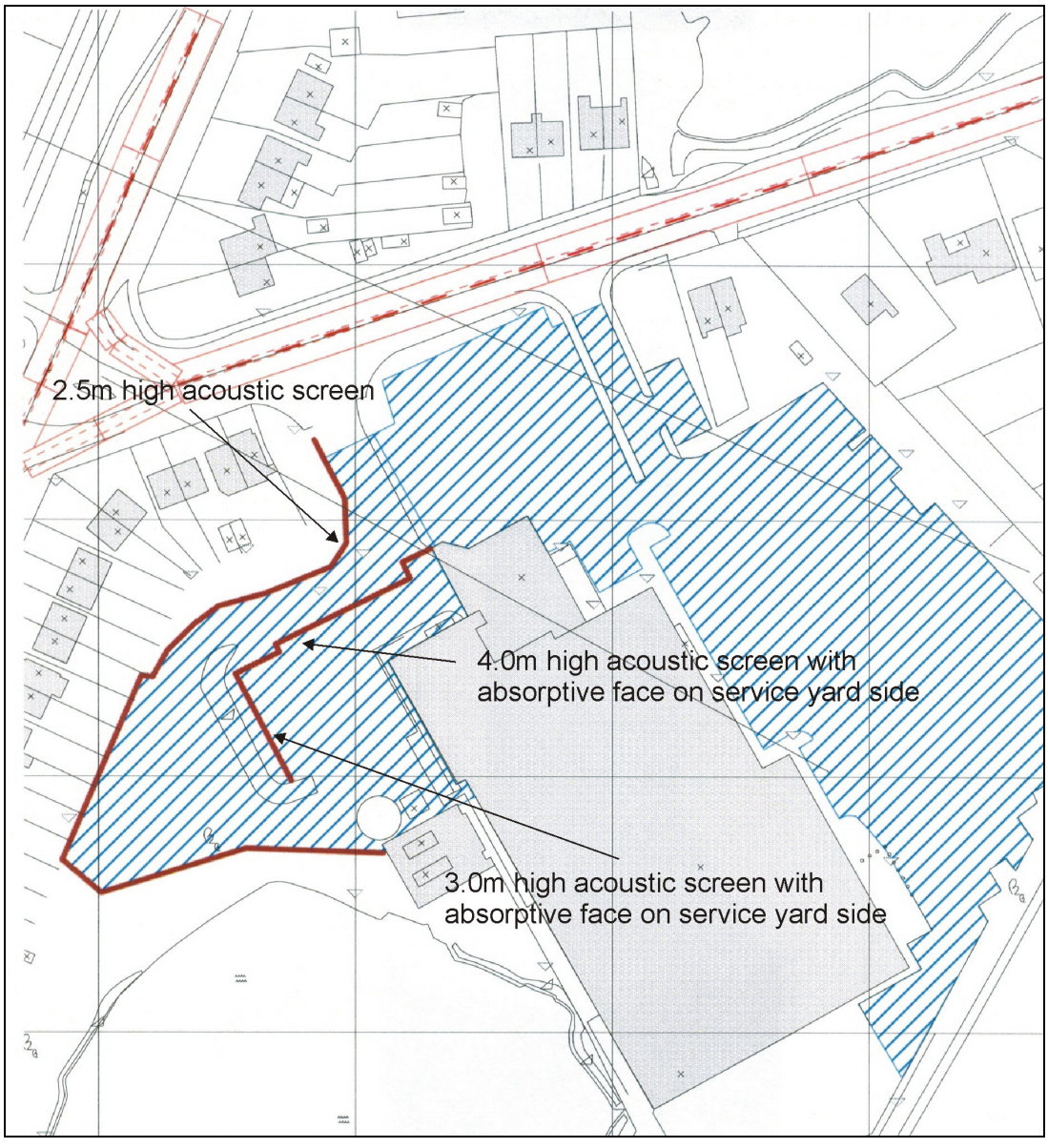


Figure 2: Plan View of Proposed Acoustic Screens (not to scale)

The screens would need to achieve a minimum superficial mass of 20 kgm^{-2} and it is suggested that they be constructed having regard to the Highways Agency Design Guides HA66/95 *"Environmental Barriers Technical Requirements"* All structural considerations are ultimately, however, the responsibility of others. Where screens to the service yard are proposed, a lining to the inner faces, i.e., those exposed to the noise sources would be required, the lining achieving a minimum mean absorption coefficient $\alpha = 0.75$.

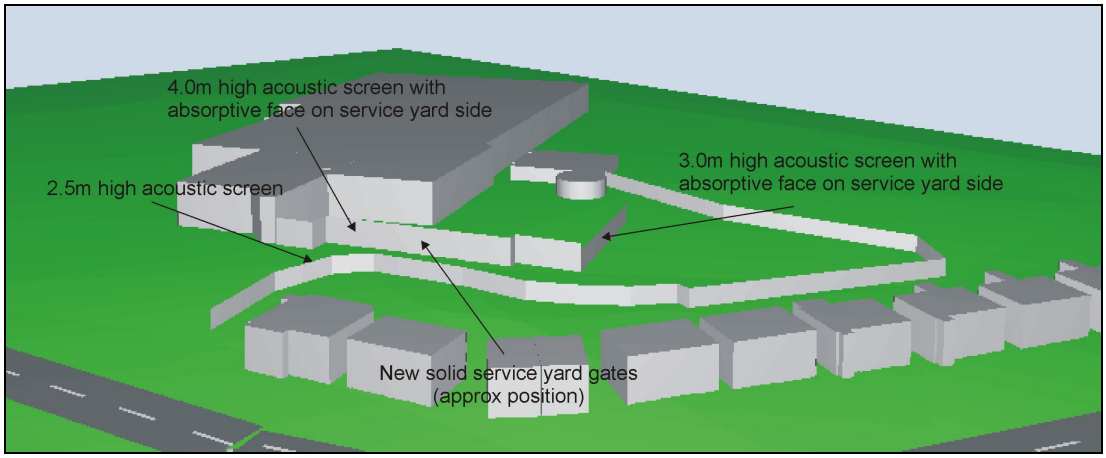


Figure 3: Aerial View of Proposed Acoustic Screens (not to scale)

8.2 Predicted Noise Levels (with mitigation)

Predicted facade noise levels, assuming provision of the mitigation measures set out above, are given in Table 6. The noise reduction compared with the unmitigated case is also given for the receivers in question.

Table 6: Predicted $L_{Aeq,1h}$ Noise Levels due to Servicing Activity with Mitigation

Receiver	Elevation	Floor	Predicted $L_{Aeq,1h}$ Noise Level		Noise Reduction
			Mitigated	Unmitigated	
8 to 10 Barwell Lane	Rear	Ground	40 dB	53 dB	13 dB
		First	42 dB	54 dB	12 dB
4 to 6 Barwell Lane	Rear	Ground	38 dB	52 dB	14 dB
		First	41 dB	53 dB	12 dB
120 Ashby Road	Rear	Ground	39 dB	50 dB	14 dB
		First	42 dB	51 dB	9 dB
116 to 118 Ashby Road	Rear	Ground	39 dB	45 dB	12 dB
		First	42 dB	50 dB	8 dB
112 to 114 Ashby Road	Rear	Ground	39 dB	46 dB	7 dB
		First	42 dB	50 dB	8 dB
108 to 110 Ashby Road	Rear	Ground	38 dB	45 dB	7 dB
		First	42 dB	49 dB	7 dB
104 to 106 Ashby Road	Rear	Ground	36 dB	42 dB	6 dB
		First	42 dB	46 dB	4 dB
100 to 102 Ashby Road	Rear	Ground	38 dB	40 dB	2 dB
		First	42 dB	44 dB	2 dB

8.2 Evaluation of Servicing Noise (with mitigation)

On the basis of the predicted servicing noise levels set out in Table 6, a revised BS 4142:1997 assessment has been carried out to determine the likelihood of complaint at the most affected dwelling. The following data result:

Table 7: BS 4142:1997 Assessment
8 to 10 Barwell Lane, First Floor, Rear Elevation

Results		Relevant clause	Commentary
Predicted noise level	$L_{Aeq,60min}$ = 42 dB	6.3.5	*Unloading of HGV and service yard activity.*
Lowest Background level (Table 2, Façade corrected)	$L_{A90,10min}$ = 45 dB	7.3	*Background measured in the absence of servicing*
Assessment to be made during the day time thus the reference time period is 60 minutes			
Specific noise level	$L_{Aeq,60min}$ = 42 dB	6.3	
Acoustic feature correction	+5 dB	8.2	*The noise contains distinct impulses*
Rating level	(42+5) dB = 47 dB	8.3	
Background level	$L_{A90,10min}$ = 45 dB		
Excess of rating over background level	**(47-45) dB = 2 dB**	9	
Assessment falls below *"marginal significance"*			

Examination of Table 7 indicates a situation that falls **below** *"marginal significance"* when assessing servicing noise in accordance with BS 4142:1997.

It should be noted that the specific noise level referred to in Table 7 is applicable to a first floor level window as this quantifies the "worst case". However, as the application seeks permission for deliveries from 08:00 hours onwards (daytime hours), an assessment at ground floor level windows would be applicable. In this case, the excess of the rating over background at the most affected receiver would be 2 dB lower than that given in Table 7, i.e., 0 dB, which would fall well below marginal significance according to BS 4142:1997.

An alternative approach when assessing any potential impacts associated with the servicing of the store is to compare the predicted activity noise levels with the existing underlying ambient data. As noted above, the worst-case predicted continuous noise level with mitigation is 42 dB $L_{Aeq,60min}$ at the façade of the most affected receiver. The lowest existing ambient noise level in this location is 46 dB $L_{Aeq,T}$, equivalent to 48 dB (45.5 dB + 2.5 dB) at façade[4] and it therefore follows that servicing activity noise would increase the lowest existing ambient level by 1 dB, a noise change that would be deemed insignificant according to Table 1. It therefore follows that no appreciable loss of residential amenity should occur.

[4] The serving noise levels set out above relate to a position 1m from facade and therefore include facade reflection effects. The measured ambient and background noise levels are quasi free-field data and to allow a like-for-like comparison with the predicted servicing noise levels, a facade correction needs to be applied.

Examination of Table 6 shows that predicted servicing noise levels are easily compliant with the World Health Organisation guideline value for outdoor living areas and thus the foregoing sentiments regarding the maintenance of residential amenity are applicable.

A significant point that arises from Table 6 is that residents would enjoy a reduction in noise during the periods over which servicing of the store currently takes place. The average noise reduction according to the Table 7 data is 9 dB, would be deemed as *"half as loud"* according to the semantic scale given in Table 1.

9.0 Conclusions

Noise levels at the nearest residential dwellings have been considered in the context of a planning application seeking permission for Sunday deliveries to the Asda food store located at Barwell Lane, Hinckley.

A detailed appraisal carried out in accordance with relevant British Standard assessment methods and other benchmarks for assessment has indicated that Sunday morning deliveries can be accommodated over the period 08:00 hours to 17:00 hours provided that the mitigation scheme detailed herein is adopted. It is also reiterated that the mitigation scheme will afford benefits to local residents over the existing permitted servicing hours.

Appendix A: Drawings



Drawing Title:
ASDA, Barwell Lane, Hinckley LE10 1SS
Site Location and measurement positions

Scale:	Date:	Drawing No.:	Revision:
NTS	June 2008	1914/SK1	A

Paragon
Acoustic Consultants
ANC Member Company

Woodley House
65/73 Crockhamwell Road,
Woodley, Reading RG5 3JP
Tel: 0118 9448444

Appendix B: Noise Survey Data

File	Date and Time	Position	1/1 Octave Band Leq							
			63 Hz	125 Hz	250 Hz	500 Hz	1.0 k	2.0 k	4.0 k	8.0 k
080601_0001.NBF	(2008/06/01 07:37:08.00)	MP1	61.3	56.0	44.2	40.0	40.8	36.5	33.1	25.7
080601_0003.NBF	(2008/06/01 07:51:43.00)	MP2	57.9	53.4	52.3	45.7	38.7	35.8	41.2	38.1
080601_0004.NBF	(2008/06/01 08:20:56.00)	MP1	54.9	54.2	44.8	40.3	39.8	36.7	34.8	27.6
080601_0005.NBF	(2008/06/01 08:44:50.00)	MP2	51.5	47.5	43.0	38.7	38.0	39.4	45.0	35.1
080601_0006.NBF	(2008/06/01 09:18:47.00)	MP1	56.3	55.1	47.0	42.4	40.0	37.1	36.8	31.7
080601_0007.NBF	(2008/06/01 09:38:25.00)	MP2	59.5	53.5	49.4	45.8	45.0	44.5	46.4	40.3
080601_0008.NBF	(2008/06/01 10:11:50.00)	MP1	59.6	54.5	46.6	43.3	42.3	38.5	37.4	28.9
080601_0009.NBF	(2008/06/01 11:23:39.00)	MP1	61.2	52.7	44.7	41.6	41.4	38.1	35.7	24.8
080601_0010.NBF	(2008/06/01 12:09:16.00)	MP1	61.5	51.9	43.9	40.4	40.6	36.8	34.4	23.5

File	Date and Time	Position	1/1 Octave Band LFmax							
			63 Hz	125 Hz	250 Hz	500 Hz	1.0 k	2.0 k	4.0 k	8.0 k
080601_0001.NBF	(2008/06/01 07:37:08.00)	MP1	69.5	60.9	47.4	43.2	47.9	44.5	40.9	40.1
080601_0003.NBF	(2008/06/01 07:51:43.00)	MP2	67.3	60.9	63.4	57.4	48.2	50.0	56.0	53.4
080601_0004.NBF	(2008/06/01 08:20:56.00)	MP1	68.6	60.2	57.0	52.6	52.8	53.3	53.0	51.7
080601_0005.NBF	(2008/06/01 08:44:50.00)	MP2	64.7	52.9	48.2	46.9	48.5	56.7	65.9	57.4
080601_0006.NBF	(2008/06/01 09:18:47.00)	MP1	71.2	62.1	60.3	56.9	53.1	53.9	54.0	49.8
080601_0007.NBF	(2008/06/01 09:38:25.00)	MP2	72.8	65.8	60.5	57.9	55.6	56.5	65.8	61.7
080601_0008.NBF	(2008/06/01 10:11:50.00)	MP1	68.4	70.9	63.2	58.8	54.6	48.5	59.7	51.5
080601_0009.NBF	(2008/06/01 11:23:39.00)	MP1	70.9	65.0	54.9	52.1	48.1	51.1	53.2	46.8
080601_0010.NBF	(2008/06/01 12:09:16.00)	MP1	73.0	66.2	55.6	53.8	49.0	52.0	53.1	47.2

File	Date and Time	Position	1/1 Octave Band LF10%							
			63 Hz	125 Hz	250 Hz	500 Hz	1.0 k	2.0 k	4.0 k	8.0 k
080601_0001.NBF	(2008/06/01 07:37:08.00)	MP1	65.1	58.2	45.8	42.0	43.6	38.0	35.8	27.0
080601_0003.NBF	(2008/06/01 07:51:43.00)	MP2	61.3	56.1	57.1	50.2	42.5	39.5	45.6	42.8
080601_0004.NBF	(2008/06/01 08:20:56.00)	MP1	56.5	55.8	47.2	43.0	42.5	39.0	38.7	28.9
080601_0005.NBF	(2008/06/01 08:44:50.00)	MP2	53.7	48.7	44.4	41.3	41.6	42.3	47.7	36.6
080601_0006.NBF	(2008/06/01 09:18:47.00)	MP1	58.8	56.8	50.2	44.4	42.0	38.9	40.2	34.7
080601_0007.NBF	(2008/06/01 09:38:25.00)	MP2	63.2	56.2	52.8	49.5	48.7	47.9	50.3	44.0
080601_0008.NBF	(2008/06/01 10:11:50.00)	MP1	62.4	55.6	48.7	45.4	44.2	40.5	38.7	28.1
080601_0009.NBF	(2008/06/01 11:23:39.00)	MP1	63.7	54.0	46.1	42.7	42.7	40.0	38.3	25.7
080601_0010.NBF	(2008/06/01 12:09:16.00)	MP1	63.2	56.2	52.8	44.4	42.0	38.9	38.7	28.9

File	Date and Time	Position	1/1 Octave Band LF90%							
			63 Hz	125 Hz	250 Hz	500 Hz	1.0 k	2.0 k	4.0 k	8.0 k
080601_0001.NBF	(2008/06/01 07:37:08.00)	MP1	56.6	53.6	42.1	37.9	38.1	34.3	29.5	21.3
080601_0003.NBF	(2008/06/01 07:51:43.00)	MP2	50.6	48.9	41.0	35.4	32.0	28.9	32.5	21.6
080601_0004.NBF	(2008/06/01 08:20:56.00)	MP1	51.6	52.2	41.8	36.3	35.2	32.7	27.1	16.4
080601_0005.NBF	(2008/06/01 08:44:50.00)	MP2	46.5	46.1	41.4	35.7	33.1	31.9	34.2	24.5
080601_0006.NBF	(2008/06/01 09:18:47.00)	MP1	51.8	52.9	42.1	37.1	36.9	34.3	28.2	16.9
080601_0007.NBF	(2008/06/01 09:38:25.00)	MP2	49.9	49.8	44.6	39.5	37.6	37.0	35.2	23.5
080601_0008.NBF	(2008/06/01 10:11:50.00)	MP1	55.4	51.6	43.3	40.0	39.9	35.7	28.1	16.6
080601_0009.NBF	(2008/06/01 11:23:39.00)	MP1	57.0	50.5	42.5	39.7	39.6	35.4	28.0	15.8
080601_0010.NBF	(2008/06/01 12:09:16.00)	MP1	56.0	51.0	42.2	38.6	39.5	36.1	29.0	16.1