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Acoustic Consultancy Report

Noise Impact Assessment for Car Parking Activity Associated with Extended Store Trading Hours

Asda Garston

Client:	Asda Stores Ltd
Project:	Asda Store St Mary's Road Garston L19 1SJ
Our Ref:	10690
Revision:	0
Report Prepared By	N. Fowler M.I.O.A.
Date:	11th February 2014

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INDEX

1.0 EXECUTIVE SUMMARY

Introduction

Acoustic Consultancy Partnership Ltd were appointed to complete a noise impact assessment at the Asda Garston store for car parking activity associated with extended store trading hours, for periods outside of the current permitted hours.

The assessment considers car parking activity for extended store opening between 22.00hrs and 07.00hrs Monday to Saturday. Sunday trading is to remain unchanged between 10.00hrs and 16.00hrs.

We understand there are no proposed changes to delivery activity or times due to the increased trading hours.

Noise Impact Assessment and Conclusion

The change in $L_{Aeq,T}$ assessment due to car parking activity confirms a negligible impact for all periods considered at both receptor positions.

The predicted car parking activity L_{AFmax} noise levels would marginally exceed the BS8233:1999 and WHO L_{AFmax} guideline values for sleep disturbance but would be generally comfortably below the existing highest L_{AFmax} noise climate values affecting the nearest residential properties throughout the night time periods.

In overall terms, the assessment confirms the car parking activity noise levels at the most affected residential properties would be below the existing noise climate levels for all periods.

The requirements of the National Planning Policy Framework (NPPF) and Noise Policy Statement for England (NPSE) should also be considered. As detailed in Appendix D, these documents require Planning Authorities to support sustainable growth, whilst firstly avoiding noise from giving rise to significant adverse impacts on health and quality of life as a result of the new development and secondly aiming to mitigate and minimise adverse impacts. These documents require the avoidance of noise at or above the “significant observed adverse effect level” (SOAEL). We believe the negligible impact indicated for the 05.00 to midnight period falls below the LOAEL and SOAEL thresholds and would therefore comfortably achieve the first and second aims of these documents.

We therefore conclude that the proposed extended trading hours between 22.00hrs and 07.00hrs Monday to Saturday would be acceptable with negligible impact on the amenity of the residents.

2.0 Introduction

Acoustic Consultancy Partnership Ltd were appointed to complete a noise impact assessment at the Asda Garston store for car parking activity associated with extended store trading hours, for periods outside of the current permitted hours.

The assessment considers car parking activity for extended store opening between 22.00hrs and 07.00hrs Monday to Saturday. Sunday trading is to remain unchanged between 10.00hrs and 16.00hrs.

We understand there are no proposed changes to delivery activity or times due to the increased trading hours.

Environmental noise monitoring had been completed at the site between 22.00hrs on Thursday 25th April 2013 and 07.00hrs on Friday 26th April 2013. The measurements obtained have established the existing ambient noise climate applicable to the facade of the nearest dwellings.

Detailed calculations have been undertaken of the predicted car park activity noise levels, based on noise data previously obtained for vehicle and customer movements within a store car park environment.

The assessment has been carried out with reference to British Standards and other guidance as considered appropriate.

3.0 Site Layout and Nearest Noise Sensitive Receptors

The store is bordered by St Mary's Road to the north and the A561, Garston Way, to the south. Garston Way is a dual carriageway and is a busy through route. St Mary's Road is also a relatively busy through route with a notable proportion of single and double deck buses that operate late at night and from 05.00 hrs in the morning.

A 24hour petrol filling station is located adjacent to the Asda store, to the north west of the site.

The store car park is generally positioned on the northern side of the site, with an entrance/exit off St Mary's Road. The store entrance is on the northern corner of the store building facing into the main car park. .

The nearest and most affected residential properties are located in St Mary's Road, to the north east of the store car park The properties overlook the store car park and the entry/exit.

A site plan is provided at the end of this report in Appendix B.

4.0 Environmental Noise Monitoring

Environmental noise monitoring has been carried out for a weekday evening, night time and morning period, covering the hours outside the current permitted store opening times. The environmental noise monitoring was carried out on the northern side of St Mary's Road as indicated on the site plan in Appendix B.

This monitoring location was considered representative of the existing noise climate affecting the selected receptor positions for times when the car park was not in use.

The relevant results from the environmental noise monitoring are summarised in the following sections and given in full in Appendix A.

5.0 Permitted Store Trading Hours

We understand store trading hours are currently restricted to the following times.

- 07.00 to 22.00 hrs Monday to Saturday
- 10.00 to 16.00 hrs on Sunday

6.0 Proposed Store Trading Hours

This report considers extended store trading hours between 22.00hrs and 07.00hrs Monday to Saturday. Sunday trading is to remain unchanged between 10.00hrs and 16.00hrs.

7.0 Noise Impact Assessment Details and Noise Data

We have based our assessment on typical measured noise levels for a car arrival and departure within a store car park environment. The noise data includes the influence of car arrival, doors and boots being shut, customer trolley movement near the car, car reversing and pulling away on departure. The measured levels relate to a diesel engine car, to ensure a worst case assessment. The activity noise data used in our assessment is confirmed in Appendix C.

We have also included the influence of "car pass-by" noise as vehicles enter and leave the site via the car park access point. The individual noise data is again provided in Appendix C and relates to a diesel engine car passing at 10mph.

For clarity, we give below an overview of the calculation details we have adopted.

Car Parking Area Likely to be Used and Vehicle Numbers

Based on our previous involvement with store trading / car park activity noise assessments and car trip data provided by transport consultants on previous projects, we have based our assessment on the following details.

Vehicle and customer numbers are typically low during the night time period between 23.00 to 07.00 hrs. To ensure a worst case assessment at night, we adopt a 5 minute reference period for the predicted activity noise level and assume a vehicle arrival, departure and both associated "pass-bys" would occur within 5 minutes. This ensures relative short duration activity at night is given sufficient weight within the noise assessment.

For the evening (22.00 to 23.00 hrs), we have assumed 13 complete car movements would take place in an hour (13 arrivals, 13 departures and 26 pass-bys). This is based on 25% of the total car park spaces, and is considered a robust assumption for these periods based on figures provided by transport consultants for previous projects. For the daytime periods we adopt a 1 hour reference period for the predicted activity noise level.

Experience on previous projects also confirms customers will typically park close to the store entrance during the less busy periods. We have therefore adopted a position close to the store entrance for vehicle arrivals and departures, as confirmed on the site plan in Appendix B

Car Pass-by

The store car park does not operate a parking system and cars are allowed to move in any direction around the car park. The positions adopted for car pass-by noise calculations are indicated in the site plan in Appendix B and represent the closest point of the car entry and exit route to the receptor positions.

8.0 Receptor Positions

We have selected the following receptor positions.

Receptor Position RPA	The facade of the two and three storey terraced properties on the north side of St Mary's Road opposite the car park entry/exit route.
Receptor Position RPB	The facade of the first floor flats above retail units on the north side of St Mary's Road opposite the car park.

9.0 Noise Impact Assessment

We have carried out a noise impact assessment for the above receptor positions, based on the methodology and criteria contained in Appendix D.

Change in LAeq,T Noise Level

From the assessment methodologies given in Appendix D, we believe the change in $L_{Aeq,T}$ methodology to be the most appropriate for this activity. It has the advantage of comparing the activity noise level against the existing noise climate and includes the influence of existing noise sources in the vicinity of the site, including traffic on the surrounding road network. This methodology is widely adopted for this type of activity by acoustic consultants and Local Authorities throughout the UK and is considered a fair and robust assessment methodology for this type of activity

As detailed in section 7.0, we have calculated the activity noise level over a 5 minute period for night time (23.00 to 07.00 hrs) and 1hour period for day time (07.00 to 23.00 hrs).

For the existing noise climate we have taken the lowest $L_{Aeq(10min)}$ measurement from each 1hour period. This ensures the lowest existing noise climate values are considered and helps to exclude the influence of any unusual activity around the site.

The predicted car parking activity and pass-by noise levels are given below, together with the lowest existing $L_{Aeq(10min)}$ noise levels, the resultant increase and the corresponding impact.

Table 1 –Car Parking Activity Noise Levels and Corresponding Impact, Receptor Position RPA

Period			Predicted Car Parking Activity Noise Level, dB		Lowest Existing LAeq(10min), dB	Increase in LAeq,T dB	Impact
22:00	to	23:00	43.6	LAeq(1hr)	58.8	0.1	Negligible
23:00	to	00:00	43.3	LAeq(5min)	57.8	0.2	Negligible
00:00	to	01:00	43.3	LAeq(5min)	54.6	0.3	Negligible
01:00	to	02:00	43.3	LAeq(5min)	48.6	1.1	Negligible
02:00	to	03:00	43.3	LAeq(5min)	45.8	1.9	Negligible
03:00	to	04:00	43.3	LAeq(5min)	50.0	0.8	Negligible
04:00	to	05:00	43.3	LAeq(5min)	49.3	1.0	Negligible
05:00	to	06:00	43.3	LAeq(5min)	54.9	0.3	Negligible
06:00	to	07:00	43.3	LAeq(5min)	59.3	0.1	Negligible

Table 2 –Car Parking Activity Noise Levels and Corresponding Impact, Receptor Position RPB

Period			Predicted Car Parking Activity Noise Level, dB		Lowest Existing LAeq(10min), dB	Increase in LAeq,T dB	Impact
22:00	to	23:00	44.5	LAeq(1hr)	58.8	0.2	Negligible
23:00	to	00:00	44.2	LAeq(5min)	57.8	0.2	Negligible
00:00	to	01:00	44.2	LAeq(5min)	54.6	0.4	Negligible
01:00	to	02:00	44.2	LAeq(5min)	48.6	1.3	Negligible
02:00	to	03:00	44.2	LAeq(5min)	45.8	2.3	Negligible
03:00	to	04:00	44.2	LAeq(5min)	50.0	1.0	Negligible
04:00	to	05:00	44.2	LAeq(5min)	49.3	1.2	Negligible
05:00	to	06:00	44.2	LAeq(5min)	54.9	0.4	Negligible
06:00	to	07:00	44.2	LAeq(5min)	59.3	0.1	Negligible

BS8233:1999 and World Health Organisation LAFmax Criteria

Assessment of car parking activity against the night time BS8233:1999 and World Health Organisation (WHO) recommended L_{AFmax} internal criteria for sleep disturbance has also been completed. Whilst this is a relatively common criteria adopted for this type of assessment, it is also important to consider the existing L_{AFmax} noise climate as the guideline figures may already be regularly exceeded at some sites.

The highest predicted L_{AFmax} activity noise level is confirmed below and compared to the guidance criteria.

Table 3 – BS8233:1999 and World Health Organisation L_{AFmax} Assessment

Receptor Position	Period	Highest Predicted L_{AFmax} (Outside Bedroom)	BS8233 / WHO L_{AFmax} Criteria (Outside Bedroom)	Existing L_{AFmax} Noise Climate
RPA	23.00 to 07.00	61.5	60	Between mid 60's and low 80's
RPB	23.00 to 07.00	62.5	60	Between mid 60's and low 80's

10.0 Noise Impact Assessment Results

Change in LAeq,T Noise Level

The predicted increase in $L_{Aeq(T)}$ noise levels at the selected receptor positions falls into the negligible category for the extended trading hours considered.

BS8233:1999 and World Health Organisation LAFmax Criteria

The predicted highest L_{AFmax} activity noise level marginally exceeds the BS8233:1999 and WHO guideline value for sleep disturbance at night (23.00 to 07.00 hrs) at the selected receptor positions, but are generally comfortably below the existing highest L_{AFmax} noise climate values affecting the nearest residential properties throughout the night.

11.0 Conclusions

The change in $L_{Aeq,T}$ assessment due to car parking activity confirms a negligible impact for all periods considered at both receptor positions.

The predicted car parking activity L_{AFmax} noise levels would marginally exceed the BS8233:1999 and WHO L_{AFmax} guideline values for sleep disturbance but are generally comfortably below the existing highest L_{AFmax} noise climate range throughout the night.

The requirements of the National Planning Policy Framework (NPPF) and Noise Policy Statement for England (NPSE) should also be considered. As detailed in Appendix D, these documents require Planning Authorities to support sustainable growth, whilst firstly avoiding noise from giving rise to significant adverse impacts on health and quality of life as a result of the new development and secondly aiming to mitigate and minimise adverse impacts. These documents require the avoidance of noise at or above the "significant observed adverse effect level" (SOAEL). We believe the negligible impact indicated for the 05.00 to midnight falls below the LOAEL and SOAEL thresholds and would therefore comfortably achieves the first and second aims of these documents.

We therefore conclude that the proposed extended trading hours between 22.00hrs and 07.00hrs Monday to Saturday would be acceptable with negligible impact on the amenity of the residents.

APPENDIX A

Environmental Noise Monitoring

A1.0 Environmental Noise Monitoring Location

Environmental noise monitoring had been completed at the site between 22.00hrs on Thursday 25th April 2013 and 07.00hrs on Friday 26th April 2013 covering the hours outside the current permitted store opening times.

Environmental noise monitoring was carried out on the northern side of St Mary's Road as indicated on the site plan in Appendix B.

This monitoring location was considered representative of the existing noise climate affecting the selected receptor positions for times when the car park was not in use.

A2.0 Monitoring Equipment

The noise monitoring equipment comprised of a Svantek 957 type 1 real time analyser, serial number 21447, with a weatherproof microphone protection system.

The meter calibration was verified before and after the measurement period by a Svantek SV31 acoustic calibrator, serial number 24687. Any deviation was within an acceptable tolerance.

The meter and calibrator have current calibration certificates available upon request.

A3.0 Environmental Noise Survey Measurement Period and Weather Conditions

Measurements were completed between 22.00hrs on Thursday 25th April 2013 and 07.00hrs on Friday 26th April 2013.

The weather during the survey period was acceptable for environmental noise monitoring, with dry conditions and light winds.

A4.0 Noise Measurement Parameters

The survey established the prevailing L_{AFmax}, $L_{Aeq,T}$, L_{A10} and L_{A90} noise levels, measured using F time weighting, with a 10 minute reference time period.

A5.0 Monitoring Results and Observations

We believe the recorded environmental noise measurements are representative of the existing noise climate applicable to the facade of the nearest noise sensitive receptors.

During our time on site we noted the main noise source affecting the measurements was road traffic activity in the surrounding area.

Garston Way is a dual carriage way and a busy through route.

St Mary's way is also relatively busy with regular traffic movements. Of particular note were the number of buses that use this road. During our survey, buses continued to use this route until after 01.00 hrs and started again soon after 05.00 hrs. This has a direct influence on the existing noise climate affecting the nearest residential properties.

The environmental monitoring results are given in Table 3 below.

Table 4 –Environmental Monitoring Results

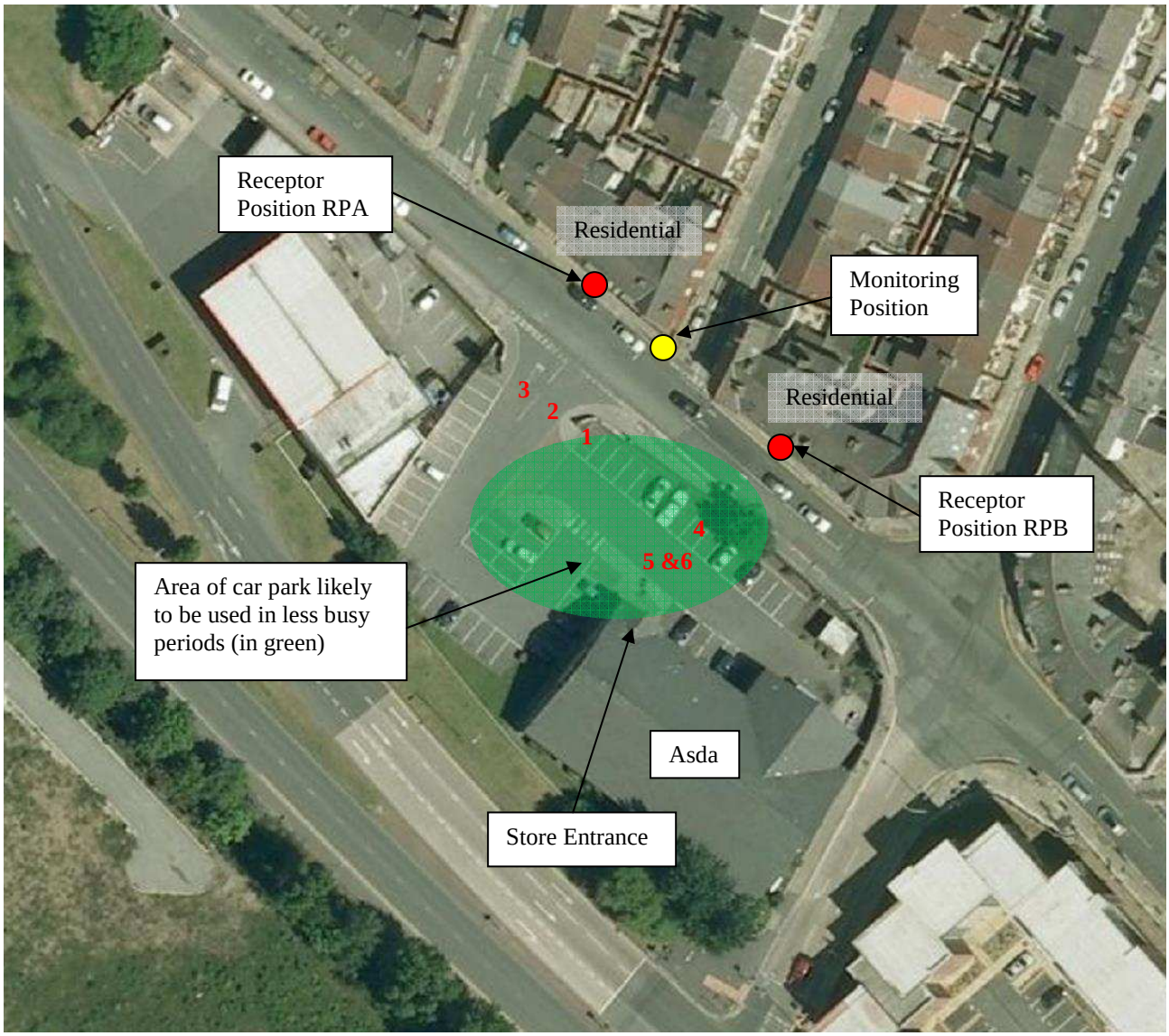
Date	Time			Measured Noise Level, dB			
				L_{AFmax}	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
Thursday 25.04.2013	22:00	to	22:10	77.4	63.1	66.6	52.2
	22:10	to	22:20	75.6	59.9	62.1	51.9
	22:20	to	22:30	78.1	60.0	62.0	48.8
	22:30	to	22:40	76.5	61.3	64.7	50.6
	22:40	to	22:50	82.5	62.2	62.8	52.1
	22:50	to	23:00	75.5	58.8	60.8	50.0
	23:00	to	23:10	75.0	59.2	61.7	48.7
	23:10	to	23:20	78.4	60.3	61.8	49.0
	23:20	to	23:30	75.4	58.0	59.4	45.3
	23:30	to	23:40	76.9	57.8	59.8	43.4
	23:40	to	23:50	74.2	59.2	62.5	48.5
	23:50	to	00:00	75.0	59.0	61.6	48.8

Table 4 –Environmental Monitoring Results

Date	Time			Measured Noise Level, dB			
				L_{AFmax}	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
Friday 26.04.2013	00:00	to	00:10	74.9	57.9	60.4	46.6
	00:10	to	00:20	75.8	57.6	59.7	44.8
	00:20	to	00:30	74.2	56.2	57.6	39.9
	00:30	to	00:40	75.3	57.3	59.6	39.0
	00:40	to	00:50	75.5	54.6	55.8	39.1
	00:50	to	01:00	78.8	57.5	59.2	41.3
	01:00	to	01:10	76.3	55.1	54.7	37.5
	01:10	to	01:20	76.2	54.9	56.2	38.9
	01:20	to	01:30	72.4	51.6	53.0	39.2
	01:30	to	01:40	77.7	56.6	58.5	38.3
	01:40	to	01:50	61.5	48.6	52.9	38.5
	01:50	to	02:00	76.8	57.0	57.8	42.4
	02:00	to	02:10	72.8	53.3	56.2	41.5
	02:10	to	02:20	74.6	52.8	53.5	38.1
	02:20	to	02:30	61.4	45.8	48.8	39.1
	02:30	to	02:40	75.9	54.5	56.0	39.6
	02:40	to	02:50	64.9	48.7	52.4	37.6
	02:50	to	03:00	74.6	53.9	55.5	38.6
	03:00	to	03:10	78.0	54.0	51.7	36.4
	03:10	to	03:20	80.4	55.6	54.5	36.7
	03:20	to	03:30	64.2	50.0	54.6	35.6
	03:30	to	03:40	71.6	52.8	56.3	36.5
	03:40	to	03:50	75.3	55.4	58.5	41.5
	03:50	to	04:00	79.4	55.1	55.5	37.3
	04:00	to	04:10	61.5	49.3	54.0	38.5
	04:10	to	04:20	76.9	55.0	56.7	39.5
	04:20	to	04:30	68.9	53.6	57.7	42.0
	04:30	to	04:40	63.6	52.9	56.8	42.0
	04:40	to	04:50	78.6	57.6	60.4	43.6
	04:50	to	05:00	72.7	56.3	59.5	41.9
	05:00	to	05:10	79.8	59.4	59.8	43.8
	05:10	to	05:20	69.4	54.9	58.2	46.6
	05:20	to	05:30	75.6	59.4	61.7	46.8
	05:30	to	05:40	73.8	58.7	61.4	50.0
	05:40	to	05:50	73.2	58.9	62.1	50.9
	05:50	to	06:00	76.8	59.9	62.8	53.2
	06:00	to	06:10	74.5	59.3	62.1	52.6
	06:10	to	06:20	80.3	61.1	62.7	53.1
	06:20	to	06:30	80.5	61.1	63.6	50.2
	06:30	to	06:40	82.0	63.8	65.8	55.6
	06:40	to	06:50	82.7	63.8	65.6	56.9
	06:50	to	07:00	79.3	64.9	67.2	61.2

APPENDIX B

Site Plan



1 Arrival and departure from car park space relating to RPA

2 Pass-by on entry into car park relating to RPA

3 Pass-by on exit from car park relating to RPA

4 Arrival and departure from car park space relating to RPB

5 Pass-by on entry into car park relating to RPB

6 Pass-by on exit from car park relating to RPB

APPENDIX C

Car Parking Activity Noise Levels

We have based our noise assessment on the following car parking activity noise data, obtained by measurement of typical car arrival and departure activity within a car park environment.

The data relates to diesel engine cars, and therefore provides a robust, worst case assessment. All measurements relate to a distance of 10m from the noise source.

Diesel Car Arrival (includes parking in bay and 2 doors shutting)

53.2 dB L_{Aeq} for 27 seconds
61.6 dB L_{AFmax}

For calculation purposes, this relates to:
67.5 dB L_{AE}
42.7 dB $L_{Aeq(5min)}$
3.19 dB $L_{Aeq(1hour)}$

Diesel Car Departure (includes trolley movement near car, boot and door shutting, reversing from bay and driving away)

55.6 dB L_{Aeq} for 38 seconds
66.6 dB L_{AFmax}

For calculation purposes, this relates to:
71.4 dB L_{AE}
46.6 dB $L_{Aeq(5min)}$
35.8 dB $L_{Aeq(1hour)}$

Combined Diesel Car Arrival and Departure (combination of the above)

54.8 dB L_{Aeq} for 1minute, 5 seconds
66.6 dB L_{AFmax}

For calculation purposes, this relates to:
72.9 dB L_{AE}
48.1 dB $L_{Aeq(5min)}$
37.3 dB $L_{Aeq(1hour)}$

Diesel Car Passby (10mph)

46.0 dB L_{Aeq} for 14 seconds

51.6 dB L_{AFmax}

For calculation purposes, this relates to:

57.5 dB L_{AE}

32.7 dB $L_{Aeq(5min)}$

21.9 dB $L_{Aeq(1hour)}$

Appendix D

Noise Impact Assessment Methodology

We give below a summary of the various British Standards and other published documents that provide guidance on noise impact assessment methodology and noise criteria that can be considered relevant to car parking activity noise.

National Planning Policy Framework (NPPF) 2012

The NPPF was published on 27th March 2012 and replaces the existing planning framework – which consisted of Planning Policy Guidance and Statements (PPGs and PPS).

The NPPF reflects previous planning guidance, and promotes sustainable economic development. As such the NPPF states that *"planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system".*

Whilst not providing any specific guidance on assessment methodology, this document confirms in section 123 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."* Furthermore they should aim to *"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".*

The aims of section 123 are to be read in conjunction with the Explanatory Note to the Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs).

Noise Policy Statement for England (NPSE) 2010

NPSE states the following vision "Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".

The first aim of NPSE is to "Avoid significant adverse impacts on health and quality of life"

The second aim is to "Mitigate and minimise adverse impacts on health and quality of life"

NPSE makes use of the key phrases "significant adverse" and "adverse" and provides the following guidance, based on established concepts from toxicology.

NOEL – No Observed Effect Level
This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level
This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level
This is the level above which significant adverse effects on health and quality of life occur.

For car parking activity, we believe the NOEL / LOAEL threshold is a change in $L_{Aeq,T}$ assessment of +3.0 dB and the LOAEL / SOAEL threshold is + 5 dB (below +3dB the impact would be classed as imperceptible / negligible, 3dB to 5dB would be perceptible / marginal and above 5 dB would be significant).

<u>BS 4142:1997 Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas</u>

This British Standard describes a method of determining the level of a noise of an industrial nature, together with procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity.

The external $L_{Aeq,T}$ noise level from "factories, or industrial premises, or fixed installations, or sources of an industrial nature in commercial premises" is measured or calculated. The $L_{A90,T}$ background noise level is also measured, without the specific noise source operating. The "rating level" of the noise source is established, including a +5dB correction if the noise source contains any "acoustic features" (distinguishable note, impulsive characteristic or irregular enough to attract attention). The rating level is then compared to the background noise level, and the likelihood of complaints is predicted as follows.

- A rating level of around +10 dB above the measured background level indicates that complaints are likely
- A rating level of around +5 dB above the measured background level is of marginal significance
- A rating level of 10 dB or more below the measured background noise level is a positive indication that complaints are unlikely.

BS4142:1997 is not suitable for assessing transient type noise sources such as from car parking activity. The use of $L_{A90,T}$ to characterise the underlying noise climate will naturally minimise the influence of many existing transient noise sources (such as existing passing traffic) from the assessment. It can therefore lead to an unrealistic assessment of car parking type noise sources, particularly when the site is in a busy area, or subjected to existing road noise.

Change in existing LAeq,T Noise levels

The degree of change in $L_{Aeq,T}$ noise levels can be used to assess the potential impact due to car parking activity noise. The predicted activity noise is added to the existing $L_{Aeq,T}$ noise climate and the degree of change in noise level assessed as follows.

Change in noise level, dBA	Response	Impact
Less than 3.0	Imperceptible	Negligible
3.0 to 4.9	Perceptible	Marginal
5.0 to 10.0	Up to a doubling of loudness	Significant
Greater than 10	Around a doubling of loudness	Severe

This is a commonly adopted assessment procedure for transient type noise sources, such as car parking activity. It has the advantage of using $L_{Aeq,T}$ to characterise the existing noise climate, including the influence of all existing transient noise sources, such as passing traffic. It also has the advantage of being site specific, with assessment against the prevailing external noise climate (instead of being based on absolute levels, as per BS8233:1999 or WHO).

We consider the change in $L_{Aeq,T}$ noise level to be the most appropriate assessment methodology for transient noise sources such as car parking.

BS8233:1999 Sound insulation and noise reduction for buildings – code of practice

This British Standard provides guidance on acoustic criteria appropriate for various types of internal spaces. The criteria provided for living rooms and bedrooms are given below.

Criteria	Typical Situation	Design range $L_{Aeq,T}$ dB	
		Good	Reasonable
Reasonable resting / sleeping conditions	Living rooms	30	40
	Bedrooms[a]	30	35
[a] For a reasonable standard in bedrooms at night, individual noise events (measured with F time weighting) should not normally exceed 45 dB L_{Amax}			

The above criteria are internal noise levels. We would allow a 15 dB reduction through a partially open window, in line with the assumptions made within WHO document, although in practice this can vary due to a number of site variables.

World Health Organisation – Guidelines for Community Noise

The World Health Organisation (WHO) Guidelines for Community Noise document provides guideline noise values for residential properties, as detailed below.

Specific environment	**Critical health effects(s)**	**L_{Aeq}, dB**	**Time base, hours**	**L_{AFmax}, dB**
Dwelling, Indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside Bedrooms	Sleep disturbance, night-time	30	8	45
Outside Bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

It can be seen that the WHO guideline values show close correlation with the recommended values contained within BS8233:1999.

Draft BS9142

Whilst this document is in draft version, it does provide guidance on generic assessment methodology for various types of noise activity. For a “new noise affecting existing noise sensitive location”, it recommends an assessment is made using absolute levels (as detailed in the various British Standards and other documents), comparison of the source level against the existing noise climate and the degree of change of the noise climate following introduction of the noise source.

This methodology corresponds closely with the guidance contained within the other standards and documents considered in this appendix.

Appendix E

Glossary of Terminology

$L_{Aeq,T}$

The $L_{Aeq,T}$ is defined as the equivalent continuous sound pressure level, over the reference time period "T". It can be considered as an average of the total sound energy, or the steady continuous level that has the same total energy as a fluctuating sound source.

$L_{A90,T}$

The $L_{A90,T}$ is a statistical parameter, defined as the sound pressure level exceeded for 90% of the measurement time period "T". It is used by BS4142:1997 to characterise the "background noise Level" and can be considered in simple terms as the noise level in the quieter spells eg between passing traffic.

$L_{A10,T}$

The $L_{A10,T}$ is a statistical parameter, defined as the sound pressure level exceeded for 10% of the measurement time period "T". It is commonly used to measure road traffic noise. In simple terms, it is a measurement of the noisier spells eg when traffic is passing.

L_{AFmax}

The L_{AFmax} is the maximum measured sound pressure level in a given measurement period.