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Lidl Food Store
Botwell Lane, Hayes
Middlesex

Environmental Noise Report

Reference: 5614/DO/pw **November 2013**

Lidl Food Store, Botwell Lane, Hayes
Environmental Noise Report

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Prepared By	**Checked By**
	
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1.0 INTRODUCTION

Lidl UK Limited appointed Acoustic Consultants Limited to undertake a noise survey and an assessment of noise from the plant and delivery operation and car park activities for the proposed Lidl Food Store, Botwell Lane, Hayes in support of a planning application.

This report is based on the information and layout contained on the Poole & Pattle Architects drawings entitled "Proposed Site Layout" with the drawing number 108 Revision E.

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above.

2.0 PROPOSED SCHEME

The Lidl Food Store is to be located on the former site of public swimming baths which have now been demolished leaving a vacant site. The site is on the corner of Botwell Lane and Central Avenue.

The proposal is for a new build Lidl food store on part of the site. All plant associated with the store will be located on the north elevation of the building within the delivery bay.

The most sensitive residential properties, in terms of plant and delivery noise are the dwellings along Holmbury Gardens to the North approximately 40 metres to the North of the proposed building (as indicated as R1 on Figure 1/5614). All other residential dwellings are either at a further distance away from the plant/delivery activities or shielded from the noise by the store.

The proposed opening hours of the store are between 08:00 and 22:00 hours. The proposed delivery hours are twenty four hours a day and include up to two articulated delivery vehicle per day.

3.0 ASSESSMENT CRITERIA

3.1 National Planning Policy Framework

The National Planning Policy Framework was published in March 2012 and replaces Planning Policy Guidance Document 24. This is a significantly shortened document. Section 11 entitled 'Conserving and enhancing the natural environment' addresses noise as a requirement of planning.

Paragraph 109 states:

"109. The planning system should contribute to and enhance the natural and local environment by:

- *preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability."*

Paragraph 123 states:

"123. 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 tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

The document does not prescribe any assessment methodology or criteria to assess the adverse affect of noise.

3.2 Noise Policy Statement for England

The NPPF refers to the Noise Policy Statement for England (NPSE). This was published in March 2010 by DEFRA and aims to provide clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion. It applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

The NPSE introduces the concept of "Significant Adverse" and "Adverse" impacts of noise. These are applied as follows:

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.

The NPSE does not provide any assessment criteria for the noted effect levels.

3.3 National Planning Practice Guidance, Noise

The National Planning Practice Guidance on noise referred to here is based on 23rd August 2013 updated as provided on the Planning Guidance Website.

It states that *"Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. In both cases, the potential noise impact needs to be addressed. Opportunities should also be taken, where possible, to achieve improvements to the acoustic environment"*

It provides generic guidance on how to determine the noise impact and what factors could be a concern.

It includes the option types to mitigate any adverse effects of noise stating that there are four broad types of mitigation. These are engineering, layout, using planning conditions or obligations and noise insulation.

3.4 British Standard 4142:1997

The British Standard 4142:1997 entitled "Method for rating industrial noise affecting mixed residential and industrial areas" provides an assessment method in relation to the likelihood of complaints. The principle is that of establishing the "difference" between the rating level (the specific investigated noise with a +5 decibel acoustic feature correction, if applicable) and the background noise level.

To obtain the “rating level” the British Standard 4142: 1997 states that a +5 decibel acoustic feature correction should be added to the specific noise level if the specific noise has any of the following characteristics:

- *The noise contains a distinguishable, discrete, continuous note (whine, hiss, screech, hum, etc.);*
- *The noise contains distinct impulses (bangs, clicks, clatters or thumps.);*
- *The noise is irregular enough to attract attention*.

In Section 9 of the Standard, under "Assessment Method", it states:

"The greater the difference, the greater the likelihood of complaints. A difference of around +10dB 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 decibels below the Background Noise Level, then this is a positive indication that complaints are unlikely."

According to the Standard, "a difference of around +5dB is of marginal significance" (Section 9) when assessed at locations external to façades of sensitive properties. We have used this criterion on numerous sites over a number of years and are not aware of any adverse reactions.

The Local Planning Authority applies a more stringent British Standard 4142:1997 assessment difference of -10 dB below the background noise level and where it is difficult to achieve this criteria the less onerous criteria of -5 dB can be applied upon agreement with the Local Authority. As such this is the criteria used in the assessment.

3.5 Delivery Noise

There is no specific planning guidance in relation to Delivery Noise. As such we have followed a common sense approach.

The main source of noise from delivery operation is the movement of the delivery vehicle. The character of this noise is similar to road traffic and not specifically of an industrial nature.

The number of delivery movements per day is negligible in comparison with traffic on the surrounding highway network although should be considered so as not to adversely affect the amenity of neighbouring residential properties.

This report outlines the delivery methodology and the proposed noise mitigation and control measures to reduce the impact on nearby receptors.

3.6 Car Park Activities

There is no specific planning guidance as such it is appropriate to use a common sense approach.

Generally acceptable levels are achieved if the equivalent noise level from the proposed car park activity are of the same order as the current equivalent noise levels experienced around the site.

4.0 NOISE MEASUREMENTS

4.1 Monitoring Equipment

Sound Pressure Levels were measured using a CEL 593 Sound Level Meter with half-inch condenser microphones using the "fast" setting. The equipment is checked annually using a Quality System meeting the requirements of British Standard EN ISO/IEC 17025:2005 and in accordance with British Standard EN 10012:2003 and traceable to the National Standards. This equipment was checked and calibrated as noted below and the certificates are available for inspection. The table below provides the equipment and calibration status:

Table 1: Monitoring Equipment

Equipment Description / Manufacturer / Type	Serial number	Date of calibration	Calibration Certification Number
Real Time Analyser, CEL, Type 593	0271040	09/09/13	K043915
Pre-Amplifier, CEL, Type 527	3/0221937	09/09/13	K043915
Microphone, CEL, Type 250	4951	09/09/13	K043915
Calibrator, CEL, Type 284/2	3/02716829	09/09/13	K043916

The measuring systems were checked for calibration before and after the tests and no significant drift was detected.

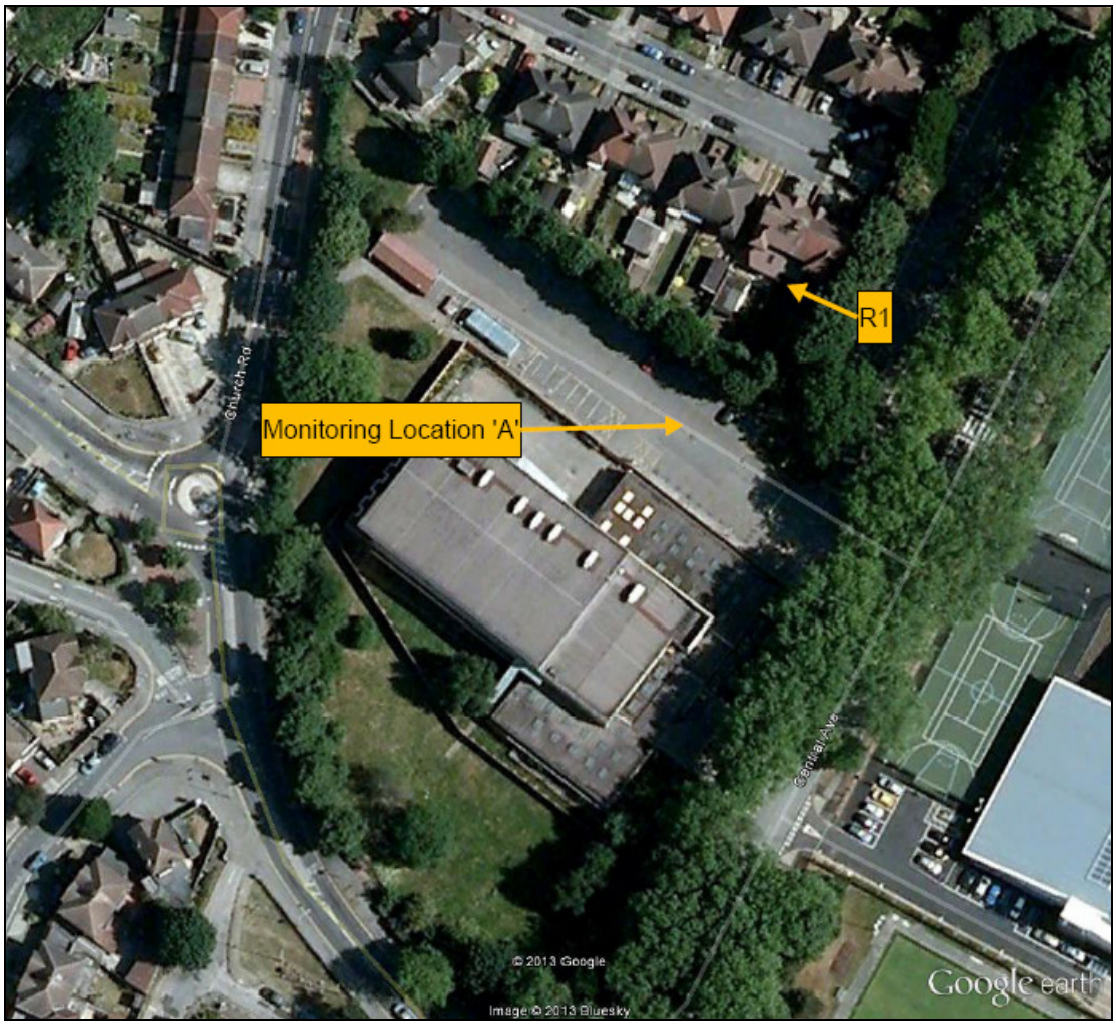
The monitoring was carried out in overcast conditions with a daytime air temperature of about 14 degrees Centigrade with little or no wind. These conditions are not expected to have a significant adverse effect on the measured levels. During the night time there were occasional rain showers, these have been omitted from the noise assessments.

4.2 Monitoring Procedure

An assessment to British Standard 4142 requires that the "Background Noise Level" typical for the area, be established. The plant operates 24-hours a day according to demand. As such, a long term noise monitoring exercise was carried out to determine the baseline noise conditions.

Noise monitoring was undertaken for a twenty four hour period commencing at 10:30 hours on 31st October 2013. The monitoring location was at ground level in a free field position to the North of the site. The monitoring location was partially shielded from the main roads around the site by the site hoarding and considered representative of the sensitive receivers in the vicinity.

Figure 1: Monitoring Location & Noise Sensitive Receiver Locations



The measured baseline noise levels were determined by road traffic on the surrounding highway network and aircraft.

4.3 Measured Data

The measured data consists of the Equivalent Noise Level ($L_{Aeq\ (5minute)}$), maximum noise level ($L_{Amax(fast)}$) and Background Noise Level ($L_{A90\ (5minute)}$) in dB (A). The results are provided in Appendix 1/5614 for 5-minute measurement time intervals and are free field levels.

The lowest measured daytime background noise level (between 07:00 and 23:00 hours) is 45 dB $L_{A90(1\ hour)}$ (free field level) and the night-time background noise level is 39 dB $L_{A90(5\ minutes)}$ (free field level).

It is appropriate to assess the impact over the car park operation over a one hour period. Appendix 2/5614 provides the one hour equivalent noise level ($L_{Aeq(1hr)}$) over the daytime period. The proposed car park hours are between 07:00 hours and 23:00 hours. From the measurement data the range of one hour equivalent noise level during this period is 48-51 dB $L_{Aeq\ (1\ hour)}$ (free field level).

5.0 CONDENSER PLANT NOISE EMISSION

5.1 Refrigeration Plant

The refrigeration plant is located at a height of 3.5 metres above the ground within the delivery bay on the north elevation of the store. The refrigeration plant operates on a 24-hour basis according to demand. It thus operates during the most sensitive time, the night-time.

From the information provided by Lidl, the proposed chiller unit is a LU-VE Contardo condenser type EAV6R 7665 6VENT (2X3). From the data sheet supplied by Lidl, this unit has a noise emission level of 24 $L_{Aeq\ (short\ term)}$ at 10 metres in a free-hemispherical field. Any alternative plant should have an equal or lower noise emission level (dB) in a hemispherical free-field.

5.2 Air Conditioning Condenser Plant

There are six condenser units which will serve the air conditioning plant. Four of the air conditioning condenser units are located on the north east elevation and two are located on the North West elevation of the store at a height of 3.5 metres. The condenser units serve the Sales area, Stores area, and Manager/Staff areas and as such operate one hour before the stores opening hours until close i.e. 07:00 to 23:00 hours.

The following table provides the manufacturer, model number, and sound pressure level of each unit at a distance of 1 metre in a free-hemispherical field.

Table 2: A/C Plant

Manufacturer	Model	Quantity	Facade	Individual Unit Sound Pressure Level
Mitsubishi	FDC200VS	2	North East	57 dB(A)
Mitsubishi	FDC200VS	2	North West	57 dB(A)
Mitsubishi	SRC35ZJ-S	2	North West	51 dB(A)

Any alternative plant should have an equal or lower noise emission level (dB(A)) in a hemispherical free-field.

5.3 Bakery Freezer Plant

It is proposed to install one condenser unit serving the bakery area. The proposed plant will be located to the corner of the northeast and southeast elevations of the store in a louvered enclosure.

The proposed unit is the Rivacold Deutschland condenser unit and will operate 24 hours a day according to demand.

From the information supplied by Lidl UK, this unit has a noise emission level of 41 dB $L_{Aeq\ (short\ term)}$ at 10 metre in a free-hemispherical field.

Any alternative plant should have an equal or lower noise emission level (dB) in a hemispherical free-field.

5.4 Predicted Noise Level

Plant noise levels at the nearby residential properties have been predicted based on the plant noise levels and distance correction of a point source. The noise sources will include reflections off the northern wall of the building which will increase the noise emission level.

The following tables provide the corrections to the stated noise levels to determine plant noise levels at the nearby residential properties.

Table 3: Daytime predicted noise levels

Unit	Stated Noise Level	Distance Correction	Correction due to reflection	Predicted Level at R1
EAV6R 7665 6VENT	24 dB(A) @ 10m	-13 dB	+3 dB	14 dB(A)
FDC200VS	57 dB(A) @ 1m	-32 dB	+ 3 dB	28 dB(A)
FDC200VS	57 dB(A) @ 1m	-32 dB	+ 3 dB	28 dB(A)
FDC200VS	57 dB(A) @ 1m	-39 dB	+ 3 dB	21 dB(A)
FDC200VS	57 dB(A) @ 1m	-39 dB	+ 3 dB	21 dB(A)
SRC35ZJ	51 dB(A) @ 1m	-32 dB	+ 3 dB	22 dB(A)
SRC35ZJ	51 dB(A) @ 1m	-32 dB	+ 3 dB	22 dB(A)
Rivacold Deutschland	41 dB(A) @ 10m	-13 dB	+ 3 dB	31 dB(A)
Cumulative Noise Level				35 dB(A)

Table 4: Night time predicted noise levels

Unit	Stated Noise Level	Distance Correction	Correction due to reflection	Predicted Level at R1
EAV6R 7665 6VENT	24 dB(A) @ 10m	-13 dB	+3 dB	14 dB(A)
Rivacold Deutschland	41 dB(A) @ 10m	-13 dB	+ 3 dB	31 dB(A)
Cumulative Noise Level				31 dB(A)

5.5 Plant Noise Assessment

The refrigeration and bakery freezer plant will operate on a 24-hour basis according to demand. The air conditioning plant will operate during the store opening/delivery hours only.

A daytime and night-time noise British Standard 4142 assessment has been undertaken at the sensitive receivers around the site. A daytime background noise level of 45 dB $L_{A90(1\ hour)}$ (free field level) and the night-time background noise level is 39 dB $L_{A90(5\ minutes)}$ (free field level has been selected for the assessment.

On this basis the British Standard 4142:1997 assessment is as follows:

Table 5: British Standard 4142 Assessment at R1 and R2

	Daytime Assessment	Night-time Assessment	**BS Clause**
Background Level, $L_{A90\ 5minutes}$	45 dB	39 dB	7.3
Specific Noise Level, $L_{Aeq\ 5minutes}$	35 dB	31 dB	6.3
Acoustic Feature Correction	+0 dB	+0 dB	
Rating Level	35 dB	31 dB	8.3
Excess of rating over background level	-10 dB	-8 dB	9.0

It is our opinion that an Acoustic Feature Correction is not applicable as the predicted plant noise level is considerably lower than the existing Background noise level and therefore will be barely audible above the existing noise climate.

This means that the condenser noise level will result in a British Standard 4142 assessment "difference" of between -10 and -8 decibel at the most noise sensitive receiver R1.

According to the British Standard "If the rating level is more than 10 decibels below the Background Noise Level, then this is a positive indication that complaints are unlikely."

In environmental noise terms (affecting the residential premises in the vicinity) the proposals are considered acceptable in terms of noise emission to the dwellings in the vicinity.

6.0 DELIVERY OPERATION NOISE EMISSION

We understand that the deliveries are contained in no more than two vehicles per day. The vehicle includes a refrigerated section with condensing unit. This can normally be turned off during the delivery operation. The vehicle arrives on site and reverses up to the enclosed loading bay dock. The engine is then turned off and the goods are moved internally from the trailer into the store. The goods are mostly on pallets and an electric pallet truck is used. The operation takes place internally and the vehicle departs after about one hour.

The delivery vehicles will enter the site and drive south into the car park. The vehicle will then reverse turning parallel to the north east façade of the building down the sunken loading bay entrance.

When the vehicle enters the site it is proposed that all reversing beepers are turned off.

For a large part of the reversing operation the trailer will create a barrier between the noise generating engine of the lorry and the noise sensitive residential properties.

It is proposed to install a 1.8 metre acoustic fence along the length of the delivery bay to reduce noise from the lorry engine and brakes.

It is advised that consideration is made to providing adequate lighting designed to specifically assist the driver of the vehicle when reversing into the loading bay. This will reduce the need for additional manoeuvring.

The delivery bay includes a curtain that will enclose the rear of the delivery trailer reducing the breakout of sound and light.

Once the delivery is complete the orientation of the loading bay is such that the vehicle can directly exit the site without the need for significant manoeuvring thus reducing the time and noise generated on site.

7.0 CAR PARK ACTIVITIES

The proposed car park opening hours are 07:00 hours to 23:00 hours, one hour either side of the store opening hours.

Generally acceptable levels are achieved if the equivalent noise level from the proposed car park activity are of the same order as the current equivalent noise levels experienced around the site, or the increase is not more than 3 decibels.

The nearest noise sensitive properties to car park activity are residential dwellings to the North (R1).

The car park is located to the East and South of the proposed store, the entrance to the store is on the South East corner and we would expect this to be the busiest area of the car park.

From our experience and noise measurements recorded over a number of years of car parking in a number of different car parks, we have established that the equivalent noise levels due to car park activity at the boundary of car park sites are about 45 to 50 $L_{Aeq(1\ hour)}$ decibels. This includes parking, manoeuvring and closing doors and does not appear to be very sensitive to the number of movements.

The residential dwellings to the North of the site (R1) are approximately 50 metres from the closest car parking space with the majority of spaces further away.

Due to the increased distance from the site boundary the equivalent noise level due to car park activity is expected to be reduced by about 10-15 decibels resulting in car

park noise levels of approximately 35 $L_{Aeq(1\ hour)}$ decibels (free field) at the residential properties.

The predicted car park noise level at the noise sensitive residential properties is considerably lower than the existing equivalent noise levels on site during the proposed hours of use.

As such car park noise is not expected to result in an increase in the equivalent noise level at the façade of the residential properties and is considered acceptable.

8.0 LIMITATIONS

The report limits itself to addressing solely on the noise control and acoustic aspects as included in this report. We provide advice only in relation to noise and acoustics.

The report has been prepared in good faith, with all reasonable skill and care, based on information provided or available at the time of its preparation and within the scope of work agreement with the Client. We disclaim any responsibility to the Client and others in respect of any matters outside the scope of the above.

The report is provided for the sole use of the named Client and is confidential to them and their professional advisors. No responsibility is accepted to other parties.

It should be noted that noise predictions are based on the current information as we understand it and on the performances noted in this report. Any modification to these parameters can alter the predicted level. All predictions are in any event subject to a degree of tolerance of normally plus or minus three decibels. If this tolerance is not acceptable, then it would be necessary to consider further measures.

9.0 SUMMARY AND CONCLUSIONS

Lidl UK Limited appointed Acoustic Consultants Limited to undertake a noise survey and an assessment of noise from the plant, delivery operation and car park activities for the proposed Lidl Food Store, Botwell Lane, Hayes in support of a planning application.

A noise survey was undertaken to determine the existing baseline noise climate. In addition a noise modelling exercise has been undertaken to determine the plant noise levels at the façade of the nearby noise sensitive receivers.

Plant noise levels at the nearest noise sensitive residential properties have been predicted. The predicted noise levels have been used in a British Standard 4142:1997 assessment; the assessment “difference” is -10 to -8 decibels. According to the

British Standard “If the rating level is more than 10 decibels below the Background Noise Level, then this is a positive indication that complaints are unlikely."

The main source of noise from delivery operation is the movement of the delivery vehicle. The character of this noise is similar to road traffic and not specifically of an industrial nature. Advice is provided to minimise noise emission from delivery activities. This includes the use of an acoustic barrier along the edge of the loading bay ramp.

Noise from car park activities has also been considered the predicted noise levels due to car park activity is not expected to result in an increase in the equivalent noise level at the façade of the residential properties and is considered acceptable.

In environmental noise terms (affecting the residential premises in the vicinity) the proposed plant, delivery operation and car park activities is considered acceptable in terms of noise emission to the dwellings in the vicinity.

Appendix 1/5614 Measured Noise Levels at Monitoring Location 'A'

Date and Time	$L_{Aeq(5\ minutes)}$ dB	$L_{Amax(fast)}$ dB	$L_{A10(5\ minutes)}$ dB	$L_{A90(5\ minutes)}$ dB
31/10/2013 10:30	55.6	74.4	58	45
31/10/2013 10:35	54.5	72.7	58	45
31/10/2013 10:40	45.9	54.7	47	44
31/10/2013 10:45	46.3	54.8	48	44
31/10/2013 10:50	46.8	61	48	45
31/10/2013 10:55	46.6	60.1	48	45
31/10/2013 11:00	47.5	55.9	50	44
31/10/2013 11:05	47.4	57	50	45
31/10/2013 11:10	47.6	58.5	49	45
31/10/2013 11:15	49.2	59.9	51	47
31/10/2013 11:20	47.3	58.1	49	45
31/10/2013 11:25	46.9	58.2	48	45
31/10/2013 11:30	47.4	59.8	49	45
31/10/2013 11:35	46.7	54.9	48	45
31/10/2013 11:40	47.2	56.5	49	45
31/10/2013 11:45	48.2	55.2	50	45
31/10/2013 11:50	47	54.3	49	45
31/10/2013 11:55	48.7	59	51	46
31/10/2013 12:00	54.5	67.9	58	47
31/10/2013 12:05	49.3	63.2	52	46
31/10/2013 12:10	48.3	59.7	50	46
31/10/2013 12:15	49.6	57.5	52	47
31/10/2013 12:20	47.6	56.5	49	46
31/10/2013 12:25	47.4	55.3	49	46
31/10/2013 12:30	48.2	56.7	50	46
31/10/2013 12:35	47.2	57	49	45
31/10/2013 12:40	49.4	75.1	50	46
31/10/2013 12:45	48.4	72.1	49	46
31/10/2013 12:50	47.6	56.3	49	46
31/10/2013 12:55	47.9	58.5	49	46
31/10/2013 13:00	50	74.3	51	46
31/10/2013 13:05	49.1	59.4	51	47
31/10/2013 13:10	49.2	61.9	51	46
31/10/2013 13:15	48.6	57.5	50	47
31/10/2013 13:20	48.7	61.4	50	47
31/10/2013 13:25	48.4	60.4	50	46
31/10/2013 13:30	49.2	61.8	51	46
31/10/2013 13:35	55.8	80.5	52	47
31/10/2013 13:40	54.7	79	52	47
31/10/2013 13:45	49	61.8	51	47
31/10/2013 13:50	48.3	59.9	50	46

Date and Time	$L_{Aeq(5\ minutes)}$ dB	$L_{Amax(fast)}$ dB	$L_{A10(5\ minutes)}$ dB	$L_{A90(5\ minutes)}$ dB
31/10/2013 13:55	49.8	73	51	47
31/10/2013 14:00	51	74.9	52	47
31/10/2013 14:05	51.5	75.2	51	46
31/10/2013 14:10	53.7	79.7	54	47
31/10/2013 14:15	52.2	75.6	53	47
31/10/2013 14:20	49.4	73.9	50	47
31/10/2013 14:25	51	76.8	51	48
31/10/2013 14:30	54	79.1	54	47
31/10/2013 14:35	50.7	72.4	52	48
31/10/2013 14:40	51.1	73.2	52	48
31/10/2013 14:45	50	65.2	51	47
31/10/2013 14:50	51.5	75	53	47
31/10/2013 14:55	50	72.1	51	48
31/10/2013 15:00	53.2	80.7	51	47
31/10/2013 15:05	48.6	72.8	49	47
31/10/2013 15:10	49.5	56.6	51	48
31/10/2013 15:15	49.8	61.3	52	47
31/10/2013 15:20	53.3	77.5	51	47
31/10/2013 15:25	56.7	79.1	54	48
31/10/2013 15:30	50.6	72.9	52	48
31/10/2013 15:35	54.6	80.1	52	48
31/10/2013 15:40	50.1	71.8	51	48
31/10/2013 15:45	51.9	78	52	48
31/10/2013 15:50	50.5	72.6	51	47
31/10/2013 15:55	50.4	73.2	52	48
31/10/2013 16:00	51.1	75.2	51	47
31/10/2013 16:05	55.8	78.9	53	48
31/10/2013 16:10	51.2	76.8	53	48
31/10/2013 16:15	52.7	77.1	52	48
31/10/2013 16:20	51.2	60.1	54	48
31/10/2013 16:25	50	59.4	52	47
31/10/2013 16:30	52.3	76	53	48
31/10/2013 16:35	54.2	80.4	54	48
31/10/2013 16:40	50.6	61.7	52	48
31/10/2013 16:45	49.7	60.7	51	48
31/10/2013 16:50	52.6	80.2	52	47
31/10/2013 16:55	52.2	77.2	53	48
31/10/2013 17:00	53	77.4	53	48
31/10/2013 17:05	52.3	79	52	48
31/10/2013 17:10	56	81.3	55	49
31/10/2013 17:15	50.5	59.7	52	48
31/10/2013 17:20	50.8	61.8	53	48
31/10/2013 17:25	51.2	61.2	54	48
31/10/2013 17:30	50.6	63.5	52	49

Date and Time	$L_{Aeq(5\ minutes)}$ dB	$L_{Amax(fast)}$ dB	$L_{A10(5\ minutes)}$ dB	$L_{A90(5\ minutes)}$ dB
31/10/2013 17:35	51.2	61	54	48
31/10/2013 17:40	51.7	71.1	54	49
31/10/2013 17:45	51.1	61.8	53	48
31/10/2013 17:50	51.7	73	54	48
31/10/2013 17:55	53.7	75.8	55	49
31/10/2013 18:00	54.3	75.9	55	49
31/10/2013 18:05	50.1	61	52	48
31/10/2013 18:10	51.8	74.8	53	48
31/10/2013 18:15	54.6	77.2	55	48
31/10/2013 18:20	54.8	79.7	54	49
31/10/2013 18:25	52.5	78.9	53	48
31/10/2013 18:30	50.7	72.2	52	48
31/10/2013 18:35	51.7	72.1	54	48
31/10/2013 18:40	52.4	72.6	54	48
31/10/2013 18:45	51.8	68.5	54	48
31/10/2013 18:50	52.5	76.4	53	48
31/10/2013 18:55	50.8	71.7	53	48
31/10/2013 19:00	54.2	78.5	54	48
31/10/2013 19:05	51.8	72.3	55	48
31/10/2013 19:10	52.3	78.8	55	47
31/10/2013 19:15	50.6	64	53	48
31/10/2013 19:20	50.7	66	53	48
31/10/2013 19:25	51	78.4	51	47
31/10/2013 19:30	51.2	61.4	54	48
31/10/2013 19:35	53.1	76.4	54	49
31/10/2013 19:40	49.8	60.2	52	47
31/10/2013 19:45	50.8	72.1	53	48
31/10/2013 19:50	56.3	80.2	54	48
31/10/2013 19:55	51.1	78.3	51	48
31/10/2013 20:00	51.8	75.1	53	48
31/10/2013 20:05	55	79.4	55	48
31/10/2013 20:10	54.9	81.7	53	48
31/10/2013 20:15	53.9	79	54	47
31/10/2013 20:20	53.1	79.1	55	48
31/10/2013 20:25	50.2	62.1	52	48
31/10/2013 20:30	51	76.9	51	47
31/10/2013 20:35	52	76.5	53	48
31/10/2013 20:40	51.6	70.8	53	49
31/10/2013 20:45	52	77.1	53	48
31/10/2013 20:50	52.6	79.1	53	48
31/10/2013 20:55	57.4	80.4	55	47
31/10/2013 21:00	55.1	79.4	57	48
31/10/2013 21:05	52.1	68.8	55	47
31/10/2013 21:10	51.5	72.7	54	47

Date and Time	$L_{Aeq(5\ minutes)}$ dB	$L_{Amax(fast)}$ dB	$L_{A10(5\ minutes)}$ dB	$L_{A90(5\ minutes)}$ dB
31/10/2013 21:15	53.6	71.3	56	47
31/10/2013 21:20	54	72.4	57	47
31/10/2013 21:25	54	72.1	57	48
31/10/2013 21:30	52.3	75.3	55	48
31/10/2013 21:35	50.9	65.7	54	47
31/10/2013 21:40	50.3	72.6	51	47
31/10/2013 21:45	53.4	72.3	56	47
31/10/2013 21:50	51.7	65.8	55	48
31/10/2013 21:55	50.3	60.4	53	47
31/10/2013 22:00	51.5	73.5	53	47
31/10/2013 22:05	50	66.5	52	47
31/10/2013 22:10	50.5	72.4	53	46
31/10/2013 22:15	52.4	79	53	47
31/10/2013 22:20	47.9	57.3	50	46
31/10/2013 22:25	50.7	69.3	52	46
31/10/2013 22:30	48.8	62.2	51	46
31/10/2013 22:35	52.3	64.7	56	47
31/10/2013 22:40	52.8	63.8	57	47
31/10/2013 22:45	50.2	60.9	53	46
31/10/2013 22:50	51.5	72.4	54	46
31/10/2013 22:55	46.9	65.3	49	44
31/10/2013 23:00	50.9	74.4	52	44
31/10/2013 23:05	47.5	71.1	47	45
31/10/2013 23:10	46.6	66	47	44
31/10/2013 23:15	48.8	62.2	52	44
31/10/2013 23:20	47.6	59.2	50	45
31/10/2013 23:25	45.9	58.6	47	44
31/10/2013 23:30	47.2	72.7	47	44
31/10/2013 23:35	50.2	78.4	51	45
31/10/2013 23:40	45.8	55.8	48	44
31/10/2013 23:45	44.7	60.6	45	44
31/10/2013 23:50	44.5	52.4	45	43
31/10/2013 23:55	45.6	60.4	47	43
01/11/2013 00:00	44.9	57.8	46	43
01/11/2013 00:05	44.2	52.6	45	43
01/11/2013 00:10	44.1	60.9	45	43
01/11/2013 00:15	50.1	77.5	47	43
01/11/2013 00:20	49.6	75.8	49	44
01/11/2013 00:25	44.5	59.6	46	42
01/11/2013 00:30	43.4	60.5	44	42
01/11/2013 00:35	44.2	53.6	46	42
01/11/2013 00:40	46.1	72.5	47	42
01/11/2013 00:45	51.1	76.8	50	42
01/11/2013 00:50	53.6	74.6	51	41

Date and Time	$L_{Aeq(5\ minutes)}$ dB	$L_{Amax(fast)}$ dB	$L_{A10(5\ minutes)}$ dB	$L_{A90(5\ minutes)}$ dB
01/11/2013 00:55	54.4	81.3	51	41
01/11/2013 01:00	45.3	71.1	45	41
01/11/2013 01:05	44.4	61.7	46	42
01/11/2013 01:10	48.3	61.1	53	42
01/11/2013 01:15	42.3	56.4	43	41
01/11/2013 01:20	43.2	60.7	45	41
01/11/2013 01:25	45.5	72.4	46	41
01/11/2013 01:30	45.1	61	47	42
01/11/2013 01:35	49	78	47	41
01/11/2013 01:40	45.5	72.5	45	42
01/11/2013 01:45	44.8	62.1	48	41
01/11/2013 01:50	44.7	61.5	47	41
01/11/2013 01:55	44.3	65.5	45	41
01/11/2013 02:00	46.3	74.4	47	41
01/11/2013 02:05	52	78.2	51	42
01/11/2013 02:10	49.9	74.7	51	42
01/11/2013 02:15	52.7	77.5	50	42
01/11/2013 02:20	49.7	75.2	48	41
01/11/2013 02:25	50.1	78.7	49	41
01/11/2013 02:30	49.2	74.3	46	40
01/11/2013 02:35	49.8	79.8	44	41
01/11/2013 02:40	51	77.9	49	41
01/11/2013 02:45	54.6	77.9	54	41
01/11/2013 02:50	42.9	67.9	43	39
01/11/2013 02:55	42.1	62.4	43	39
01/11/2013 03:00	49.4	79.8	45	39
01/11/2013 03:05	49.8	76.3	46	40
01/11/2013 03:10	45.2	62.1	47	40
01/11/2013 03:15	46.8	68.2	49	39
01/11/2013 03:20	47.9	76.3	47	39
01/11/2013 03:25	43.7	59.7	45	40
01/11/2013 03:30	50.5	75.2	50	40
01/11/2013 03:35	46.8	74.3	45	39
01/11/2013 03:40	47.1	72.5	49	39
01/11/2013 03:45	56.2	79.7	57	41
01/11/2013 03:50	59.8	80.6	62	44
01/11/2013 03:55	54.6	78.4	56	40
01/11/2013 04:00	51.1	78.8	53	39
01/11/2013 04:05	49.8	77.7	48	39
01/11/2013 04:10	43	59.5	45	39
01/11/2013 04:15	53.1	77.6	49	39
01/11/2013 04:20	46.4	62.9	50	40
01/11/2013 04:25	45.3	73.2	42	39
01/11/2013 04:30	43.6	61	46	40

Date and Time	$L_{Aeq(5\ minutes)}$ dB	$L_{Amax(fast)}$ dB	$L_{A10(5\ minutes)}$ dB	$L_{A90(5\ minutes)}$ dB
01/11/2013 04:35	43.7	72.2	43	40
01/11/2013 04:40	51	75	49	40
01/11/2013 04:45	42.7	57.3	44	39
01/11/2013 04:50	47.8	76.8	47	39
01/11/2013 04:55	47.5	72.6	49	41
01/11/2013 05:00	44.5	59.4	46	41
01/11/2013 05:05	47	71.6	49	41
01/11/2013 05:10	53.3	78.3	53	41
01/11/2013 05:15	50.5	76.3	48	41
01/11/2013 05:20	45.8	66.1	47	42
01/11/2013 05:25	49.2	75.2	49	42
01/11/2013 05:30	47.4	74.9	48	42
01/11/2013 05:35	46.3	61.7	48	44
01/11/2013 05:40	48.2	73.4	47	43
01/11/2013 05:45	46.3	62.4	47	44
01/11/2013 05:50	45.1	54.8	46	44
01/11/2013 05:55	45.7	64.9	46	44
01/11/2013 06:00	48.1	63.3	50	44
01/11/2013 06:05	46.5	50.7	48	45
01/11/2013 06:10	47.6	60	48	46
01/11/2013 06:15	47.3	53.9	49	46
01/11/2013 06:20	46.9	53.7	48	46
01/11/2013 06:25	48.3	58.1	50	46
01/11/2013 06:30	47.7	51	49	46
01/11/2013 06:35	49.8	72.3	51	46
01/11/2013 06:40	50.7	71.7	51	47
01/11/2013 06:45	48.9	70.6	49	47
01/11/2013 06:50	50.1	75	50	47
01/11/2013 06:55	49.7	73.4	51	47
01/11/2013 07:00	50.3	73.5	51	47
01/11/2013 07:05	49.3	71.8	50	47
01/11/2013 07:10	49.8	71	50	47
01/11/2013 07:15	48.6	64	50	47
01/11/2013 07:20	49.4	59	51	47
01/11/2013 07:25	49.9	55.8	52	48
01/11/2013 07:30	48.3	52.7	50	46
01/11/2013 07:35	49.4	64.6	51	47
01/11/2013 07:40	48.8	57.6	50	47
01/11/2013 07:45	48.7	57.1	50	47
01/11/2013 07:50	49.6	56.2	51	48
01/11/2013 07:55	49.6	54.8	51	49
01/11/2013 08:00	50.8	60.2	53	48
01/11/2013 08:05	49.5	59.3	51	47
01/11/2013 08:10	51	59.7	53	49

Date and Time	$L_{Aeq(5\ minutes)}$ dB	$L_{Amax(fast)}$ dB	$L_{A10(5\ minutes)}$ dB	$L_{A90(5\ minutes)}$ dB
01/11/2013 08:15	50.2	58.5	51	49
01/11/2013 08:20	51.7	63.4	54	48
01/11/2013 08:25	51.8	65.7	53	49
01/11/2013 08:30	49.6	57.6	51	48
01/11/2013 08:35	51.1	59.2	54	49
01/11/2013 08:40	50.1	58.8	52	48
01/11/2013 08:45	50.3	58.1	52	48
01/11/2013 08:50	50.3	57.6	52	48
01/11/2013 08:55	52.9	61.7	56	49
01/11/2013 09:00	51.9	62.9	54	49
01/11/2013 09:05	51.7	61.4	54	48
01/11/2013 09:10	50.3	64	52	48
01/11/2013 09:15	50.9	72.2	52	48
01/11/2013 09:20	52	73.8	52	48
01/11/2013 09:25	50.3	59.9	52	48
01/11/2013 09:30	50.2	63.1	52	48
01/11/2013 09:35	50.6	75.9	52	48
01/11/2013 09:40	49.9	60	51	48
01/11/2013 09:45	49.9	62.3	52	47
01/11/2013 09:50	50	59.6	52	48
01/11/2013 09:55	49	62.6	51	48
01/11/2013 10:00	52.3	73.5	52	48
01/11/2013 10:05	51.2	69.9	53	48
01/11/2013 10:10	49	69.3	51	46
01/11/2013 10:15	49.6	72.1	52	46
01/11/2013 10:20	51.6	61.2	55	47
01/11/2013 10:25	50.8	64.1	53	48

Appendix 2/5614 – Measured One Hour Daytime Equivalent Noise Levels

Date and Time	$L_{Aeq(1\ hour)}$ dB
31/10/2013 11:00	47.7
31/10/2013 12:00	49.3
31/10/2013 13:00	50.9
31/10/2013 14:00	51.6
31/10/2013 15:00	52.3
31/10/2013 16:00	52.3
31/10/2013 17:00	52.3
31/10/2013 18:00	52.6
31/10/2013 19:00	52.3
31/10/2013 20:00	53.4
31/10/2013 21:00	52.7
31/10/2013 22:00	50.8
01/11/2013 07:00	49.3
01/11/2013 08:00	50.9
01/11/2013 09:00	50.6