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Acoustic Consultancy Report

Environmental Noise Survey Report and Noise Impact Assessment for Fixed Plant

Asda Southampton Westend

Client:	Asda Stores Ltd
Project:	Asda Store High Street Westend Southampton SO30 3DQ
Our Ref:	10814
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Index

Executive Summary	3
Section A – General	4
Section B – Environmental Monitoring	6
Section C – Fixed Plant	9
Appendix 1 – Environmental Monitoring Results	12
Appendix 2 – Site Plan	13
Appendix 3 – Glossary of Terms	14
Appendix 4 – Noise Impact Assessment Methodology	15

EXECUTIVE SUMMARY

Acoustic Consultancy Partnership Ltd have been appointed to undertake an environmental noise survey and complete a noise impact assessment for the proposed additional fixed plant at the Asda Westend, Southampton store.

Section A - General

The assessment has established the predicted plant noise levels at the nearest and most affected properties namely, the Westend Brewery Public House in Lower New Road to the east of the store, two storey dwellings in Chapel Road on raised ground to the north of the store and two storey dwellings fronting Lower New Road to the north east of the store.

Full details of the noise impact assessment is given in Section C within the report and briefly summarised below.

Section B – Environmental Monitoring

We have undertaken environmental noise monitoring at the northern side of the car park representative to the dwellings to the north of the store that have line of sight to the proposed new plant and are the most affected properties. Weekday evening and night time measurements were obtained.

Section C – Plant

We are not aware of any planning condition relating to plant noise for this site. We have therefore recommended a noise criteria at the receptor positions based on the methodology given in BS4142:2014.

Allowing for the nil excess of the rating level above the background sound level and also taking context into account, we conclude the overall impact of the cumulative operation of the plant for 24 hours a day, 7 days a week would be significantly less than low impact.

This would be acceptable in accordance with BS 4141:2014 without any mitigation measures to the new plant items.

SECTION A - GENERAL

1.0 Introduction

1.1 Acoustic Consultancy Partnership Ltd have been appointed to undertake an environmental noise survey and complete a noise impact assessment for the proposed additional fixed plant at the Asda Westend, Southampton store.

1.2 We have undertaken environmental noise monitoring at the northern side of the car park representative to the dwellings to the north of the store that have line of sight to the proposed new plant and are the most affected properties. Weekday evening and night time measurements were obtained.

1.3 A noise impact assessment has been completed, in accordance with the methodology given in BS4142:2014 and based on the measured existing $L_{A90,T}$ background noise levels.

1.4 Technical terms or references are occasionally used within this report. To assist the reader, a Glossary of Terminology is included in Appendix 3.

2.0 Site Layout and Nearest Noise Sensitive Receptors

2.1 The existing Asda store is located on the northern side of the High Street in Westend, Southampton and is relatively surrounded on all sides by properties with a number of different uses. Above the Asda store are offices at first floor level spanning most of the front façade of the store.

2.2 To the west and north west of the store, on the opposite side of Chapel Road, are three premises that provide child care and the Westend library. To the south, on the south side of High Street, are retail units, some of which have residential above at first floor level. These dwellings would be fully shielded from the new roof mounted plant by the offices above the store. To the east of the store is the Westend Brewery Public House with accommodation at first floor level. To the north and north east are two storey dwellings, those to the north being on raised ground.

2.3 At present, the main plant is located at roof level and it is proposed that two new condensing units would be positioned on the main roof area with condensing unit CU2 being located towards the High Street side of the roof and condensing unit CU3 being located towards the car park side of the roof. There will also be 3no A/C condensers located together on the main roof area towards the service yard area. It should be noted there is a small parapet wall around the perimeter of the roof area.

2.4 We have carefully surveyed the roof area to identify sight lines to the residential properties, including the Public House. We can confirm the Westend Brewery Public House with accommodation at first floor level, and the flats above retail on the south side of High Street would not have line of sight to the new plant items.

2.5 There are two sets of residential that will be the most affected noise sensitive properties as they have line of sight to the new plant items. These are the two storey dwellings in Chapel Road to the north of the site and the two storey dwellings in Lower New Road to the north west of the site.

3.0 Receptor Positions

3.1 For the plant noise impact assessment, we have selected three receptor positions as detailed below.

Receptor Position RPA	Westend Brewery Public House.
Receptor Position RPB	High View House fronting Chapel Road.
Receptor Position RPC	No 3 Lower View Road.

4.0 Project Information

4.1 Our noise impact assessment is based on the current plant drawings and plant noise data provided by CBES Ltd.

SECTION B – ENVIRONMENTAL MONITORING

5.0 Environmental Noise Monitoring Location

5.1 To determine the existing $L_{A90,T}$ background and $L_{Aeq,T}$ ambient noise levels of the surrounding area, one monitoring position was adopted as below.

Monitoring Position MP1	At the northern end of the store car park, level with the facades of the properties in Chapel Road and Lower End Road facing the store.

5.2 The results obtained were considered typical of the existing noise climate applicable to the most affected noise sensitive receptors. Access was not available to the rear façade of the Public House but adopting the monitoring position at the northern end of the store car park provides a robust set of results for this location.

5.3 The monitoring position is indicated on the site layout given in Appendix 2.

6.0 Noise Monitoring Period and Survey Weather Conditions

6.1 The noise monitoring periods were as follows.

Late evening	22.00 to 23.00 hours on Monday 19th January 2015.
Night Time	02.00 and 03.00 hours on Tuesday 20th January 2015.

6.2 The weather during both survey periods was dry with scattered cloud and a very light wind. The temperature was -1^0C during the evening survey and -2^0C during the night time survey.

6.3 Conditions were acceptable for environmental monitoring during both periods.

7.0 Monitoring Equipment

7.1 The noise monitoring equipment comprised of a Svantek 957 type 1 real time analyser, serial no 21436, with a weatherproof microphone protection system.

7.2 The meter calibration was verified before and after the measurement period, using a Svantek SV31 acoustic calibrator, serial number 22514. Any deviation was within an acceptable tolerance.

7.3 This meter and calibrator have current calibration certificates, available upon request.

8.0 Noise Measurement Parameters

8.1 The environmental survey established the prevailing L_{AFmax}, $L_{Aeq,T}$, $L_{A10,T}$ and $L_{A90,T}$ noise levels measured using an "F" time weighting with a 15 minute reference time period.

8.2 A Glossary of Terminology is given in Appendix 3.

9.0 Monitoring Results and Observations

9.1 We believe the recorded environmental noise measurements are representative of the existing noise climate levels applicable to the most affected noise sensitive receptors.

9.2 BS4142:2014 states "In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"

Furthermore BS4142:2014 states "There can be variability in the derivation of statistical parameters, so use integers when expressing the background sound level. A background sound level expressed to a precision of one decimal place implies incorrectly that the background sound level is exactly that value. Rounding is to be done on the basis that a value of 0.5 is rounded up."

9.3 The typical measured background noise levels assessed in accordance with BS4142:2014 and applicable to the operating periods of the plant are given below. A full set of measurements are provided in Appendix 1.

Receptor Position	Period	Typical Measured Background Noise Level dB $L_{A90(15min)}$
RPA	07.00-23.00	48
	23.00-07.00	42
RPB	07.00-23.00	48
	23.00-07.00	42
RPC	07.00-23.00	48
	23.00-07.00	42

Table 1 – Typical Measured Background Noise Level

9.4 During the evening survey period there was car activity from the store car park as the store closed at 23.00 hours. From 22.30 hours the car park started emptying so there were only three cars left in the car park at 23.00 hours. Traffic was regular on the surrounding roads becoming infrequent by the end of the evening period. There were 10 aircraft flyovers. No plant was audible from the store.

9.5 During the night time survey period there were no cars in the car park and no car movements. Traffic on the surrounding roads was light but there was distant traffic noise from the M27 motorway. There were 2 aircraft flyovers. The air handling unit on the roof was audible and we believe this may have been due to the operation of the gas burner.

SECTION C – FIXED PLANT

10.0 Proposed Hours of Operation

10.1 We understand the new plant items would operate on demand, 24hrs a day, 7 days a week.

11.0 Plant Noise Criteria

11.1 The two new condensing units and the three A/C condensers are to be installed on the store roof. In section 2.0 of this report we have confirmed there will be no line of sight from the plant to receptor position RPA but there will be line of sight from the plant to receptor positions RPB and RPC.

11.2 During the day (07.00-23.00), the British Standard requires the rating sound level to be established over a 1 hour reference time period and to be compared to the typical existing background sound level. During the night (23.00-07.00), the British Standard requires the rating sound level to be established over a 15minute time period and compared to the typical existing background sound level.

11.3 For our assessment we have assumed that the condensing units could run continuously during any day or night reference time periods but the A/C units would be daytime operation only.

11.4 In accordance with BS4142:2014 a +3dB acoustic correction has been applied to the plant activity for “other sound characteristics”.

11.5 Also, in accordance with BS4142:2014, we have taken the typical background sound level for each of the assessment periods.

12.0 Calculation Procedure

12.1 Calculations are based on our Excel programmes which provide the individual plant item noise levels at the receptor positions enabling an overall combined plant noise level to be determined. The calculations are based on standard methodology and take into account the distance correction and the barrier effects, where appropriate, of screens and any buildings.

13.0 Plant Noise Data

13.1 The manufacturers noise data used within this assessment is given below.

Plant Item	Sound Pressure level, dB
A/C 1 – Daikin RXS35L	48 dBA at 1m day only
A/C 2 – Daikin RXS50L	48 dBA at 1m day only
A/C 3 – Daikin RXS60L	49 dBA at 1m day only
CU2 – Searle N2CQ76	44 dBA at 10m day, 35 dBA at 10m night
CU3 – Searle NSQ15	42 dBA at 10m day, 39 dBA at 10m night

Table 2 – Plant Sound Pressure Levels

14.0 Un-attenuated Plant Noise Level

14.1 We have completed a calculation of the proposed **un-attenuated** total plant noise level at the facades of nearest residential properties, based on the plant noise levels detailed above. The cumulative plant rating noise levels at the selected receptor positions are given below, together with the excess of rating level above background.

Receptor Position	Time Period	Cumulative New Plant Rating Sound Level, dBA	Typical Background Sound Level, L_{A90T}	Excess of Rating Level above Background
RPA	07.00-23.00	32	48	Nil
	23.00-07.00	25	42	Nil
RPB	07.00-23.00	34	48	Nil
	23.00-07.00	29	42	Nil
RPC	07.00-23.00	33	48	Nil
	23.00-07.00	28	42	Nil

Table 3 – Plant Rating Level, Typical Background Sound Level and Resulting Excess

14.2 We consider the level of uncertainty of the measurements and assessment to be low and have no significant influence on the outcome of the assessment. The plant noise levels have been provided by the manufacturers for day and night operation and background sound levels were recorded adjacent to the receptor positions during a period of good weather conditions.

15.0 Fixed Plant Conclusions

15.1 The rating level of the cumulative plant does not exceed the typical background sound level at the receptor positions for any periods of operation.

15.2 BS 4142:2014 provides the following guidance on obtaining an initial estimate of the impact of the specific sound, based on the excess of the rating level above the background sound level.

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

15.3 BS4142:2014 also requires context to be taken into account. For this site, the following point is therefore of importance when considering the overall impact.

- Traffic activity, both from the surrounding area and the distant M27, is the predominant noise source with regular aircraft flyovers also a contributory factor.

15.4 **Allowing for the nil excess of the rating level above the background sound level and also taking context into account, we conclude the overall impact of the cumulative operation of the new plant for 24 hours a day, 7 days a week would be significantly less than low impact.**

15.5 **This would be acceptable in accordance with BS 4141:2014 without any mitigation measures to the new plant items.**

Appendix 1

Environmental Monitoring Results

MP1

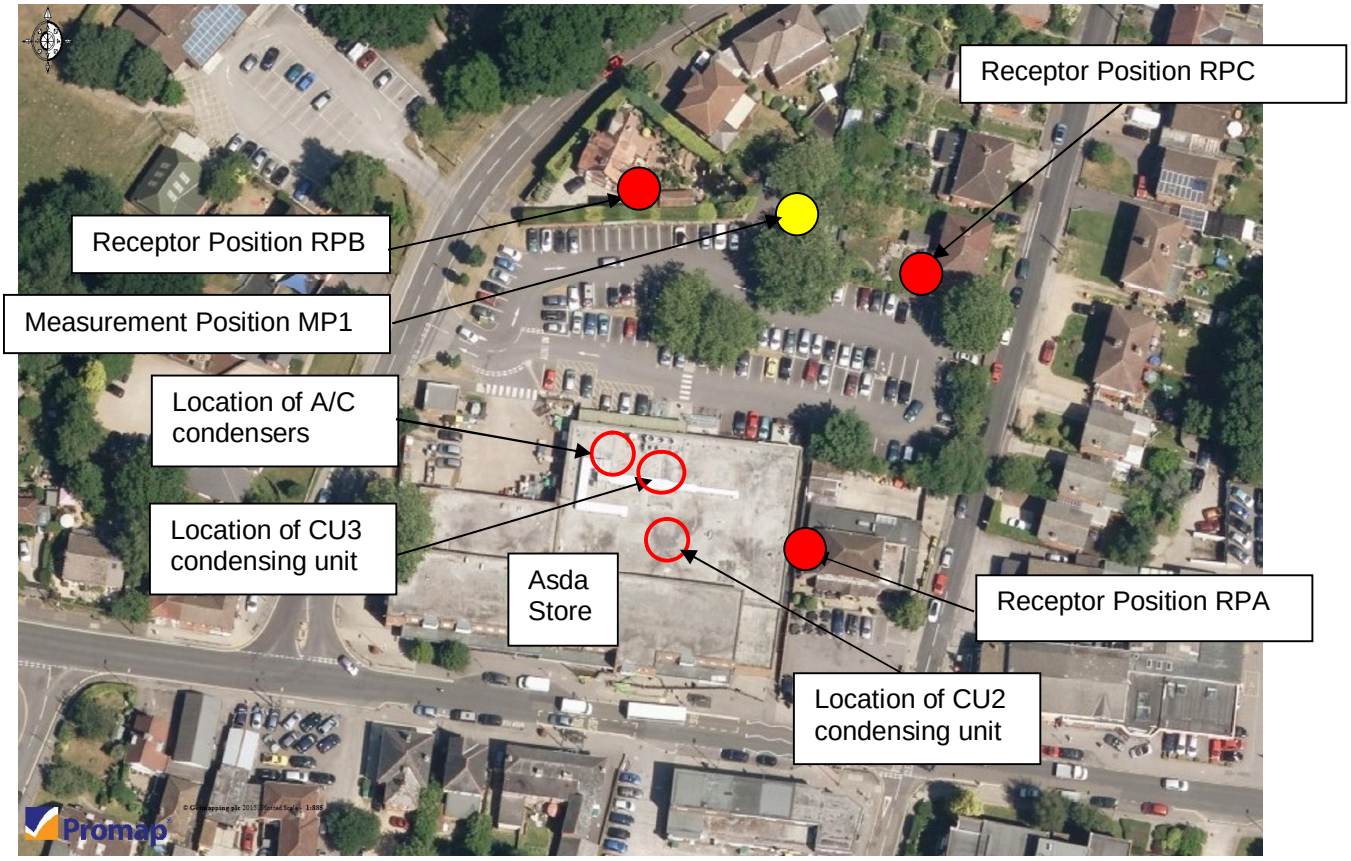
Time			Measured Sound Pressure Level, dB			
			L_{AFmax}	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
22.00	to	22.15	61.5	51.2	52.7	49.2
22.15	to	22.30	63.7	52.7	55.0	48.2
22.30	to	22.45	59.6	51.0	52.9	48.2
22.45	to	23.00	62.5	49.1	50.8	46.4

Time			Measured Sound Pressure Level, dB			
			L_{AFmax}	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
02.00	to	02.15	54.1	46.5	49.2	41.6
02.15	to	02.30	53.5	44.9	50.9	40.2
02.30	to	02.45	60.3	45.8	51.9	41.7
02.45	to	03.00	56.9	46.8	53.6	42.2

ACP

Appendix 2

Site Plan



Appendix 3

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.

Appendix 4

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 store plant noise.

BS 4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound

This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes

a) Sound from industrial and manufacturing processes
b) Sound from fixed installations which comprise mechanical and electrical plant and equipment
c) Sound from the loading and unloading of goods and materials at industrial and/or commercial premises
d) Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes

The methods described in the British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

The Standard confirms that certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where appropriate, a rating penalty should be established based on a subjective assessment of its characteristics at the receptor position. This method is appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

National Planning Policy Framework (NPPF)

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). Again, this document does not provide any specific guidance on assessment methodology.