

Savills

PETS AT HOME, HAVANT
Environmental Noise Assessment

Report No. 16-0070-0 R01



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Noise Impact Assessment

Report No.: 16-0070-0 R01

Date: 02 August 2016

Prepared by:

Jim Smith MEng(Hons) AMIOA



Chris Matheson MEng(Hons) MIOA



Managing Director: Peter Rogers BSc(Hons) MSc CEng FIOA

5 Charlecote Mews, Staple Gardens, Winchester, Hampshire. SO23 8SR
T +44 (0)1962 858800 E sa@sustainableacoustics.co.uk W www.sustainableacoustics.co.uk
Registered in England • Company No 08149321 • VAT Registration No 180557205





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1 INTRODUCTION

Sustainable Acoustics Ltd has been instructed to carry out a plant noise assessment of the proposed air conditioning units at Pets at Home, Solent Retail Park, Havant, to support the planning application for a refurbishment to the existing Pets at Home store. It is proposed to install sixteen air conditioning units on the rear of the site, at ground floor level, in the service yard. An environmental noise survey and assessment has been carried out, and this report details the results and recommendations for the installation, for submission alongside the planning application.

1.1 Context

Figure 1 gives an overhead view of the site, showing the intended position of the air conditioning units, at the rear of the store. The nearest receivers are the residential buildings to the north, at Brockhampton Lane House, also shown in Figure 1. The planned elevation of the units at the back of the building is shown in Figure 2.

2 PLANNING GUIDANCE

2.1 National Planning Policy Framework

Current planning policy is based on the National Planning Policy Framework (NPPF), published in March 2012, which supports a presumption in favour of development, unless the adverse impacts of that development would outweigh the benefits when assessed against the policies in the Framework, taken as a whole.

The noise implications of development are recognised at paragraph 123, where it is stated that planning policies and decisions should aim to

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established.*

2.2 Noise Policy Statement for England

Paragraph 123 of the NPPF also refers to advice on adverse effects of noise given in the Noise Policy Statement for England¹ (NPSE). This document sets out a policy vision to

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development”.

¹ Department for Environment, Food and Rural Affairs, *Noise Policy Statement for England*, London, 2010



To achieve this vision the Statement sets the following three aims:

- *avoid significant adverse impacts on health and quality of life*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.*

2.3 Local planning policy

Havant Borough Council give the following relevant policies on noise in their Core Strategy:

“Policy CS16 High Quality Design

Planning permission will be granted for the development that is designed to a high standard, which helps to create places where people want to live, work and relax. All development should demonstrate that its design:

1) Responds to, draws inspiration from, and respects local context and: ... e) The development does not cause unacceptable harm to the amenity of neighbours through smell, the loss of privacy, outlook, noise and overlooking.”

“Policy DM10 Pollution

Development that may cause pollution of water, air, soil or pollution through noise, smell, smoke, fumes, gases, steam, dust, vibration, light, heat, electromagnetic radiation and other pollutants will only be permitted where all of the following relevant criteria can be met:

- 1. The health and safety of existing and future users of the site, or nearby occupiers and residents is not put at risk...”*

Section DM10 of the Core Strategy also makes reference to the use of BS: 4142 as a method for rating industrial noise affecting mixed and residential and industrial areas. This standard is outlined in the following section.

2.4 British Standard BS 4142: 2014

The British Standard BS 4142: 2014, *Methods for rating and assessing industrial and commercial sound* is an update of the previous edition of the standard, and describes methods for rating and assessing sound of an industrial and/or commercial nature, 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 sound from the industrial/commercial source is rated by taking into account the sound level of the source, known as the specific sound level, and its characteristics, such as tonal, impulsive or intermittency of the source, and applying an appropriate correction to give the rating level of the sound source. To gain an initial estimate of the potential impacts of the sound source, it is compared to the background noise level, and the level by which the rating level exceeds the background noise level indicates the following potential impacts:

Difference	Assessment
Around 10 dB or more	Likely to be an indication of a significant adverse impact, depending on the context
Around 5 dB	Likely to be an indication of an adverse impact, depending on the



	context
0 dB or less	An indication of the specific sound source having a low impact, depending on the context

The standard states that “where an initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following:

- 1) *The absolute level of the sound*
- 2) *The character and level of the residual sound compared to the character and level of the specific sound*
- 3) *The sensitivity of the receptor”*

The standard also requires an indication of the uncertainty of the assessment made.

The previous edition of the standard was widely used by local planning authorities in order to provide limits for industrial noise sources suited to the locality and development plans. While the scope and methodology has been redefined by this edition of the standard, it is likely that the principles of the assessment will be used in a similar way.

2.5 British Standard 8233: 2014

The British Standard BS 8233: 2014, *Guidance on Sound insulation and noise reduction for buildings* provides additional guidance on noise levels from sources without specific character in the built environment, based on the recommendations of the World Health Organisation. The criteria desirable levels of steady state, “anonymous” noise in unoccupied spaces within dwellings, from sources such as road traffic, mechanical services and other continuously running plant, are tabulated below:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq, 16 \text{ hour}}$	-
Dining	Dining room/area	40 dB $L_{Aeq, 16 \text{ hour}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16 \text{ hour}}$	30 dB $L_{Aeq, 8 \text{ hour}}$

It is noted, however that where development is considered necessary or desirable, despite external noise level above WHO guidelines, the above target levels may be relaxed by up to 5 dB.

The standard also recommends that for traditional external amenity areas, such as gardens, it is desirable that external noise levels do not exceed 50 dB $L_{Aeq, T}$, and that 55 dB $L_{Aeq, T}$ would be acceptable in noisier environments. However, it is recognised that these values may not be achievable in all areas where development is desirable, and in such locations, development should be designed to achieve the lowest practicable levels.



It is also noted that noise limits should not be necessary for external areas, such as balconies, roof gardens and terraces, where normal external amenity space is limited. However, the general guidance for noise in amenity space used for relaxation is still appropriate in protecting these areas.

3 AMBIENT NOISE SURVEY

Existing noise levels were measured in 15 minute periods between Friday 15th July and Monday 18th July 2016. The measurement position was chosen to be at a location at the east boundary of the service yard, so as to capture levels representative of the nearby residential properties. Measurements were taken at approximately 2.5m from ground level.

It was observed during the site visit that the continuous noise levels behind the retail park were governed by traffic movements from the surrounding road network, and maximum noise levels were observed to be from accelerating vehicles.

The weather was generally calm and warm, with temperatures ranging between 11-15 °C at night and 13-25 °C during daytimes, for the measurement period. Winds were generally westerly, and were below 3m/s other than some gusts on the afternoon of the 15th.

3.1 Instrumentation

Continuous monitoring of sound levels was undertaken using a Rion sound level meter, type NL-32 (serial number 0024066790), with a Rion type NX-22J Sound Monitor Card installed (serial number 00630553, version 2.1) and a Rion type UC-53A ½ - inch free field microphone (serial number 305924) and a Rion type NH-21 pre-amplifier (serial number 10711) fitted. The microphone was fitted with a windshield during measurements. The sound level meter, microphone and preamplifier were last calibrated in a calibration laboratory on 3 February 2015 and calibration and conformance certificates are available.

Prior to and on completion of the survey, the sound level meter and microphone calibration was checked using a Rion type NC-74 Sound Level Meter Calibrator (serial number 00830811). The Calibrator was last calibrated on 14 January 2015, in accordance with the requirements of ISO 10012 and a calibration and conformance certificate is available. No significant change in the calibration level occurred during the survey.

3.2 Measured Noise Levels

The measured noise levels outside at the chosen measurement position are given below in Table 1, and a graphical representation shown in Figure 3

Period	L _{Aeq} (dB)		L _{A90} (dB)	L _{Amax,f} (dB)
	Range (15min)	Average (Day/Eve/Night 12/4/8hr)	Range (15min)	Range (15min)
Daytime	49 – 69	57	44 – 57	59 – 89
Evening	50 – 61	56	46 – 56	63 – 88
Night-time	41 - 61	52	37 - 51	51 - 90

Table 1 – Measured noise levels outside the building



It can be seen from Figure 3 that the existing background noise levels are fairly continuous during the day and drop off gradually into the night, with the lowest levels occurring around 3:00am. Peaks in the ambient level are most likely due to use of the service yard.

4 PLANT NOISE

4.1 Plant Noise Assessment

British Standard: 4142 is deemed an appropriate methodology to establish criteria for the plant noise limits. The rating level can be defined as the final plant noise level to be compared with the existing background noise level; with a difference of 0dB giving an indication of the specific sound source having a low impact (when taking account of the character and context of the noise).

Minimum Existing Background Noise Level, ($L_{A90, 15min}$)	
Daytime (07:00-19:00)	44
Evening (19:00-23:00)	46
Night time (23:00-07:00)	37

Table 2 – Background noise levels

It is understood that the Mitsubishi air conditioning units to be installed at the rear of unit 6 are as listed below. The sound power levels are calculated from the manufacturer's data.

Unit	Quantity	dB(A)	Octave centre band frequency, Hz							
			63	125	250	500	1k	2k	4k	8k
PUHZ-ZRP125VKA	6	70	80	73	71	68	65	60	56	48
MUZ-SF25VE	4	58	61	63	60	55	52	49	42	37
MUZ-SF35VE	1	62	62	66	63	60	57	53	47	42
MUZ-SF50VE	5	65	69	68	65	62	60	57	50	45

Table 3 – Octave band sound power levels of external air conditioning units

To calculate the rating level of the plant, the corrections for the character of the plant noise must be added to the specific noise level of the plant. These inverter driven units turn on gradually and will gradually vary in speed depending on the demand for heating or cooling and are therefore unlikely to have an adverse impulsive or intermittent character.

BS 4142:2014 specifies that a penalty is to be applied to a noise source with a tonal noise character, with the penalty ranging from 2dB for a tone which is just perceptible, to 6dB for a tone that is highly perceptible.

The method typically used to assess this would be an analysis of the $\frac{1}{3}$ -octave band frequency spectrum of the noise; or a subjective method. Only octave band frequency data is available for the units, so it is appropriate to consider similar units. Generally the noise from these types of units is not found to have significant tonal character when the level is low relative to the ambient noise levels. Therefore it is not considered that any correction should be added for the tonal nature of the plant noise. However, it has been found that the low frequency nature of the noise from this type of



unit can be noticeable against a background noise environment, and therefore it is appropriate to add a 3dB penalty may be added where noise is “readily distinctive against the residual acoustic environment”, in accordance with BS4142:2014

The closest receiver windows are at the ground floor level and are approximately 53 metres from the intended location of the plant, as shown in Figure 1. The attenuation expected from a point source radiating hemispherically when 53 metres away would be 42 dB.

An overall level at the receiver has been calculated by undergoing propagation calculations of each unit individually, based on their highest potential noise levels, and then combining the noise levels at the receiver position. The resulting rating noise level at the receiver window are calculated to be 40 dB(A) with all the units running, including an additional 3dB penalty.

It is important to consider at what times of day the plant is to be running. It is understood that outside opening hours (i.e. over the night-time periods), only the six sales floor units will potentially be running; which are taken to be the larger units at the left hand side of Figure 2. With this as the case, and with a 3dB penalty added, the rating level at the receiver windows is calculated to be 39 dB(A).

BS 4142: 2104 assesses the rating of the plant noise level against the background noise level, in order to indicate the likelihood of an adverse impact on the occupants of the residential property. This comparison is shown below:

	Minimum Existing Background Noise Level, ($L_{A90, 15min}$)	Calculated rating level of the proposed plant at the neighbouring windows, (L_{Aeq})	BS4142 Assessment level
Daytime (07:00-19:00)	44	40	-4
Evening (19:00-23:00)	46	40	-6
Night time(23:00-07:00)	37	39	+2

Table 4 – BS 4142: 2014 assessment of air conditioning unit noise against background

It is noted that the data used in the calculation is based on the units operating at their full capacity simultaneously; in reality it is unlikely that this would be the case, particularly during night hours.

BS 4142:2014 states that where the rating level does not exceed the existing background noise level, it is an indication of low impact, depending on the context. The assessment therefore gives an indication that there may be an impact on the occupants of the residential properties during the quietest part of some night-time periods, but it is noted that this is a worst-case scenario and unlikely to occur often. It would be expected that the speed at which the units would be required to run during the night-time (in lower ambient temperatures) would reduce the noise levels by at least 3 dB, which would reduce the plant noise levels predicted at the nearest noise sensitive property to below the existing lowest background noise levels.

It is also relevant to consider the absolute plant noise levels incident on the residential property. BS 8233 gives guideline values for internal ambient noise levels of ‘anonymous’ noise sources. The standard gives a recommendation of 35 dB $L_{Aeq, 16hr}$ to be achieved in a bedroom during the daytime, and 30dB $L_{Aeq, 8hr}$ to be achieved during the night-time. The standard also indicates that a level of



15dB attenuation would be expected through an open window partially open for ventilation (Annex G.1 of BS 8233:2014). An external level of 40 dB(A) would result in internal levels of approximately 25 dB(A) when windows are open, which is also below the criteria given in BS:8233 for recommended daytime levels in bedrooms. Similarly, an external level of 39 dB(A) would therefore result in internal levels of approximately 24 dB(A) when windows are open, which is below the criteria given in BS:8233 for recommended night-time sleeping levels in bedrooms. Similarly, if the plant noise levels during the night-time reduced by 3 dB, the resultant internal noise levels would be reduced further to 21 dB(A).

Although the plant noise levels at night may be potentially above the existing background noise levels at the receiver window, the absolute plant noise levels incident on the closest residential properties would cause internal ambient levels that are below the criteria given in BS 8233:2014, and are therefore it is considered unlikely that the plant noise would be noticeable within the residential properties.

5 SUMMARY AND CONCLUSION

A noise assessment has been carried out at Solent Retail Park, Havant, to establish if the proposed air conditioning units will be acceptable in terms of noise impact on the nearby residential buildings. The plant noise levels have been assessed using methodology within BS 4142:2014, and also compared against guidance given in BS 8233:2014. It is concluded that the absolute noise levels incident on the closest residential properties are sufficiently low, and so are not considered likely to cause an adverse impact on the residential properties, and therefore no mitigation is recommended.



Figure 1 – Overhead view of site

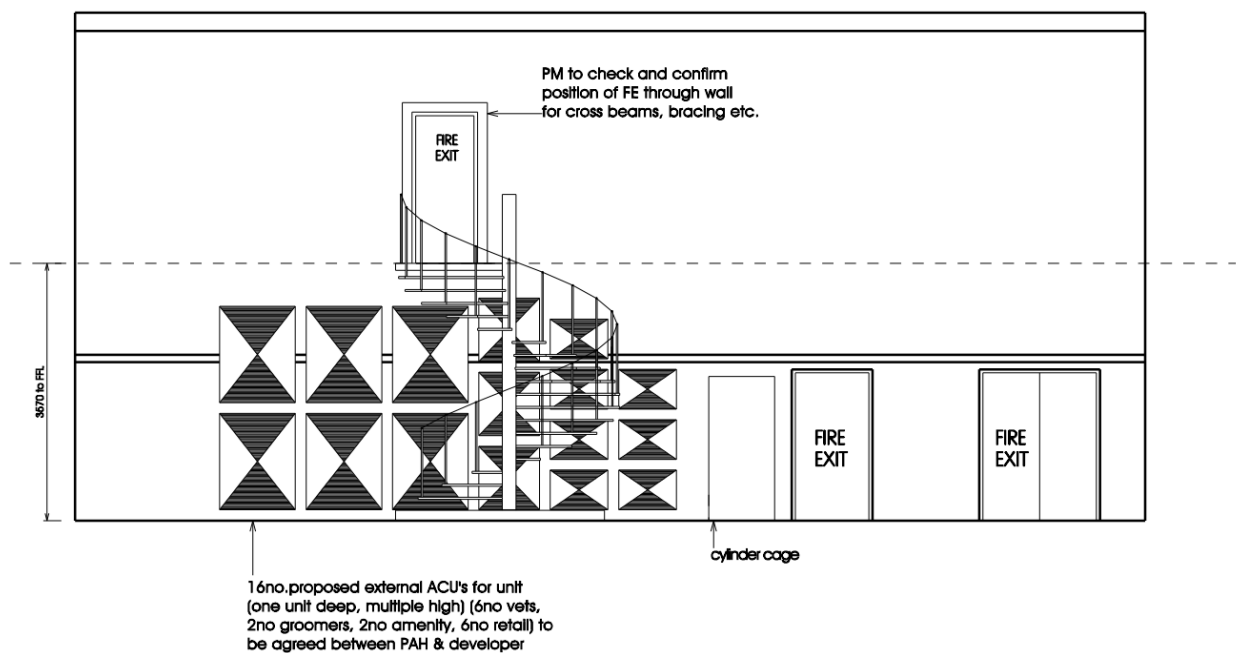


Figure 2 – Proposed Rear Elevation

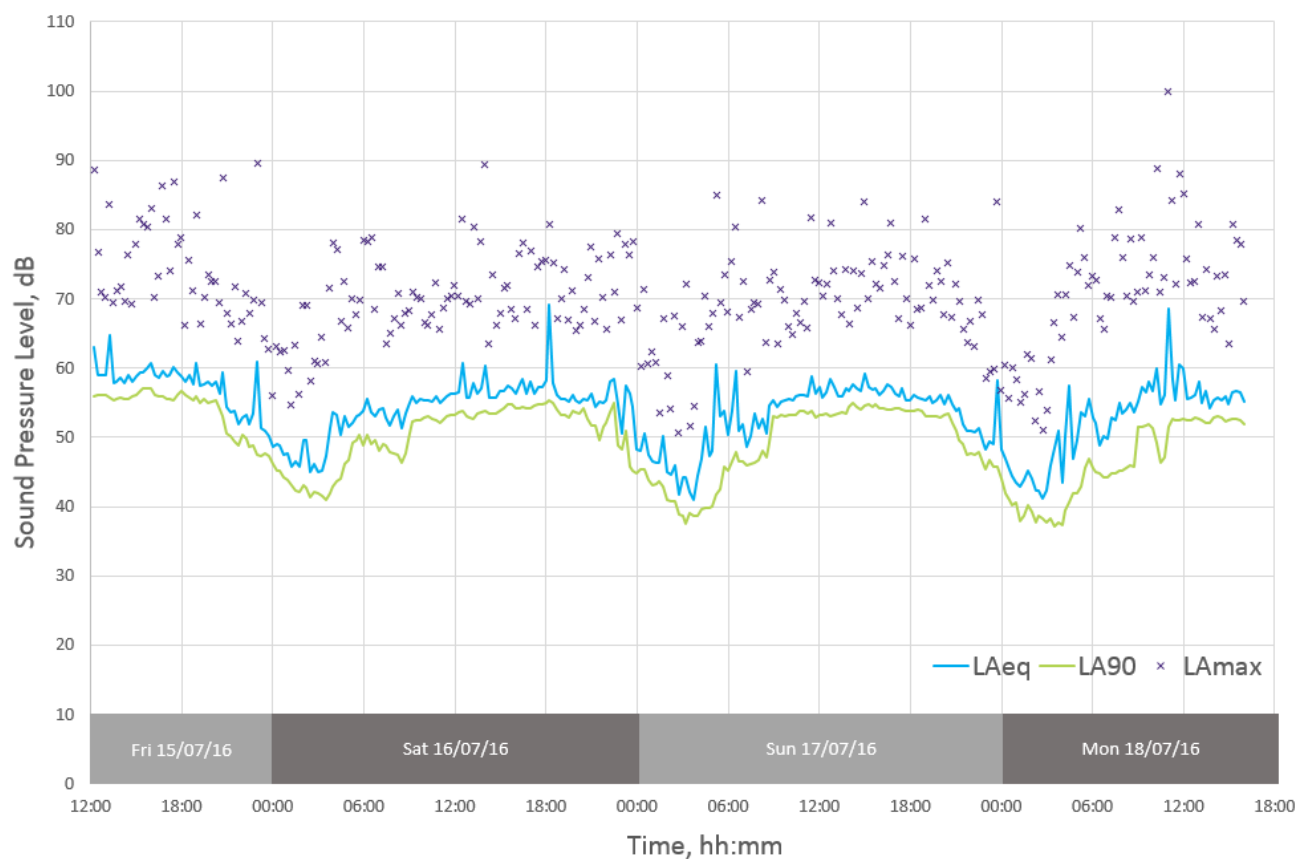


Figure 3 – Time history of acoustic parameters



Figure 4 – Monitoring position