

SHARPS REDMORE

ACOUSTIC CONSULTANTS ▪ Established 1990



Report

Environmental Noise Report

Bensons for Beds, Reading
Link Retail Park

Prepared by

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Project No 1615866

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1.0 Introduction

- 1.1 Sharps Redmore (SR) has been instructed to carry out an environmental noise assessment at Bensons for Beds, Reading Link Retail Park.
- 1.2 Bensons for Beds is located in the retail park on Rose Kiln Lane. The site is bordered by a small river (Holy Brook) followed by residential streets to the North and West. The A33 runs past the retail park to the South East along with further commercial land usage. The nearest noise sensitive property to the site is at 15 Trelleck Road.
- 1.3 Bensons for Beds have submitted a planning application to install two air conditioning condenser units on the western façade of the building. The location of the plant is shown in Appendix A to this report. The mechanical plant in question will only be in operation during the trading hours of the store. In response to the application, Reading Borough Council has responded as follows:

"I have concerns about the impact of noise from the proposed air conditioning plant on nearby noise sensitive receptors – due to the location of the proposed plant on the western façade there is potential for Noise from the plant to affect nearby residents at 'Trelleck', depending on the noise levels produced by the plant and the hours of operation."

- 1.4 To assess the impact of the proposed plant installation, SR has carried out an environmental noise assessment to determine the existing background noise levels at locations representative of the nearest noise sensitive properties on Trelleck Road, as identified by Reading Borough Council.
- 1.5 The purpose of this report is to assess the proposed plant installation in accordance with BS 4142:2014, to ensure the protection of the amenity of neighbouring residents.
- 1.6 Section 2.0 contains a discussion of the available methods of assessment and assessment criteria.
- 1.7 Section 3.0 of this report contains details of the environmental noise survey.
- 1.8 Sections 4.0 of the report contains an assessment of the impact of noise from the development on the surrounding residential properties.
- 1.9 A guide to the acoustic terminology used within the report is included in Appendix B.

2.0 Assessment Methodology and Criteria

National Policy

- 2.1 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In regard to noise, Paragraph 123 of the NPPF states the following:

"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, while recognising that many developments will create some noise; 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"*

- 2.2 Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Practice Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The guidance contained in the NPPG is summarised in the table below:

Table 2.1: Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the	Significant Observed Adverse Effect	Avoid

Perception	Examples of Outcomes	Increasing Effect Level	Action
	noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

- 2.3 The NPPF and NPPG reinforce the March 2010 DEFRA publication, “Noise Policy Statement for England” (NPSE), which states three policy aims, as follows:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *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.”*

- 2.4 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

“... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.”

- 2.5 Therefore taking an overview of national policy it is clear that when considering the impact of noise one must consider the significance of any impact. The presence of an adverse impact in itself is not sufficient to refuse permission.

Local Policy

- 2.6 Reading Borough Council has a core strategy in relation to planning that can be taken into account along with guidance at a national level. Policy CS 34: Pollution and Water Resources states the following:

“Development will only be permitted where it would not be damaging to the environment through air, land, noise or light pollution...”

This reinforces the national-level emphasis placed on planning in such a way that does not affect the amenity of local residents with regards to noise pollution.

- 2.7 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- i) The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:1999 and World Health Organisation "Guidelines for Community Noise" contain such guidelines.
- ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.
- iii) Another method is to compare the resultant noise level against the background noise level (L_{A90}) of the area. This is the method employed by BS 4142:1997 to determine the likelihood of complaint from noise of an industrial or industrial type nature. It is best suited to the assessment of steady or pseudo-steady noise and is therefore considered the most appropriate assessment method in this case.

BS 4142:2014

2.8 This building standard describes a method for rating and assessing sound of an industrial and/or commercial nature according to the following summary process:

- i) Determine the background sound levels, in terms of L_{A90} , at the receptor locations of interest.
- ii) Determine the specific sound level of the source being assessed, in terms of L_{AeqT} level ($T = 1$ hour for day or 15 minutes at night), at the receptor locations.
- iii) Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent or other characteristic which attract attention.
- iv) Compare the rating sound level against the background noise level; the greater the difference between the two, the higher the likelihood of complaints of the noise.
- iv) Differences (rating – background) of around +10 dB is likely to be an indication of significant adverse impact (SOAEL) depending on context; a difference of +5 dB is likely to be an indication of adverse impact, depending on context. 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 upon context.

2.9 The general intent of the planning system is to ensure that a development does not result in 'significant adverse impacts on health and quality of life' (NPPF para 123). BS 4142:2014 considers that the threshold of 'significant adverse impact' is likely to be around 10 dB or more... depending on upon the context.

2.10 As can be seen above the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound exceeds the background sound level and the context in which it is placed.

3.0 Survey Details

- 3.1 A noise survey was undertaken at the site between the 25th and 26th January 2016 to obtain measurements of existing noise levels. Measurements were taken outside 15 Trelleck Road as shown in Fig 1 below. This measurement location was chosen to represent the nearest noise sensitive properties to the proposed condenser unit installation.

Fig 1: Monitoring Location 



- 3.2 Weather conditions throughout the survey period were dry with a southerly wind ($>12\text{m/s}$), and overcast. Temperatures were between 10 and 14°C .
- 3.3 Measurements were taken using a Norsonic 118 type 1 sound level meter which was correctly calibrated before and after use. The meter was set up to continuously record existing noise levels at 15 minute intervals throughout the survey period. The equipment used and measurement procedures employed, comply with the requirements of BS 4142:2014.
- 3.4 Measurements were taken at 15 minute intervals between 1500 – 1600 and 1900 – 2100 hours on Monday the 25th; then between 0900 – 1030 hours on Tuesday the 26th of January. These measurement periods were chosen to represent the background noise levels at times during which the proposed plant installation would be most likely to cause disturbance to the amenity of surrounding residents. Details of the survey results are summarized in table 3.1 below. The full results of the survey can be found in Appendix C.

Table 3.1: Summary of noise survey results

Period	L _{Aeq15min} (average)	L _{Amax}	L _{A9015min}
Monday 1500 – 1600	51 – 54	66 – 70	48 – 49
Monday 1900 – 2100	47 – 52	50 - 74	42 – 44
Tuesday 0900 - 1030	51 - 55	58 - 72	49 - 50

- 3.5 The minimum background noise level (L_{A9015min}) at a time during which the proposed plant will be operational is 42 dB L_{A90,15min}.

4.0 Assessment Details and Conclusion

- 4.1 The proposed plant installation consists of two FDC140VSX condenser units and one SRC50Z condenser unit to be mounted on the external wall of the building, on brackets and contained within security caging.

The manufacturer's noise data for the condenser units to be installed states the following:

- FDC140VSX: 52 dBA (at 1 metre height and distance)
- SRC50Z: 47 dBA (at 1 metre height and distance)

The air conditioning units will only operate during trading hours, which are as follows:

- Monday to Friday: **1000 – 2000 hours**
- Saturday: **0900 – 1800 hours**
- Sunday: **1100 – 1700 hours**

- 4.2 The nearest noise sensitive properties as identified by Reading Borough Council area will be 15 Trelleck Road and the neighbouring properties at both Trelleck Road and St. Saviours Road. The distance from the proposed installation to the middle of the nearest neighbouring garden is 81 metres.
- 4.3 With regard to the assessment of industrial noise sources in commercial premises, BS 4142:2014 enables the resultant sound from new equipment to be compared to the existing background sound level (L_{A90}) of an area to assess the significance of impact.
- 4.4 To prevent significant adverse impacts on the health and quality of life of existing noise sensitive receptors, the "rating noise level" (the predicted noise level plus any penalty for character), should not exceed the typical measured daytime and night time background noise level by more than 10 dB, and to prevent adverse harm by around 5 dB depending on context. Where the rating level does not exceed the background noise level, this is an indication of a specific sound having a low impact. In view of the survey results outlined in Section 3, it is recommended that in this case plant noise levels should not exceed background noise levels at the nearest noise sensitive receptors (properties on Trelleck Road).

Daytime background (0800 – 2200 hrs) = 42 $L_{A9015min}$

- 4.5 Table 4.1 below details the BS 4142 methodology applied to this particular case.

Table 4.1: Summary of BS 4142 calculation

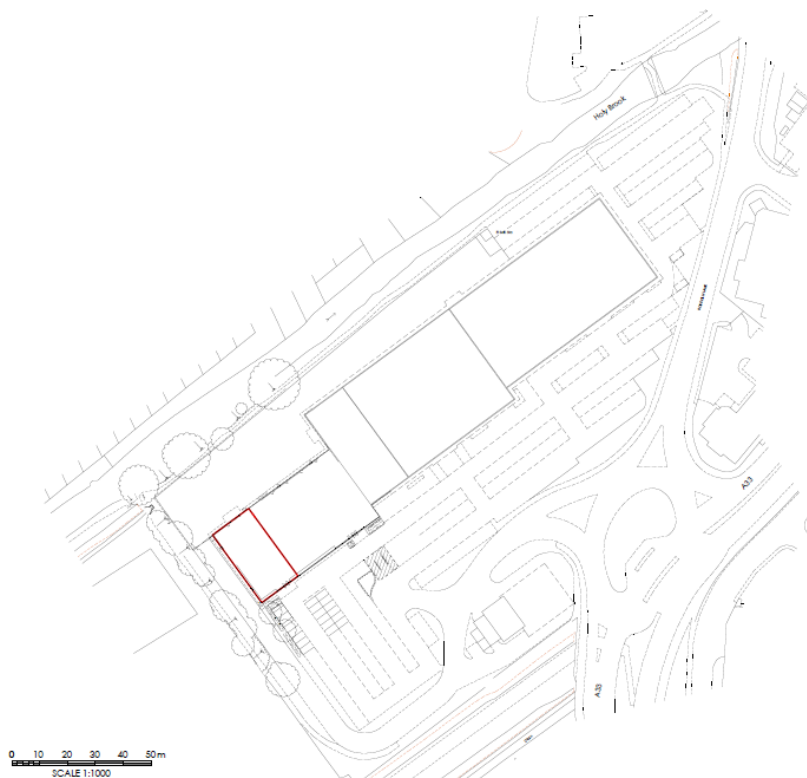
	FDC140VSX	SRC50Z
Baseline noise (at 1m, from manufacturer)	52 dBA	47 dBA
Distance from receptor	81m	81m
Distance attenuation (20log(1/81))	-38 dBA	-38dBA
Correction for tonality, character etc.	+0 dBA	+0 dBA
Resultant level	14 dBA	9 dBA
Overall specific noise level	15 dBA	

- 4.6 Predicted noise levels will be 27 dBA below the lowest recorded background noise level measured during the noise survey.
- 4.7 The final stage of the BS 4142 assessment is to correct the specific noise level for any acoustic features. Based on the predicted noise level it is not considered that any tonal or intermittent features will be noticeable and therefore a feature correction is not applicable in this case. Notwithstanding the above, even if the maximum acoustic feature correction is applied, predicted sound levels from the plant will still be significantly below the background noise levels measured.
- 4.8 It is therefore concluded that noise from the installation of the proposed plant will not cause significant adverse effect on local residents in line with the national policy aims as set out in the NPPF and NPSE.

APPENDIX A

PLANS (PROPOSED INSTALLATION)

Notes:
To be read in conjunction with drawings & specifications by other consultants / specialist contractors

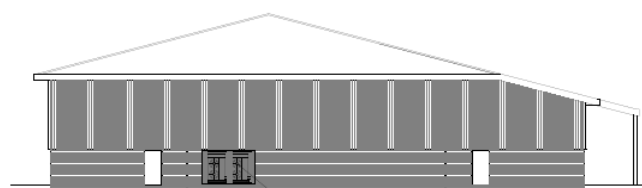
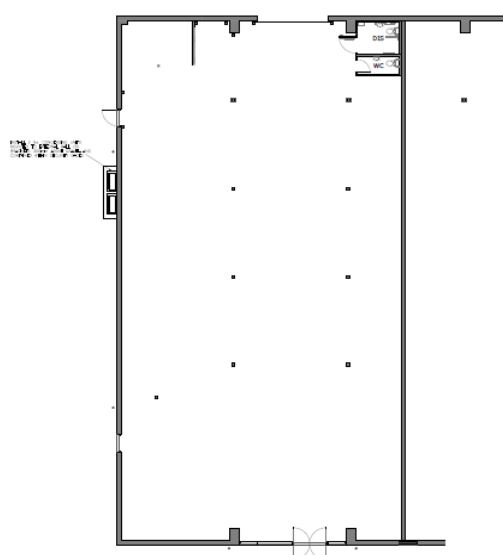


Rev	Date	Comments

Client: Harveys	
Project: Unit 1A, Reading Link Retail Park, Rose Kiln Lane, READING, RG2 0SN	
Title: Location Plan	
Project No.: 2156	Date: 09.12.15
Drawing No.: LOC	Rev.: -
Scale: 1:1250 @ A3	Drawn: SGR

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e-mail: office@twentytwenty.co.uk
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Notes:
Do not scale from drawing; all dimensions to be checked on site prior to commencement of work and any discrepancies to be reported immediately to twenty twenty.
To be read in conjunction with drawings & specifications by other consultants / specialist contractors



PROPOSED SIDE ELEVATION
Scale 1:100

PROPOSED FLOOR PLAN
Scale 1:100

Rev	Date	Comments

PLANNING

Client: Steinhoff UK Group Properties Ltd	
Project: Unit 1A, Reading Link Retail Park, Rose Kiln Lane, READING, RG2 0SN	
Title: Proposed floor plan and elevation	
Project No.: 2156	Date: 09.12.15
Drawing No.: SC	Rev.: -
Scale: 1:100 @ A1	Drawn: SGR

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APPENDIX B

ACOUSTIC TERMINOLOGY

Acoustic Terminology

- A1 Noise, defined as unwanted sound, is measured in units of decibels, dB. The range of audible sounds is from 0 dB to 140 dB. Two equal sources of sound, if added together will result in an increase in level of 3 dB, i.e. 50 dB + 50 dB = 53 dB. Increases in continuous sound are perceived in the following manner:
- 1 dB increase - barely perceptible
 - 3 dB increase - just noticeable
 - 10 dB increase - perceived as twice as loud
- A2 Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18000Hz (or 18kHz). The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.
- A3 To take account of the varying sensitivity of people to different frequencies a weighting scale has been universally adopted called "A-weighting". The measuring equipment has the ability automatically to weight (or filter) a sound to this A scale so that the sound level it measures best correlates to the subjective response of a person. The unit of measurement thus becomes dBA (decibel, A-weighted).
- A4 The second important characteristic of sound is amplitude or level. Two units are used to express level, a) sound power level - L_w and b) sound pressure level - L_p . Sound power level is an inherent property of a source whilst sound pressure level is dependent on surroundings/distance/directivity, etc. The sound level that is measured on a meter is the sound pressure level, L_p .
- A5 External sound levels are rarely steady but rise or fall in response to the activity in the area - cars, voices, planes, birdsong, etc. A person's subjective response to different noises has been found to vary dependent on the type and temporal distribution of a particular type of noise. A set of statistical indices have been developed for the subjective response to these different noise sources.
- A6 The main noise indices in use in the UK are:
- L_{A90} : The sound level (in dBA) exceeded for 90% of the time. This level gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background sound level" of an area.
 - L_{Aeq} : The equivalent continuous sound level in dBA. This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the intermittent noise". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as aircraft and trains.

L_{A10} : The sound level (in dBA) exceeded for 10% of the time. This level gives an indication of the sound level during the noisier periods of time in any given sample. It has been used over many years to measure and assess road traffic noise.

L_{AMAX} The maximum level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.

- A7 The sound energy of a transient event may be described by a term SEL - Sound Exposure Level. This is the L_{Aeq} level normalised to one second. That is the constant level in dBA which lasting for one second has the same amount of acoustic energy as a given A weighted noise event lasting for a period of time. The use of this unit allows the prediction of the L_{Aeq} level over any period and for any number of events using the equation;

$$L_{AeqT} = SEL + 10 \log n - 10 \log T \text{ dB.}$$

Where

n = Number of events in time period T.

T = Total sample period in seconds.

- A8 In the open, known as free field, sound attenuates at a rate of 6 dB per each doubling of distance. This is known as geometric spreading or sometimes referred to as the Inverse Square Law. As noise is measured on a Logarithmic scale, this attenuation in distance = $20 \log$ (ratio of distances), e.g. for a noise level of 60 dB at ten metres, the corresponding level at 160 metres is:

$$60 - 20 \log \frac{160}{10} = 60 - 24 = 36 \text{ dB.}$$

APPENDIX C

NOISE SURVEY RESULTS

Appendix C – Noise Survey Results

Label	L _{Aeq}	L _{Afmax}	L _{Afmin}	L _{Af10}	L _{Af90}
Mon - 15 : 03	51.1	70.0	47.4	52.8	49.0
Mon - 15 : 15	52.1	67.1	47.4	53.5	49.0
Mon - 15 : 30	52.4	66.4	45.7	54.2	47.8
Mon - 15 : 45	54.3	70.0	46.4	57.0	48.8
Mon - 16 : 00	54.7	69.4	47.3	57.6	48.3
Mon - 18 : 53	46.5	64.0	42.9	47.7	44.4
Mon - 19 : 00	47.0	63.1	41.5	48.7	43.6
Mon - 19 : 15	47.3	65.1	41.7	46.3	43.2
Mon - 19 : 30	49.5	66.5	41.6	51.2	44.2
Mon - 19 : 45	46.5	65.5	40.4	48.3	42.5
Mon - 20 : 00	48.0	69.3	40.3	48.3	42.3
Mon - 20 : 15	45.4	63.4	40.5	46.4	41.8
Mon - 20 : 30	52.4	73.9	40.2	51.4	41.9
Mon - 20 : 45	44.5	62.5	40.5	45.7	42.0
Mon - 21 : 00	43.0	50.2	40.7	44.0	41.5
Tue - 08 : 57	54.9	69.9	49	56.9	50.5
Tue - 09 : 00	55.2	71.5	48.1	56.7	50.3
Tue - 09 : 15	52.7	70.4	48.6	53.9	50
Tue - 09 : 30	52	69.3	47.7	53.3	49.6
Tue - 09 : 45	52.2	63	47.6	54	49.6
Tue - 10 : 00	51.2	61.4	47	52.7	49.2
Tue - 10 : 15	51.3	67.1	47	52.6	49.6
Tue - 10 : 30	52.8	57.8	49.5	54.3	50.7