

Acoustic assessment of installed mechanical services equipment

The Bear Hotel, Market Place, Devizes



Client: Roundstone Catering Equipment Limited

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CONTENTS

0. SUMMARY	1
1. INTRODUCTION	2
2. ACOUSTIC CRITERIA	2
3. REVIEW OF SITE LOCATION	3
4. SOUND LEVEL SURVEY	4
5. ACOUSTIC ASSESSMENT	5
6. CONCLUSION	6

0. SUMMARY

- 0.1. ACA Acoustics Limited has been commissioned to assess the acoustic impact of installed mechanical services equipment associated with a hotel kitchen at The Bear Hotel, Market Place, Devizes.
- 0.2. The assessment is required to demonstrate to the local authority that noise emissions from the equipment are not detrimental to the amenity of nearby noise-sensitive properties and complies with the Local Authority's requirements.
- 0.3. Based on Wiltshire Council's typical acoustic criteria, the rating level from the equipment should not exceed a sound level 5dB below the measured background sound level outside the most noise-sensitive receptor when assessed in accordance with the methodology of BS 4142:2014+A1:2019.
- 0.4. The most noise-sensitive residential receptor (NSR) has been assessed as rear windows of The Peppermill Hotel, St John's Street.
- 0.5. ACA Acoustics have undertaken a manned sound level survey of the installed equipment. Measured specific sound levels from the equipment were $\leq 32\text{dB}$, and measured background sound levels at the latest operating period of the equipment at 17:00 hours were LA90 42dB. The equipment was subjectively inaudible, and the rating sound level from the installed equipment is LAr $\leq 32\text{dB}$ when assessed in accordance with the requirements of BS 4142:2015+A1:2019. Measured rating levels from the equipment are at least 10dB below the measured LA90 background sound levels and meet the requirements of Wiltshire Council.
- 0.6. Noise from the equipment will not be disturbing or detrimental to the amenity of any nearby residential or other noise-sensitive receptors and complies with the planning requirements of Wiltshire Council.

1. INTRODUCTION

A new fan associated with a hotel kitchen has been installed at The Bear Hotel, Devizes.

ACA Acoustics Limited has been commissioned on behalf of the client to carry out an assessment of noise emissions from the installed mechanical plant to ensure the requirements of Wiltshire Council are being met and ensure that the amenity of nearby noise-sensitive properties is not compromised.

This report presents results of the sound level survey and assessment.

2. ACOUSTIC CRITERIA

Noise criteria used for this assessment is based on typical criteria issued by Wiltshire Council. Based on previous planning applications in the county it is understood that Wiltshire Council require that the rating level of the new mechanical plant should achieve a rating level at least 5dB below the representative background sound level when assessed in accordance with BS 4142:2014+A1:2019.

The assessment method of BS 4142:2014+A1:2019 corrects the specific sound level from the source under investigation to account for characteristics that could make the sound more intrusive to obtain a rating level. This rating level is compared against the prevailing background noise outside the noise-sensitive property. Section 11 of BS 4142:2014+A1:2019 provides a commentary of the assessment result and advises that:

- a) *The greater the difference between the rating level and the background sound level, the greater the magnitude of the impact.*
- b) *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) *A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.*
- d) *The lower the rating level is 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.*

A criterion of the rating level to be 5dB lower than the measured background sound level is more stringent than that recommended within the British standard and will ensure further protection of the nearest residential properties' amenity.

3. REVIEW OF SITE LOCATION

A new kitchen extract fan has been installed at The Bear Hotel, Devizes. The equipment is situated to the rear of the building and operates until 17:00.

The most noise-sensitive residential receptor (NSR) has been assessed as the rear windows of The Peppermill Hotel, St John's Street, the rear windows overlooking Castle Lane and are approximately 20 meters away from the proposed plant, indicated by the NSR1 label in Figure 1 below.

Receptor	Description
NSR1	Residential windows of The Peppermill Hotel, St John's Street.

Table 1: NSR Description

A marked-up photograph is included in Figure 1 identifying the location of the equipment and nearest residential windows.

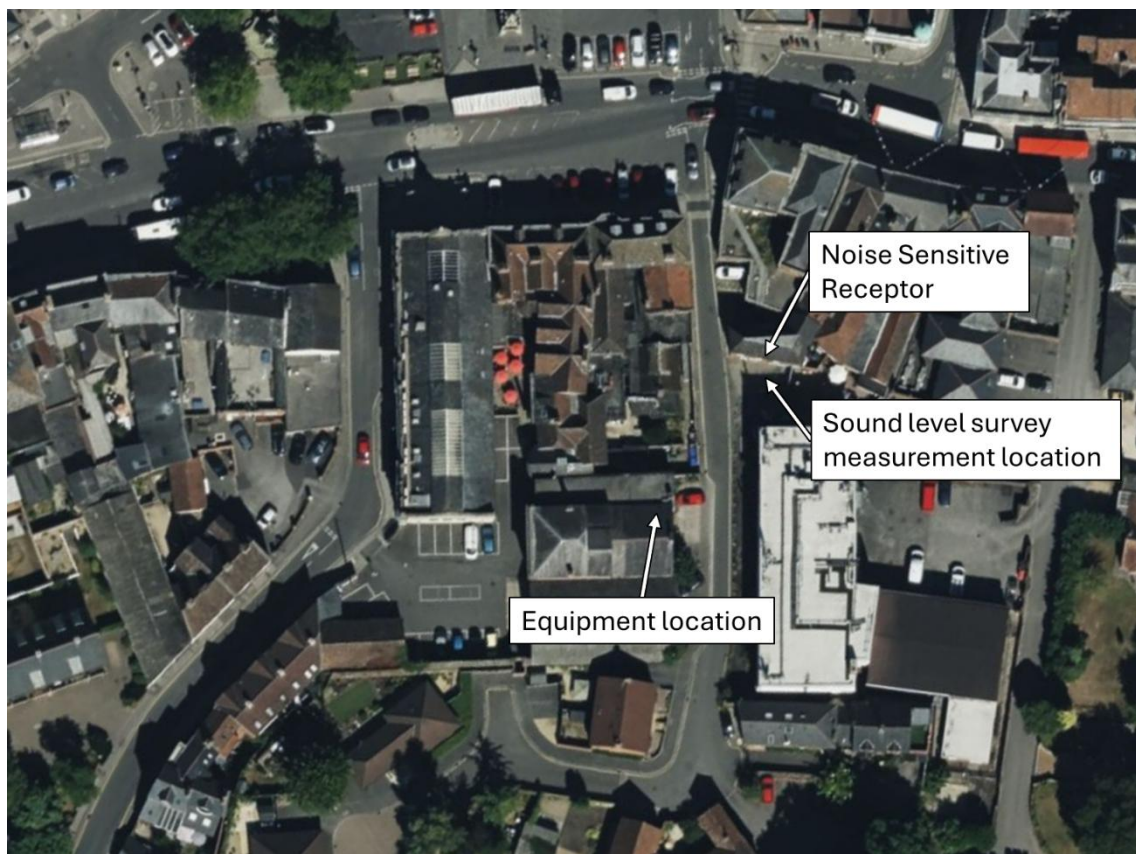


Figure 1: Equipment location, measurement position, and closest receptor (available at [google.com/maps](https://www.google.com/maps))

4. SOUND LEVEL SURVEY

To assess sound levels from the mechanical equipment, a manned sound level survey has been carried out during the latest operating period of the equipment.

The survey was conducted by Tommy Burn of ACA Acoustics during the afternoon of the 4th February 2026 to the latest operating times of the fan.

During ACA Acoustics' design survey as reported within ACA Acoustics' report reference 240402-R001, the unattended background survey was conducted at the development site due to access and security reasons. Within this subsequent commissioning survey a manned position at the nearest residential windows was used. This location is less screened and more representative of sound levels at the nearest residential windows, providing a more accurate assessment of the impact of the installed fan.

During the survey, the soundscape in the vicinity was influenced predominantly by local and distant road traffic. The following equipment was used during the survey. An on-site calibration check was conducted on the sound level meter prior to the survey and repeated after with no deviation noted.

Equipment.	Serial Number
NTi Audio Class 1 sound level meter type XL2-TA complete with weatherproof and lockable outdoor environmental kit	A2A-10964-E0
Svantek calibrator type SV33B. Compliant to IEC 60942-1:2017	83826

Table 2: Equipment used for the sound level survey

Weather conditions at the time of the survey were clear, cold, calm, and dry.

Measurements were obtained with the fan operating and then with it powered off.

Results of the survey are shown in Table 3 below.

Description	Measured Sound Levels	
	LAeq	LA90
Sound level with fan operating, measured at the nearest residential properties	49	42
Background sound level after the fan powered off at 17:00 hours	49	42

Table 3: Summary sound level survey results

The fan was operating continuously during the survey period while it was powered on, and as such it is appropriate to use the LA90 sound levels as most representative to determine the actual sound level of the unit while excluding intermittent traffic events from the busy road.

There was no change in the measured sound levels with the fan operating and switched off. This correlates with subjective opinion of ACA Acoustics' engineer; noise from the fan was completely inaudible at the closest noise-sensitive receptors

Assessment of specific sound levels of the fan to the nearest residential property is shown below. As there is no change to the measured residual sound level when the equipment powered on it is not possible to ascertain exact sound level however the specific noise is at least 10dB below the background level.

Description	Specific Sound Levels
Specific sound level of fan at nearest residential windows	≤32dB

Table 4: Specific sound level of the installed fan

5. ACOUSTIC ASSESSMENT

The results shown in Table 3 and summarised in Table 4 indicate that specific sound level from the installed plant is currently at least 10dB below the measure background sound level.

Assessment of the calculated rating levels in accordance with BS 4142:2014+A1:2019 is provided in Table 5 below.

Description	R1 Receptor	Relevant Clause	Commentary
Calculated specific sound level to receptor	LAeq <32dB	7.1 7.3.6	Equipment operating.
Background sound level	LA90 42dB	8.1.3 8.3	Measured representative background sound level.
Acoustic feature correction	0dB	9.2	While on site the installed equipment was subjectively inaudible at the nearest residential property and as such no acoustic correction is applicable.
Rating level	LAr <32dB	9.2	
Excess of rating level over background sound level	At least 10dB below the background LA90 sound level	11	Assessment indicates a low likelihood of adverse impact

Table 5: Assessment of results in accordance with BS 4142:2014+A1:2019

Table 5 shows the rating level of the equipment is at least 10dB below the background LA90 sound level to outside the closest noise-sensitive properties.

BS 4142:2014+A1:2019 requires an assessment to consider the context of the development, rather than simply adhering to numerical values.

In this instance, the installed plant is subjectively inaudible. While on site ACA Acoustics consultant spoke with a member of staff of The Peppercorn Hotel while stood outside and they agreed that the equipment was subjectively inaudible. This further reduces the likelihood of adverse impact.

6. CONCLUSION

ACA Acoustics have been commissioned to undertake an acoustic assessment of noise from a new extract fan to ensure it is meeting the requirements of Wiltshire Council.

ACA Acoustics have undertaken an assessment of noise from the installed equipment. The rating level is at least 10dB below the background sound level when assessed in accordance with the methodology of BS 4142:2014+A1:2019 at 1m from the closest noise-sensitive windows of the nearest residential receptors, achieving a “low likelihood of adverse impact”.

As a result the installed equipment achieves the Local Authority's planning requirements for this development.