

AVAL



Noise Impact Assessment

Site: Unit 5A, The Village, 19/23 King Street, Reading, RG1 2HG

Client

Mr. H Chatli

Version Control

Date: 25/03/2020

Report No: 639

Revision: C

Status: Final

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1. Introduction

1.1 Overview

Mr H. Chatli is seeking consent for change of use from a restaurant (Class A3) to mixed restaurant and shisha lounge use (Class A3/Sui Generis), with various external alterations at Unit 5A, The Village 19/23 King Street reading RG1 2HG (hereafter referred to as the 'proposed development').

AVAL Consulting Limited was instructed by the Client to produce a Noise Impact Assessment to accompany the planning application to Reading Borough Council for consent to undertake the proposed work.

The main purpose of this report is to carry out an assessment to determine if the noise impact from the operation of the commercial extraction and chiller units is likely to cause detriment to the nearby noise-sensitive receptors. The assessment also considered the impact of the outdoor shisha lounge.

1.2 Site Description

The site surroundings are predominantly commercial use in nature. There are no private residential uses within close proximity and the nearest potential sensitive users are considered to be the Ibis Hotel buildings (Figure 1.1).

The impact on the main Ibis Hotel building is considered to be negligible as the hotel is mechanically ventilated. There is no clear information about the previous use of the building located at the east of the proposed development.

In accordance with google imagery, the past updated image is from 2017 showing a sign on the building suggesting commercial use. There is no information within the planning portal can be found to confirm the current approved land use status for this building. Based on the last known use, we assumed the site use is commercial.

Following further checks, the planning department has found out that the building is part of Ibis hotel and likely to be used as overnight accommodation for employees.

However, it should be noted that there is no direct path for sound propagation from the sitting area towards the Ibis Hotel or the next-door staff building, as shown in Figure 1.2 and 1.3 below. Hence the impact of the proposed development is not considered significant on both Ibis Hotel buildings.

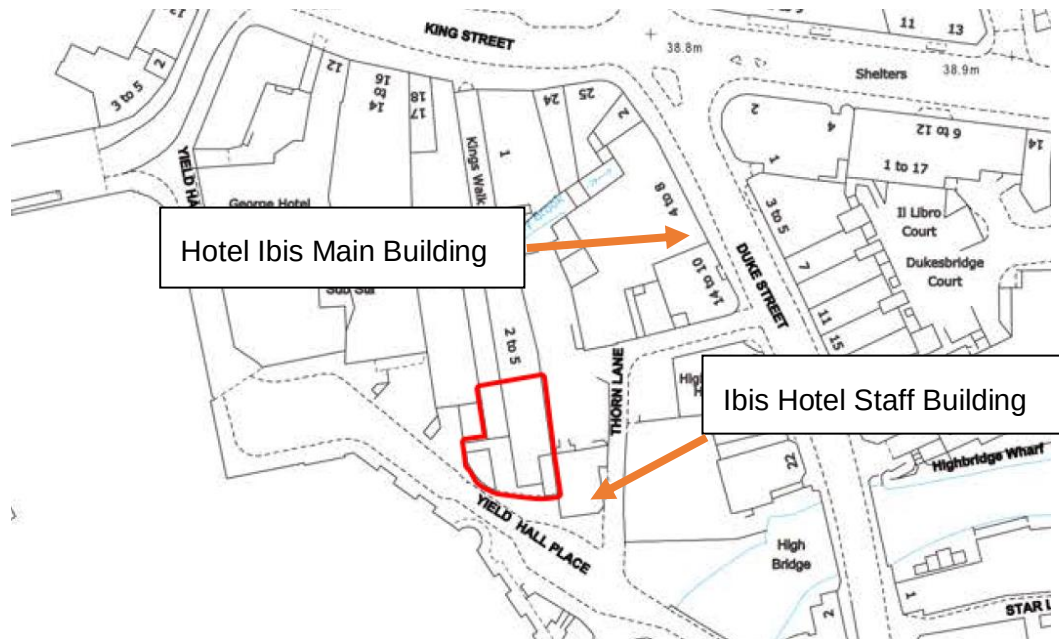


Figure 1.1: Site Location, Source: Extract from a Client Drawing

1.3 Development Proposal

The proposal is for both internal and external changes. The changes include the main restaurant sitting area to be reduced in terms of floor space, in order to accommodate more outdoor balcony sitting spaces.

The development benefits from existing planning permission for a kitchen extract system from previous restaurant use as shown in figure 1.2. No changes to the existing commercial kitchen extract system is proposed. It is understood that the kitchen extract is being serviced and maintained as per the manufacturer's guidance. Therefore, the impact of the kitchen extract system can be scoped out as there are no changes proposed.

There is no proposal for any live music events or loud outdoor music.

The remaining potential noise source is the increase in the outdoor sitting area, which has been considered further within this assessment.

Detail site drawings and plans are presented in Appendix B.

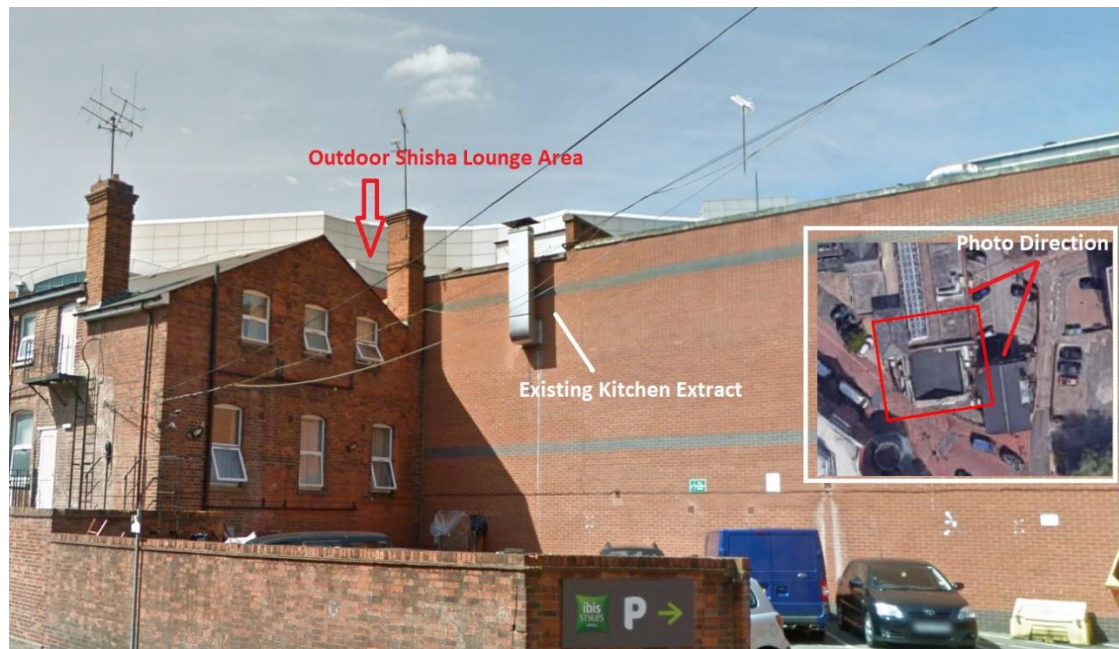


Figure 1.2: Existing Kitchen Extract

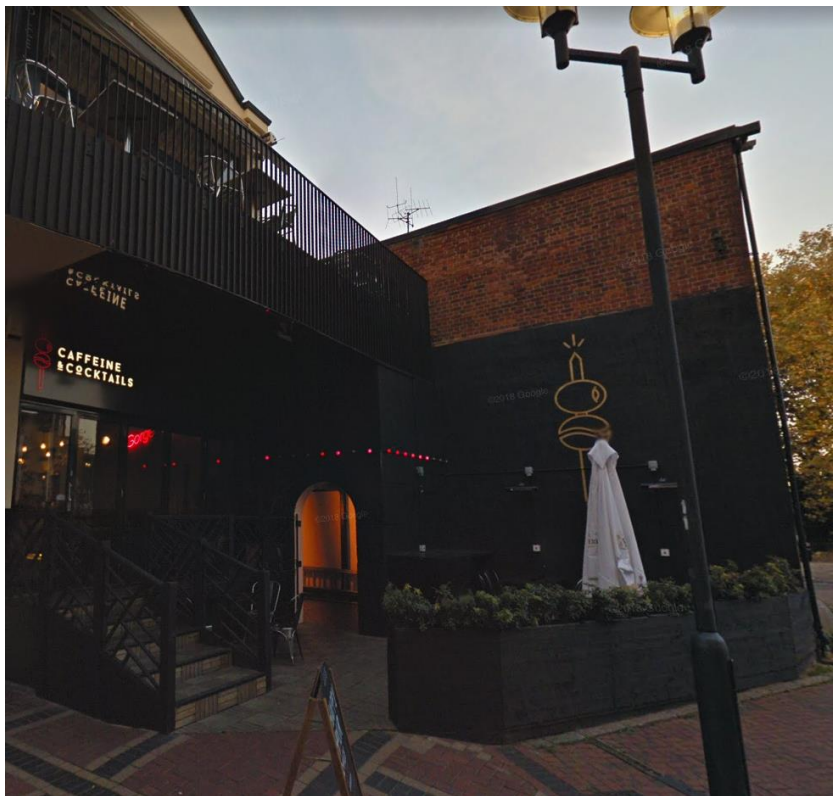


Figure 1.3: adjacent building with potentially residential uses by Ibis Hotel as staff accommodation

2. Applicable Evaluation for Noise Assessment

In terms of industrial/commercial development, guidance is set out in BS 4142: 2014+A1:2019, 'Methods for rating and assessing industrial and commercial sound'. BS 4142 requires the noise from the process/equipment (in LA_{eq}) to be compared with the background sound level (LA_{90}) in conjunction with the new noise source.

BS 4142 states that if the rated noise level exceeds the LA_{90} background sound level by around +10 dB or more, then it is likely that the resultant noise may have a significant adverse impact, a difference of around +5 dB over the background sound level is likely to have an adverse impact, and where the rating level does not exceed the background sound level it is an indication that the resultant noise is likely to have a low adverse impact.

BS 4142 : 2014 provides a method for assessing whether an industrial or commercial sound source (e.g. fixed mechanical plant) is likely to cause a disturbance to persons living near to the sound source.

The 2014 document introduces three main acoustic features:

Tonality: Defined as more sound in the 1/3 octave band than those nearby 1/3 octave bands or more sound in a given frequency than in those nearby frequencies. The tonality feature correction +6dB and can be applied using subjective method or an objective method using 1/3 octave bands.

Impulsivity: defined as sound that increases by a rate of at least 10dB per second, regardless of its duration. The impulsivity feature correction range from 0-9 dB and can be applied using a subjective method or an objective method using a sound level meter capable of sampling sound at either once every 0.01s interval or once every 0.025s interval.

Intermittency: Defined as sound that can be identified as being on/off during the measurement period in which case the correction factor that is applied to the specific sound source (e.g. fume extraction system) is +3 DB.

BS 4142 assesses potential significant effect by comparing the source noise (extractor duct vent noise) with the measured background noise level (LA_{90}). The standard provides a penalty (correction factor) for acoustic features for instance bangs or tonal qualities that can increase the likelihood of noise complaints and in these cases the standard requires a correction to be added to the source noise level. The source noise level along with the correction factor is referred to as the 'rating level'. The rating level is then compared with the background level (LA_{90}).

The following should be considered when evaluating the potential for rating value to cause disturbance to noise sensitive premises: To assess the impact of the new sources on the sensitive receptors a noise survey was conducted at the site as discussed in Section 5.

In addition to above, based on the Guidance of Control of Odour and Noise from Commercial Kitchen Exhaust Systems (2018), there are two fundamental categories of noise source are of relevance. The first is the noise produced by the fan, which is

a function of the type of fan (axial, centrifugal, mixed flow, etc), the rate of the airflow and the pressure drop. For these calculations the octave band sound power from the fan is required. This can normally be obtained from the manufacturer.

The second category of noise is generated by turbulence as the air passes within the ducts or through the exit grille or louvre. In this case the amount of noise is determined by the design of duct, grille or louvre, the pressure drop across terminations, the velocity of the air (this can be variable across the duct, grille or louvre) and the area of the duct or opening. The problem with this form of noise, especially at terminations, is that in most situations it can only be controlled at its source. For example, at the feature that is generating the noise as there is no further length of duct in which to install noise control equipment.

In some situations, a third source may need to be considered. This is where noise generated within the building breaks into the ductwork and is radiated from the outlet. The area of the duct walls, the acoustic properties of the duct walls and the area of any inlets determine the amount of break-in noise. Once this noise has broken into the ducts it can be treated as if it were an additional component of the fan noise. However, the nature of this additional noise is such that it usually contains a relatively high level of low frequency sound which can be difficult to attenuate.

The attenuation of fan noise (and break-in noise) provided by the ductwork is determined by the length of the ducts, the presence of any bends, changes in cross-section, the presence of any plenum chambers and termination effects (including sound-attenuating louvres if present and the attenuation provided by any change in cross-section). A balance has to be struck between the acoustic benefit of bends and louvres etc and the pressure drop that these create, possibly requiring a larger fan.

The sound energy components arising from fan noise, turbulence within the duct and at outlets, and from noise break-in, combine to produce an acoustic source at the outlet. The energy will then propagate away from the outlet in a manner determined by the nature and geometry of surrounding buildings and terrain. The nature, temporal characteristic and level of the resultant sound that reaches the ears of people in the vicinity (usually quantified by considering the noise at façades), and its level relative to the background noise, all contribute to its potential to cause disturbance and complaint. These factors should be taken into account at the planning stage as a matter of course. They form the basis of BS 4142 "Rating industrial noise affecting mixed residential and industrial areas" which is also used by Local Authority as support to the issue of a Noise Abatement Notice under the Environmental Protection Act.

3. Noise Surveys

3.1 Overview

This section provides the details of the methodological approach taken to assess the prevailing acoustic environment at the site where existing noise-sensitive receptors will be present. Establishing the current acoustic environment requires the monitoring of noise levels at the site and establishes the critical noise indicators namely $LA_{eq,T}$, $LA_{10,T}$, $LA_{90,T}$ and $LA_{max,T}$ as described in Appendix A.

3.2 Noise Monitoring

The noise monitoring was carried out for approximately 24h period from 08/01/2020 to 09/01/2020. The results are presented for the whole duration, for a typical 24 hour period, and day (16 hours from 07:00h to 23:00h) and for the night (8 hours from 23:00h to 07:00h).

The noise levels at the 15-minute interval were recorded using a Class 1 noise monitor- Make: Castle Sonus GA116L, which was calibrated before and after the surveys (last calibration date 7.12.2018). The location of the monitoring point is shown in Figure 3.1. It is considered that the location point highlighted in the map is likely to provide worst-case reading as this is the closest point to the existing sitting area. The noise monitor was placed just outside the existing building front entrance.



Figure 3.1 Location of noise monitoring (Source: Google)

The microphone of the sound level meter was located at the height of approximately 1.5m above ground level and in free-field conditions (3.5m from any wall). This measurement position was adopted as it was considered to be representative of the existing background noise climate. Noise sources at this location are predominantly found to be from road traffic and existing commercial uses.

3.3 Weather Conditions

The following climate conditions were recorded for the site:

Wind: Less than 3 m/s.

Humidity: The weather was cloudy

Temperature: 03-07 Degrees C.

Precipitation: light

The above weather conditions are suitable for the measurement of environmental noise in accordance with BS7445: Description and Measurement of Environmental Noise.

4. Noise Survey Results

Figure 4.1 shows a snap-shot of the time series of LAeq at the 15-minute interval for the survey period. This clearly shows the absence of any dominant noise source, and mainly indicates background noise emanating from traffic and commercial uses.

A summary of measured noise indicators is presented in Table 4-1. From the table, it can be seen that the minimum measured background noise level for Day time is LA90:16h 58 dB(A) and night time is 55 dB(A).

Table 4-1 Summary of noise indicators, all values are in dB (A)

Indicator	All Values	Day	Night
LAeq	65	63	59
LA90	60	58	55
LAmx	72	71	68

5. Noise Impact Assessment

As discussed above in section 1.3, the impact of commercial kitchen extract has been scoped out as no changes to the existing extract system is proposed.

The existing site uses currently includes outdoor sitting area as shown in figure 5.1.



Figure 5.1: Existing Outdoor Sitting Area

The new proposal is estimated to introduce approximately 20 more sitting spaces (conservative assumption). A typical sound pressure level at 1m for the normal vocal effort is considered to be 60 dB (A). Therefore, assuming all 20 additional spaces are occupied, the total noise from the speech will be 73 dB (A). Applying distance correction of 3.5m, the residual noise at the monitoring location will be 62 dB (A).

It should be noted that there is no window at the residential property facing the direction of the proposed development. There is no direct path for noise propagation. As a worst-case consideration, if we just consider the directivity of the noise propagation of minimum 30 degrees, a directivity factor of 2 dB can be applied. The resulting predicted noise level will be 60 dB (A) at worse. In reality, it should be lesser than 60 dB as there is no direct path for noise propagation to residential development.

Based on the BS4142 criteria, the resulting noise level is not predicted to exceed the background noise level by 10 dB(A) or more. Therefore, the impact is not considered significant.

Based on above, it can be concluded that the small alteration to the building design to introduce additional external balcony sitting area, will have negligible noise impact to nearby receptors.

No further mitigation measure is considered required.

6. Conclusions

This report provides an assessment of the potential noise impact during the operations phase of the development.

Based on the results presented in section 5, the residual noise impact is not considered significant.

It can, therefore, be concluded that the proposed development is not considered to conflict with any national, regional, or local planning policy in relation to operational phase noise impact on existing receptors.

Appendix A: Noise Indicators

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to approximate to the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third-octave band frequencies.

Reference Time Interval, T

The specified time interval over which an equivalent continuous A-weighted sound pressure level is determined.

$LA_{eq,T}$

The A-weighted equivalent continuous sound level. This is the sound level of a notionally steady sound having the same energy as the fluctuating sound over a specified measurement period, T.

$LA_{10,T}$

The A-weighted sound level exceeded for 10% of the specified measurement period, T.

LA_{max}

The highest short duration A-weighted sound level recorded during a noise event.

LA_{90} , or Background Noise Level,

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 % of a given time interval, T.

Appendix B: Drawings

Please see the planning portal for the most up to date submitted drawings