



LAND ADJACENT TO 362 OXFORD ROAD

READING

Environmental Noise Assessment for Planning
Application

Address

Land Adjacent to 362 Oxford
Road, Reading, Berkshire,
RG30 1AQ

For

UK Bauhaus Ltd
86-90 Paul Street, London,
EC2A 4NE

Office 8094, 321-323 High Road,
Chadwell Heath, Essex, RM6 6AX

www.redfansolutions.co.uk
info@redfansolutions.co.uk

Report Number 2526-912-20-09

Overview

Site Address: Land Adjacent to 362 Oxford Road, Reading, Berkshire, RG30
1AQ

Report no: 2526-912-20-09

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Authors: Andrew Hunt

Client: UK Bauhaus Ltd

Prepared by: REDFAN Solutions

www.redfansolutions.co.uk
info@redfansolutions.co.uk

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1. Introduction

- 1.1 REDFAN Solutions have been instructed to assess the background noise and impact on the proposed new development at Land Adjacent to 362 Oxford Road, Reading, Berkshire, RG30 1AQ.
- 1.2 Planning consent is being sought for the erection of a mixed-use development comprising of two commercial units on the ground floor, 26 residential units, associated landscaping, car and cycle parking.
- 1.3 A noise impact report and assessment will be part of the application for the Local Authority to demonstrate that the amenity of occupiers is not adversely affected by noise.
- 1.4 This report outlines the background noise levels at the site as well also provides any acoustic performance specifications that are required to enable the internal noise criteria to be achieved.
- 1.5 Monitoring of the prevailing background noise was undertaken over a 4-day period.

2. Criteria

- 2.1 Part 1 and 2 of BS 7445 establishes guidelines to quantities and procedures for environmental noise measurements and a Guide to the acquisition of data pertinent to land use. Guidance provided on instrumentation and calibration, measurement positions, meteorological effects, and information to be recorded.
 - 2.1.1 All equipment shall be calibrated and the configuration for calibration shall be in accordance with the manufacturer's instructions.
 - 2.1.2 A comprehensive recalibration at certain time intervals may be prescribed by authorities responsible for the use of measurement results.
 - 2.1.3 A field check shall be made by the user at least before and after each series of measurements, preferably including an acoustic check of the microphone.
 - 2.1.4 "Outdoor measurements near buildings": these measurements shall be carried out at places where the noise to which a receiver is exposed is of interest. If not otherwise specified, the preferred measurement positions are 1m to 2m from the façade and 1.2m to 1.5m above the ground.
 - 2.1.5 Measurements indoors. These measurements shall be carried out in enclosures where the noise is of interest. At least 1m away from walls and 1.2m to 1.5m above the ground.

2.2 Government guidelines for planning assessment is the National Planning Policy Framework (NPPF) which came into force in March 2012, in July 2018 and the National Planning Policy Guidance (NPPG). This was undated and in the main replaces previous PPG and PPS documentation.

2.3 The NPPF 2024 sets out the Government's economic, environmental and social planning policies for England and Paragraph 187-part e states,

"preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution.

Paragraph 198 part a states,

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;

2.4 BS 4142: 2014+A1:2019 "Method 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:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises;
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The significance of sound impact is to be determined according to the following summary process:

- Determine the background sound levels, in terms of the index LA90, at the receptor locations of interest.
- Determine the specific sound level of the source being assessed, in terms of its LAeqT level (T = 1 hour for day or 15 minutes for night), at the receptor location of interest.
- Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
- Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.
- A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the 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.

2.5 BS 4142 introduced the concept of 'context' to the process of identifying noise impact. Section 11 of BS 4142: 2014+A1:2019 explains "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 source exceeds the background sound level and the context in which the sound occurs" (our emphasis). An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context" (our emphasis).

There are many context points to consider when undertaking an assessment of sound impact including:

- The absolute level of sound;
- The character and level of the specific sound in the context of the existing noise climate; for example, is the sound to occur in a location already characterised by similar activities as those proposed?
- The sensitivity of the receptors;
- The time and duration that the specific sound is to occur;
- The conclusions of assessments undertaken using alternative assessment methods, for example, WHO guidelines noise values or change in noise level;

2.6 BS4142:2014+A1:2019 notes that:

"Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact." BS4142:2014+A1:2019 outlines

guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

To account for the acoustic character of proposed sound sources, BS4142:2014+A1:2019 provides the following with respect to the application of penalties to account for *“the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention”*.

- **Tonality** – *“For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible;*
- **Impulsivity** – *A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible;*
- **Intermittency** – *When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied; and*
- **Other Sound Characteristics** – *Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.”*

2.7 It is therefore entirely possible that whilst the numerical outcome of a BS 4142: 2014+A1:2019 assessment is indicative of adverse or significant adverse impact, when the proposal is considered in context the significance of the impact is reduced to an acceptable level.

2.8 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 1: Noise Exposure Hierarchy Perception Examples

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Noticeable and Intrusive	No Effect	No Observed Effect	No specific measures required

No Observed Adverse Effect Level			
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 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.	Significant Observed Adverse Effect	Avoid
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	Adverse Effect Prevent

2.9 In March 2010 the Department for Environment, Food and Rural Affairs (DEFRA) produced "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."

2.10 The "Noise Policy Statement for England", (NPPF) and (NPPG) state that no significant adverse impact should occur through development, but where noise levels fall between a 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."

2.11 BS8233:2014 Local Authorities usually stipulate internal noise criteria for new build residential uses based on British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'.

2.12 BS 8233:2014 provides references and guideline values for desirable indoor ambient noise levels for dwellings as shown in Table 2.9 below.

2.13 BS 8233:2014 Desirable Internal Ambient Noise Levels for Dwellings

Table 4 Indoor ambient noise levels for dwellings

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

2.14 The table is noted to apply to external noise as it affects the internal acoustic environment from sources without a specific character.

2.15 The above internal ambient noise levels are therefore considered appropriate within this assessment.

2.16 BS 8233:2014 states that 'for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed an upper guideline value of 55dB L_{Aeq} , which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances...in higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited'.

2.17 The following table summarises the response to changes in noise level (known as the Semantic Scale).

Table 2: Change in noise level – response and impact.

Change in noise level LAeqT dB	Response	Impact
<3	Imperceptible	None
3 – 5	Perceptible	Slight
6 – 10	Up to a doubling	Significant
11 – 15	More than a doubling	Substantial
> 15	-	Severe

2.18 For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB LAmax more than 10–15 times per night.

2.19 WHO Guidelines for Community Noise

2.19.1 The WHO Guidelines (1999) recommends indoor nighttime guidelines in order to avoid sleep disturbance, the document states these to be 30dB (LAeq) and 45dB (LAfmax) for continuous and individual noise events respectively.

2.19.2 The document states that the number of noise events should also be considered and that individual noise events should not exceed 45dB (LAfmax) more than 10 – 15 times per night.

2.20 The development is located within the administrative boundaries of Bristol City Council, the following documents make up the core policies with regards to noise and vibration:

2.21 The unattended survey was performed between 09:00 on 11/09/2025 to 16:00 on 14/09/2025.

Approved Document E (2003) Resistance to The Passage of Sound [Ade]

2.22 The table below presents the minimum sound insulation values as set out in ADE for purpose build residential flats.

2.23 Party walls and floors between the flats in the proposed development should achieve these performance standards.

Test Type	Location	Approved Document E 2003 Criteria
Airborne Sound Insulation	Wall	$D_{nT,w} + C_{tr} \geq 45 \text{ dB}$
	Floor	$D_{nT,w} + C_{tr} \geq 45 \text{ dB}$
Impact Sound Insulation	Floor	$L_{nT,w} \leq 62 \text{ dB}$

Higher values of $D_{nT,w} + C_{tr}$ represent better airborne sound insulation.

Lower values of $L_{nT,w}$ represent better impact sound insulation

3. Site Description and Observations

- 3.1 The proposed construction area hereafter referred to as 'the site', is a proposed development for 26 flat mixed-use development incorporating flexible commercial workspace at ground level.
- 3.2 The development is mainly surrounded by residential properties and is situated to the west of the main centre of Reading. This part of the A329 itself is a busy main road through from the city centre to the outskirts of the city. This area includes shops and eateries at ground level with residential flats above. There is a supermarket and small commercial area adjacent to the west of the site.

Noise Sources

- 3.3 The noise survey was unmanned; therefore, a subjective assessment of background and ambient noise sources could not be undertaken for the whole monitoring duration. While onsite the dominant noise source was road traffic and noise deriving from shops and other commercial facilities nearby. Secondary noise was from birds and the general hum associated with cities.
- 3.4 Red lines outline approximate site and survey position.



Main Noise Sources

- 3.5 The A3294 "Oxford Road" runs 35m to the south of the site, this anonymous transportation noise from the road was audible throughout the setting up and dismantling of the equipment and it is considered as the dominant noise.

- 3.6 There is a large Tesco supermarket next to the site. However, the entrance and main carpark is opposite the development with the supermarket itself obscuring most noise developing from the movement of cars, opening and closing of car doors and the general acoustic environment associated with the front of large supermarkets. The main impact from the supermarket is the condensing plant equipment situated on the roof of the building which is approximately 85m from the development. The units are housed within a barriered enclosure without a roof.
- 3.7 From previous surveys performed by REDFAN Solutions of gas cooler units and condensers from supermarkets of this size noise levels have been evaluated to be (L_{Aeq}) 15mins of 64dB @ 4m. This figure includes a 6dB BS 4142: 2014+A1:2019 tonal correction.

Calculated sound pressure	Character correction BS4142	Barrier attenuation	Calculated sound pressure at development façade (85m)	Difference to record site levels dB
64dB @4m	Included	-10dB	27dB(A)	-18dB

- 3.8 There are some restaurants and takeaways next to the site at ground level as part of Cholsey House, none of the current takeaways are late night takeaways, extraction was not visible site side of Cholsey House and there are residential properties above these takeaways so it is assumed that there is either no extraction or that they vent on the opposite side of the building and will not have the potential to effect the development adversely.
- 3.9 There are late night takeaways on Oxford Road itself with the nearest being Farmhouse Pizza but there are then a further three late night takeaways within a further 40m of there. Given that these restaurants are out of the centre of the city and have large enough interiors to completely accommodate their patrons it is unlikely given the distance and the position to the site there will be any impact from these establishments.
- 3.10 The White Eagle pub is 30m from the site with a small rear garden. The pub is a food led pub with some sports and events televised, the pub does not play music externally or have live music events, the garden will be fully screened from the development and given the style of establishment and proximity to the site will not adversely affect the development acoustically.

Potential Noise

- 3.11 Potential other noise sources: -

- Train Line - the train line runs approximately 460m north of the site and will not acoustically impact the site.

- There are no industrial areas or businesses within a distance considered to impact the development acoustically.

4. Environmental Noise Survey

4.1 The unattended survey was undertaken between 09:00 on 11/09/2025 to 16:00 on 14/09/2025.

4.2 Ambient (L_{Aeq}), (L_{A90}), (L_{cfMax}) and (L_{cfMax}) level measurements were taken for a continuous 1-hour period in 5- and 15-minute increments.

4.3 The recordings were taken in 5 minute and 15-minute intervals to prevent any other single noises that would be seen as not representational from affecting the measurements. Prior knowledge of any out of the ordinary potential noise was limited and could have had an impact on the test.

4.4 The sound level meter was positioned as for an outdoor free field measurement. The microphone was between 1.2m to 1.5m above the ground. The positions were chosen to best represent the ambient noise environment.

4.5 Equipment used for the survey.

Item	Make/Model	Serial No	Calibration Cert No
Calibrator	Norsonic 1255	125526735	U48992
Sound Level Meter	Norsonic 140	1404520	U48312
Microphone	Norsonic 1211-C	14141	48315

4.6 Measurements were made following procedures in BS7445:1991 (ISO1966-2:1987) Description and Measurement of Environmental Noise Part 2- Acquisition of data pertinent to land use and BS4142:2014 Method for rating and assessing industrial and commercial sound.

4.7 The weather during the survey was generally dry with light winds, which made the conditions suitable for the measurement of environmental noise. Wind had no set direction throughout the test and speeds did not exceed ($<5\text{m/s}$), cloud cover varied throughout testing.

4.8 The noise monitoring equipment used was calibrated before and after both the noise survey periods. No significant drift was recorded for either. Equipment calibration certificates can be provided upon request.

5. Uncertainty

5.1 All measurements onsite were taken with a sound level meter manufacturer's margin of uncertainty at typically $\pm 1.1\text{dB}$. It is due to the tolerances associated with Class 1 sound level meters and calibrator equipment used to measure background noise.

6. Results

6.1 The section below gives the Baseline Noise Survey readings taken at site.

Date	Time Period	Sound Pressure Level dB (L_{Aeq})	Sound Pressure Level dB (L_{90})
11/09/25	Daytime (07:00-19:00hrs)	53dB	48dB
	Evening (19:00-23:00hrs)	46dB	42dB
	Nighttime (23:00-07:00hrs)	44dB	38dB
12/09/25	Daytime (07:00-19:00hrs)	53dB	48dB
	Evening (19:00-23:00hrs)	55dB	44dB
	Nighttime (23:00-07:00hrs)	46dB	38dB
13/09/25	Daytime (07:00-19:00hrs)	54dB	46dB
	Evening (19:00-23:00hrs)	56dB	40dB
	Nighttime (23:00-07:00hrs)	45dB	37dB
14/09/25	Daytime (07:00-19:00hrs)	54dB	50dB

6.2 This table gives a averaged final single figure decibel rating at the site.

Date	Time Period	Sound Pressure Level dB (L_{Aeq})	Sound Pressure Level dB (L_{90})
11/09/25- 14/09/25	Daytime (07:00-19:00hrs)	54dB	48dB
	Evening (19:00-23:00hrs)	52dB	42dB
	Nighttime (23:00-07:00hrs)	45dB	38dB

6.3 The average ambient (L_{Aeq}) noise levels at the measurement position during the survey has been based on an analysis of the monitored data.

6.4 The table below shows the L_{Amax} level which has been exceeded more than 10 times in a nighttime period.

Position	Time Period	L_{Amax}
POS 1	Nighttime (23:00-07:00hrs)	71dB

7. Building Fabric Performance

7.1 The following design review is based on the architectural drawings for the proposed construction and targets the internal noise levels set out in section 2.

7.2 Proposed Plan



7.3 The minimum for all non-glazed elements, i.e. façade walls and the roof systems for the development will be required to provide the following minimum sound insulation performance, if tested in accordance with ISO 10140-2:2010.

Element	Rw
Double skinned external brick, plastered	55-58dB

7.4 The acoustic performance requirements for glazing of the noise-sensitive rooms are given in the table below, based on the monitoring data and predicted facade levels.

Façade/Room	Minimum single figure weighted sound reduction figure
Facing bedrooms	26dB
Facing living rooms	23dB

7.5 It is important that the quoted minimum sound reduction specifications are met by the panels and windows, including frames, seals, etc. Glass performance alone is not an acceptable means of demonstrating compliance with the specification for window performance.

7.6 Below is window make up and their attenuation.

Unit make up	Rw	Ctr	C
4/20/4	33 dB	28 dB	29 dB
6/16/6	33 dB	28 dB	32 dB
6/12/10	37 dB	34 dB	36 dB
6/16/6.4	33 dB	28 dB	32 dB
6/16/6.8A	39 dB	33 dB	37 dB

*Based on Pilkington Glass Laboratory testing

External Areas

7.7 There are balconies as part of the development which are at first floor level and higher. The levels recorded are at the upper end of the desired levels but are still within the recommended levels by WHO and BS 8233:2014 therefore there will be no need for any mitigation.

Ventilation and Overheating

7.8 Residential properties must comply with approved document F Ventilation, there are three main systems used;

1. Natural Ventilation
2. Continuous Mechanical Extract Ventilation
3. Mechanical Extract Ventilation with Heat Recovery

7.9 All types of ventilation are acoustically able to be considered for this construction however, specific acoustic trickle vents with a single figure attenuation of 26dB will be required to ensure compliance with BS 8233:2014 internal noise levels.

Approved Document 0: Overheating

7.10 The ANC (Acoustics & Noise Consultants) and IOA (institute of acoustics) have produced the Acoustics Ventilation and Overheating Residential Design Guide. This Guide is approved by the Government.

7.11 This Acoustics, Ventilation and Overheating Guide ('AVO Guide') is intended to be used by acoustic practitioners as well as all those involved in the planning, development, design and commissioning of new dwellings. It recommends an approach to acoustic assessments for new residential development that take due regard of the interdependence of provisions for acoustics, ventilation, and overheating.

- 7.12 Overheating mitigation takes into account if windows are likely to be closed during sleeping hours (11pm to 7am).
- 7.13 The ANC guidance is that windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:
- a. 40 dB LAeq,T, averaged over 8 hours (between 11pm and 7am).
 - b. 55 dB LAFmax, more than 10 times a night (between 11pm and 7am).
- 7.14 The assessment determines if acoustically, nighttime noise levels are achieved with partially open windows to mitigate summertime overheating.
- 7.15 Partially opened windows have a recognised typical 9dB attenuation. The assessment takes into consideration the measured environmental noise levels with the 9dB and the BS8233:2014 internal bedroom noise level guidance.
- 7.16 The assessed levels predict that the internal noise levels of both Leq and LAFmax will be in excess of the approved Document O criteria.
- 7.17 Partially opened windows to mitigate summer overheating during the nighttime will not be permissible and alternative overheating mitigation will be required.
- 7.18 Purge ventilation, also known as rapid or boost ventilation, is a method of rapidly exchanging air in a room to remove stale air, odours, and pollutants, often achieved by opening windows. On this basis, windows being opened for short periods of time is acceptable.
- 7.19 Mechanical ventilation strategy using localised MVHR units is proposed to achieve background ventilation requirements. Attenuator specifications for localised MVHR intake/exhaust openings will need to be provided during the design stage.

8. Commercial Spaces

- 8.1 The development is incorporating both commercial and residential spaces.
- 8.2 Interest in the commercial space has been from coffee shops and convenience stores (Class E).
- 8.3 In order to ensure the noise emissions from the proposed development do not cause an adverse impact on the surrounding residential NSRs, the noise breaking out from the Proposed Development must be assessed.

Cafe

8.4 Internal Noise Levels

The following table presents the sound level measured from a similar establishment. The 1-hour measurement was conducted in the centre of a ground floor café. The measurement included people talking, babies crying, low background music and noise from the preparation of beverages.

Description	L _{Aeq,t} (dB)
Internal Café Noise Level	71.0

8.5 Noise Breakout Analysis

The level of noise breaking out of the building has been calculated assuming the following criteria:-

- A partially open window provides approximately 15dB of sound reduction.
- 2m from the closest window of NSR1. The distance correction is calculated assuming the formula: $20 \cdot \log(r_1/r_2)$.
- There is a -6.0 dB difference between internal reverberant conditions and external nonreverberant conditions.

Description	dB
Internal Noise Level	71
Sound Reduction of glazed areas	-25
Internal to External Correction	-6
Distance to NSR (m)	-2
BS4142 penalty	5
Noise Level at NSR	39dB

8.6 Increase in Ambient Noise Level Assessment

The following section assesses the expected increase in ambient noise levels of the area due to the noise breaking out of the café.

The specific noise levels at the NSR are logarithmically added to the average measured ambient noise levels measured.

IANL Assessment	
Description	NSR (dBA)
Predicted Noise Level at NSR	39
Ambient Noise Level	54 (daytime)
Resulting Noise Level	54
Increase in Noise Level	0.1
IEMA Effect Descriptor	'Not Significant'

Discussion

8.7 The assessment of the internal breakout noise above shows that the increase in ambient noise level at the worst affected NSR is predicted to be 'Not Significant' when assessed in accordance with the IEMA Guidelines on Noise Impact. This equates to 'No Observed Effect Level' (NOEL) when assessed in accordance with the NPSE and NPPF.

Convenience Store

8.8 Typically, convenience stores will not have a higher breakout noise than cafes therefore the café assessment of breakout noise is considered robust.

8.9 The plant noise is based on convenience stores such as Co-Op or Tesco Express which will have the most external plant equipment.

8.10 Plant noise associated with convenience stores are likely to have the main noise impact source to the nearest noise sensitive receptors.

8.11 Most modern convenience stores use gas coolers and air conditioning units, for a space proposed this would most likely be a single Packaged ECO2 Mini CO2 Gas Cooler and 3 air conditioning units. All modern plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems.

8.12 The predictions have been based on the AC and refrigeration plant operating at full capacity during the daytime. Only the refrigeration units have been considered during the night-time period.

8.13 Calculation.

Calculation step	Day	Night
Source level	68Lp	63Lp
Distance correction (2m)	-6	-6
Rating Level at residential façade - LAeq	62dB(A)	57dB(A)
Limit of noise	38dB	28dB
Difference	+24dB	+29dB
BS4142 Assessment	Severe impact	Severe impact

Discussion

8.14 The noise level predictions demonstrate that cumulative noise emissions from the Theoretical plant assessment will have a severe impact at the façade of the nearest noise sensitive receptors.

8.15 It is advised that if plant equipment of this type is required for a convenience store a plant room is constructed with the following mitigation measures:

- Suitable atmospheric-side attenuators fitted to plant room apertures.
- Suitable acoustic ceiling installed within plant room.
- All plant and associated ductwork/pipework to be fitted with suitable anti-vibration mounts.
- Acoustic louvres with suitable attenuation levels to all required openings.

Single air conditioning units

8.16 Single air conditioning units for cafes or offices of the commercial size spaces have a sound pressure of approximately 49dB(A) @1m (Mitsubishi MSZ range).

Calculation step	Day	Night
Source level	49dB(A)	49dB(A)
Distance correction (2m)	-6	-6
Character tonality penalty	+3	+3
Rating Level at residential façade - LAeq	46dB(A)	46dB(A)
Limit of noise	38dB	28dB
Difference	+8dB	+18dB
BS4142 Assessment	Significant impact	Substantial impact

Discussion

8.17 The noise level predictions demonstrate that noise emissions from a single air conditioning unit will have a significant (daytime) and substantial (nighttime) impact at the façade of the nearest noise sensitive receptors.

8.18 Units of this type should be installed within acoustic enclosures if operating 24hrs.

8.19 Mitigation strategies such as screens, plant positioning, housing and attenuators can be used when assessing the installation of plant equipment however any plant equipment installed should comply with the below table in line with BS 4142: 2014+A1:2019 "Method for rating and assessing industrial and commercial sound" guidelines in relation to the levels of noise associated with external plant equipment.

8.20 In line with Reading Council EN17 policy the limit of noise should be no louder than 10dB above background (L90) noise.

Parameter	Daytime (07:00-23:00hrs)	Nighttime (23:00-07:00hrs)
Background - (LA90) 15min	48dB	38dB
-10dB below background	-10dB	-10dB
Limit sound level - LAeq	38dB	28dB

Separating Floor

8.21 The separation of the commercial space from the residential space is recommended to achieve an enhancement above the building regulations minimum levels. Particular attention should be given to construction makeup of areas that are considered noisy.

Typical Class E Operational Noise Levels

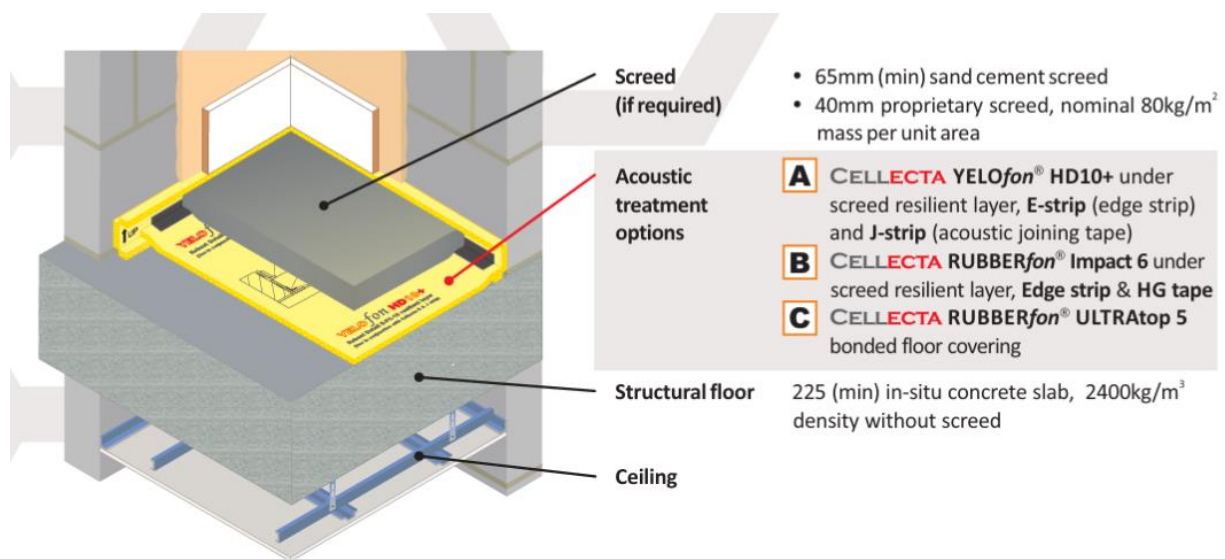
8.22 Restaurants and café operational noise levels of 71dB(A) is considered typical of likely noise from the proposed commercial space.

8.23 A proposed 55dB DnTw+Ctr for airborne sound insulation attenuation.

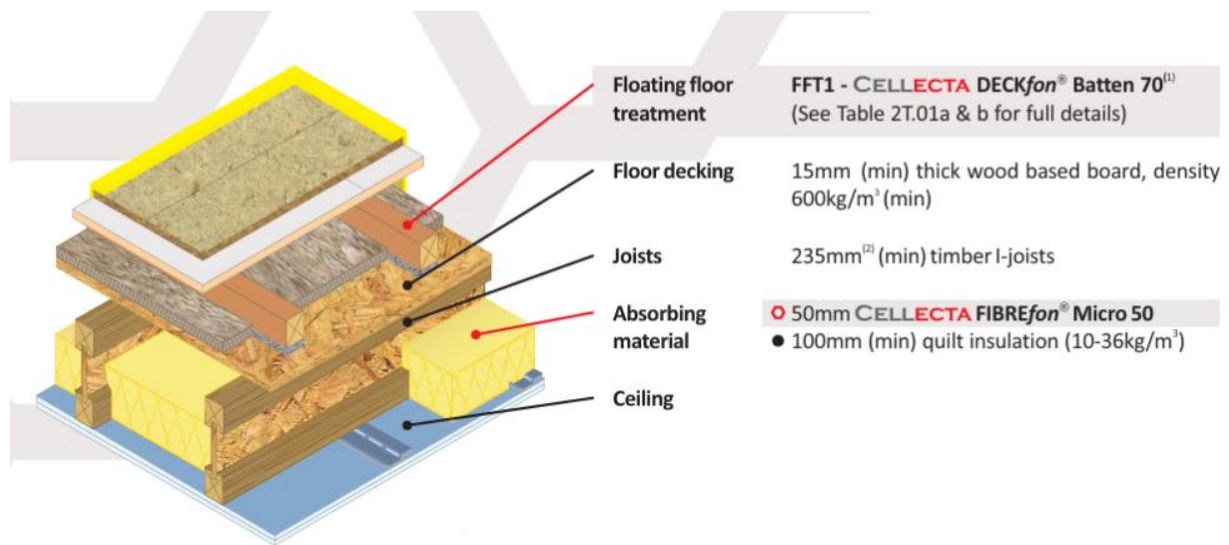
Floor Construction

8.24 Exact construction types vary however, using typical operational levels of 71dB(A), the makeups below will have a maximum internal equivalent noise level within the dwelling expected to be 22dBA LAeq(T) from noise transferred from commercial space.

In-situ concrete slab



Timber Beam



9. Conclusion

- 9.1 Measurements have been made of the prevailing noise climate at the Land Adjacent to 362 Oxford Road, Reading, Berkshire, RG30 1AQ.
- 9.2 The assessment outlined national and local guidance and considers this in relation to the likely operational activity and use of the building and in compliance with BS8233:2014, BS 4142: 2014+A1:2019 & BS 7445.
- 9.3 The surveyed and predicted noise levels have been assessed to determine the minimum sound reduction requirements of the external building façade elements to achieve suitable internal noise levels based on the requirements of BS8233:2014.
- 9.4 Mitigation measures including attenuation levels for glazed building elements and trickle vents.
- 9.5 An industrial noise assessment in line with BS 4142: 2014+A1:2019 has been used to assess the industrial noise potentially generated from sources local to the site. The assessment has concluded that the specified mitigation of building façade and glazing from the anonymous environmental noise is strong enough and no extra attenuation is required for the industrial noise produced to achieve internal noise levels outlined in BS8233:2014.
- 9.6 An assessment of possible plant equipment associated with the proposed commercial spaces has concluded that mitigation is required in order to achieve Reading council EN17 policy of external plant noise being not louder than 10dB above background noise.

- 9.7 Approved Document O assessment has concluded that opening windows cannot be used to mitigate summertime overheating during the nighttime therefore mechanical ventilation will be required.
- 9.8 It is proposed that a full property MVHR system be used to achieve the ventilation and overheating standards required. All systems should be fit for purpose and be installed and commissioned by professionals.
- 9.9 With MVHR installed and windows closed, compliance with BS 8233:2014 will be achieved.
- 9.10 MVHR internal noise levels within properties should be in line with those levels outlined of 35dB daytime in habitable rooms and 30dB at night with the aim for 25dB(A) in bedrooms at night to ensure an inaudible system.
- 9.11 A review of the proposed internal building fabric was carried out with reference to Approved Document E (2003).
- 9.12 Given the assessment undertaken, it is considered that a good level of residential amenity will be provided for residents and that the noise impacts associated with the development can be controlled to acceptable level now and in the future.



Andrew Hunt
TechIOA

Appendices

1. These are the main noise indices in use in the UK.

- dB(A): The human ear does not hear all frequencies with the same intensity. It is most sensitive to sounds in the 500Hz-8kHz range. Above and below this range the ear becomes progressively less sensitive. To compensate for this, sound level meters incorporate electronic filtering to correspond with the varying sensitivity of the ear. This filtering is called A-weighting and Sound Pressure Levels obtained with this weighting are referred to as A-weighted and signified as dB(A).
- LA90: The sound level (in dBA) exceeded for 90% of the time. This unit gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background noise level" of an area.
- LAeq,T: The equivalent continuous sound pressure level over a period of time, T; (in dBA) This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the varying noise in question". 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 road traffic, aircraft and trains.
- LA1: The sound pressure level (in dBA) exceeded for 1% of the time. This unit can give an indication of a regular maximum noise level from such activities as dance music.
- LAe: The sound exposure level, (previously denoted SEL) is the noise level of an event, such as a train or aircraft event, normally expressed in a 1 second time period.
- LAmin: The minimum sound pressure level (in dBA) measured over the time period.
- LAmax: The maximum level of sound (in dBA), i.e. the peak 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.
- LArT: sound rating level, the a-weighted, leq sound level of an industrial noise during a specified time period, adjusted for tonal character and impulsiveness.

POS 1

	LAeq	LAF,Perc6
09:00	57.2	50.2
09:15	53.4	56.7
09:30	58	48.5
09:45	47.9	46.6
10:00	39.1	46.9
10:15	41.5	47
10:30	38.7	46.6
10:45	43.8	47
11:00	53.1	52.9
11:15	51.7	55
11:30	53.4	56.1
11:45	55.6	59.6
12:00	55	56.5
12:15	54.9	54.3
12:30	46.8	47.7
12:45	39.4	46.7
13:00	39.7	47.2
13:15	54.6	44.9
13:30	53.8	49.8
13:45	51	48.5
14:00	56.5	33.5
14:15	47	28.6
14:30	44.4	31.5
14:45	57.5	47.8
15:00	62.6	62.6
15:15	60.7	55.8
15:30	53	54
15:45	55.1	54
16:00	51.2	53.6
16:15	50	54.8
16:30	56.3	51.1
16:45	43.3	50.5
17:00	41.8	50.4
17:15	41.4	46.3
17:30	54.3	46.2
17:45	48.5	45.5
18:00	50	45.5
18:15	50	46.9
18:30	49.3	46.1
18:45	48.2	45.2
19:00	48.4	45.8
19:15	48.8	45.6

19:30	48.2	43.8
19:45	46.4	43.5
20:00	46.4	43.6
20:15	48.4	44.2
20:30	47.6	44.4
20:45	45.5	43.1
21:00	46.4	43.2
21:15	47.1	43
21:30	45	42
21:45	45.4	42.3
22:00	45.6	42.2
22:15	45.2	41.9
22:30	45.1	41.2
22:45	46.1	42.1
23:00	45.5	41.4
23:15	45	40.9
23:30	43.8	39.8
23:45	44.9	39.1
00:00	43.8	38.2
00:15	45.1	37.8
00:30	43.1	37.4
00:45	44.9	38.2
01:00	45.6	38.7
01:15	42.5	36.6
01:30	42.6	35.7
01:45	40.5	35
02:00	42.6	34.6
02:15	44.6	36.7
02:30	43.4	36.8
02:45	43.2	36.2
03:00	41.7	35.4
03:15	40	34.2
03:30	40.9	34.6
03:45	43	36.9
04:00	40.7	35.9
04:15	42.6	37.1
04:30	42.2	36.5
04:45	44.9	37.5
05:00	42.3	37.2
05:15	45.7	40
05:30	45.9	40.8
05:45	46.7	41.3
06:00	47.1	42
06:15	49.2	43.6

06:30	48.7	44.7
06:45	50.2	44.7
07:00	49.6	45.1
07:15	49.1	45.6
07:30	48.5	45
07:45	48.5	45.6
08:00	48	45.2
08:15	50.6	46.4
08:30	51.9	50.4
08:45	51.9	50.4
09:00	51.5	50
09:15	53.5	50.4
09:30	53.3	50.4
09:45	52	50.1
10:00	51.3	49.8
10:15	51.4	49.6
10:30	53.3	49.9
10:45	52	49.9
11:00	52.8	50.4
11:15	53.5	50.2
11:30	51.3	50.1
11:45	51.6	50.2
12:00	54.9	50.8
12:15	52.7	50.7
12:30	52.7	50.3
12:45	52.6	50.8
13:00	52.6	51
13:15	53.9	50.5
13:30	51.8	50.3
13:45	52.5	50.2
14:00	52.5	50
14:15	56.1	49.7
14:30	51.2	50.1
14:45	55.2	50.3
15:00	53	24.6
15:15	55	37.8
15:30	53.3	32.9
15:45	47.7	32
16:00	40.6	33
16:15	55.1	34.5
16:30	58.9	38
16:45	54.6	33.6
17:00	54.7	35.3
17:15	43.3	35.4

17:30	55.8	37.7
17:45	53.2	43.5
18:00	52.8	42.2
18:15	51.6	43.6
18:30	51	39
18:45	53	40.8
19:00	53.5	35.8
19:15	54	37
19:30	56.1	36.8
19:45	55.1	33.7
20:00	55	63.1
20:15	55.1	62.3
20:30	57.2	68.9
20:45	57.7	70
21:00	57.6	68.6
21:15	59	69
21:30	58.9	68.9
21:45	64.4	28.4
22:00	53	42
22:15	50	27.3
22:30	48.4	25.5
22:45	43.7	25.9
23:00	49.2	25.7
23:15	42.7	25.2
23:30	52.1	25.3
23:45	43	25.7
00:00	46.4	39.1
00:15	44.4	38.7
00:30	46.2	39.5
00:45	46.9	40
01:00	43.8	37.9
01:15	43.9	37
01:30	41.8	36.3
01:45	43.9	35.9
02:00	45.9	38
02:15	44.7	38.1
02:30	44.5	37.5
02:45	43	36.7
03:00	41.3	35.5
03:15	42.2	35.9
03:30	44.3	38.2
03:45	42	37.2
04:00	43.9	38.4
04:15	43.5	37.8
04:30	46.2	38.8
04:45	43.6	38.5

05:00	47	41.3
05:15	47.2	42.1
05:30	48	42.6
05:45	48.4	43.3
06:00	50.5	44.9
06:15	50	46
06:30	51.5	46
06:45	50.9	46.4
07:00	50.4	46.9
07:15	49.8	46.3
07:30	49.8	46.9
07:45	49.3	46.5
08:00	51.9	47.7
08:15	53.2	51.7
08:30	53.2	51.7
08:45	52.8	51.3
09:00	54.8	51.7
09:15	54.6	51.7
09:30	53.3	51.4
09:45	52.6	51.1
10:00	52.7	50.9
10:15	54.6	51.2
10:30	53.3	51.2
10:45	54.1	51.7
11:00	54.8	51.5
11:15	52.6	51.4
11:30	52.9	51.5
11:45	56.2	52.1
12:00	54	52
12:15	54	51.6
12:30	53.9	52.1
12:45	53.9	52.3
13:00	55.2	51.8
13:15	53.1	51.6
13:30	53.8	51.5
13:45	53.8	51.3
14:00	57.4	51
14:15	52.5	51.4
14:30	56.5	51.6
14:45	54.3	25.9
15:00	56.3	39.1
15:15	54.6	34.2
15:30	49	33.3
15:45	41.9	34.3
16:00	56.4	35.8
16:15	60.2	39.3

16:30	55.9	34.9
16:45	56	36.6
17:00	44.6	36.7
17:15	57.1	39
17:30	54.5	44.8
17:45	54.1	43.5
18:00	52.9	44.9
18:15	52.3	40.3
18:30	54.3	42.1
18:45	54.8	37.1
19:00	55.3	38.3
19:15	57.4	38.1
19:30	56.4	35
19:45	56.3	47.6
20:00	56.4	45.6
20:15	58.5	48.1
20:30	59	56.3
20:45	58.9	34.9
21:00	60.3	55.3
21:15	60.2	55.2
21:30	65.7	29.7
21:45	54.3	43.3
22:00	51.3	28.6
22:15	49.7	26.8
22:30	45	27.2
22:45	50.5	27
23:00	44	26.5
23:15	53.4	26.6
23:30	44.3	27
23:45	45.1	37.8
00:00	43.1	37.4
00:15	44.9	38.2
00:30	45.6	38.7
00:45	42.5	36.6
01:00	42.6	35.7
01:15	40.5	35
01:30	42.6	34.6
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02:00	43.4	36.8
02:15	43.2	36.2
02:30	41.7	35.4
02:45	40	34.2
03:00	40.9	34.6
03:15	43	36.9
03:30	40.7	35.9
03:45	42.6	37.1

04:00	42.2	36.5
04:15	44.9	37.5
04:30	42.3	37.2
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05:00	45.9	40.8
05:15	46.7	41.3
05:30	47.1	42
05:45	49.2	43.6
06:00	48.7	44.7
06:15	50.2	44.7
06:30	49.6	45.1
06:45	49.1	45.6
07:00	48.5	45
07:15	48.5	45.6
07:30	48	45.2
07:45	50.6	46.4
08:00	51.9	50.4

08:15	51.9	50.4
08:30	51.5	50
08:45	53.5	50.4
09:00	53.3	50.4
09:15	52	50.1
09:30	51.3	49.8
09:45	51.4	49.6
10:00	53.3	49.9
10:15	52	49.9
10:30	52.8	50.4
10:45	53.5	50.2
11:00	51.3	50.1
11:15	51.6	50.2
11:30	54.9	50.8
11:45	52.7	50.7
12:00	52.7	50.3
12:15	52.6	50.8

12:30	52.6	51
12:45	53.9	50.5
13:00	51.8	50.3
13:15	52.5	50.2
13:30	52.5	50
13:45	56.1	49.7
14:00	51.2	50.1
14:15	55.2	50.3
14:30	53	24.6
14:45	55	37.8
15:00	53.3	32.9
15:15	47.7	32
15:30	40.6	33
15:45	52.5	50.2
16:00	52.5	50

3. Site Plan

