

Project: Abbey Corner, 2-4 Kings Road, Reading RG1 3AA
Client: OOK Developments Ltd

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Client:	OOK Developments Ltd			
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Appendix A: Measurement Data

1 Introduction

It is proposed that the existing ground floor level office contained within Abbey Corner, 2-4 Kings Road, Reading RG1 3AA, be converted to form a new residential accommodation.

This impact assessment covers the environmental noise considerations associated with the development in the context of national and local planning policy and guidance. This report should be read in conjunction with any other accompanying documents, plans and technical studies as appropriate.

The assessment contained within this report is based upon the principles and recommendations contained within the following documents:

- National Planning Policy Framework;
- National Policy Statement for England;
- National Planning Practice Guidance, Noise;
- BS8233: 2014: Guidance on sound insulation and noise reduction for buildings;
- World Health Organisation, Guidelines for Community Noise, 1999;
- BS 7445-2:1991, Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use.

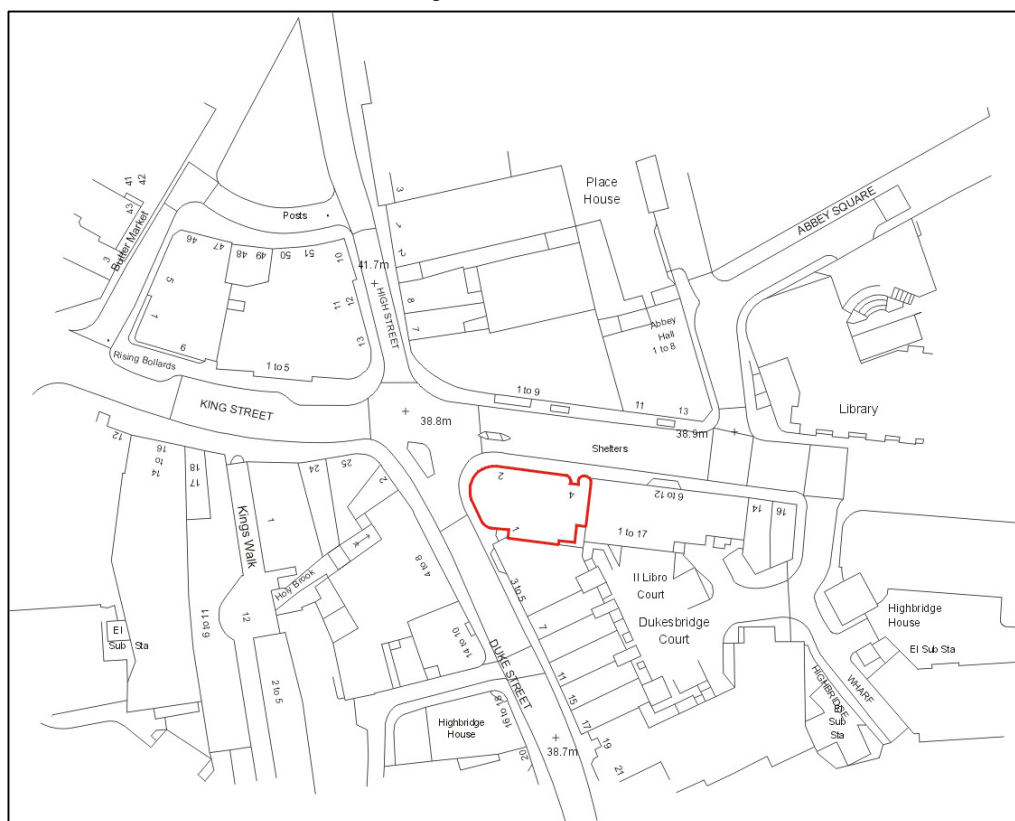
As part of this assessment, the sound insulation requirements of the external fabric of the building will be quantified in the context of policy requirements normally set out by the local planning authority Reading Borough Council (RBC).

2 Site Description

The site is located at Abbey Corner, 2-4 Kings Road, Reading RG1 3AA, lying in an area that contains a mix of residential, commercial and retail premises. The building extends to four storeys in height and is currently given over to commercial usage.

The site location is illustrated by red line in Figure 1 below.

Figure 1: Site location



The site is bounded to the north by Kings Road, a two way road that provides access to the town centre. Immediately to the west of the site is Duke Street, which has a junction with Kings Road and King Street to the north and connects with London Street to the south.

There is mechanical plant at roof level. However the project team has confirmed that it is redundant and does not therefore require consideration as part of this assessment.

3 Planning Policy Context

It is understood that the scheme falls under the provisions of The Town and Country Planning (General Permitted Development) (England) Order 2015 and as such is not subject to a planning application. However, it is nonetheless considered that the guidance given in the National Planning Policy Framework and Noise Policy Statement for England should be fully considered in the interests of securing appropriate levels of amenity for future residential occupiers.

3.1 National Planning Policy Framework 2021

The National Planning Policy Framework 2021 (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.

There are a number of paragraphs in the NPPF that directly mention noise.

Paragraph 174 states that planning policies and decisions should contribute to and enhance the natural and local environment by:

- e) 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 or land instability.

Paragraph 185 states that 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 life¹;
- 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.

3.2 Noise Policy Statement for England 2010

The Noise Policy Statement for England (NPSE) sets out the long term vision of Government noise policy, which is to:

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

This long term vision is supported by the following aims:

“Through the effective management 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;*

¹ See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).

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

When discussing the meaning of "significant adverse" and "adverse", within an Explanatory Note the NPSE states:

"There are two established concepts from toxicology that are currently being applied to noise impacts for example, by the World Health Organisation. They are

NOEL – No Observed Effect Level - This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected."

For the purposes of the NPSE, the Government added the following related concept:

"SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur."

It is also noted that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different sources, for different receptors and at different times.

3.3 National Planning Practice Guidance 2014

The National Planning Practice Guidance (NPPG) was published as an online resource in 2014. It includes guidance on how to recognise when noise could be a concern in planning decisions and includes advice that the planning process should be used to "avoid" significant observed adverse effects occurring, by use of appropriate mitigation such as altering design and layout.

The NPPG also states that the planning process should be used to "*prevent*" unacceptable adverse effects where noise is noticeable and very disruptive leading to extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise leading to psychological stress or physiological effects.

The NPPG provides a summary table setting out the noise exposure hierarchy based on the likely average response, reproduced below.

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
<i>Lowest Observed Adverse Effect Level</i>			
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
<i>Significant Observed Adverse Effect Level</i>			
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	Prevent

4 Guidance on the Assessment of Noise

4.1 BS 8233:2014: Guidance on sound insulation and noise reduction for buildings

This British Standard came into effect on 28 February 2014 and supersedes BS 8233:1999, which is withdrawn.

The standard draws on the results of research and experience to provide information on the design of buildings that have internal acoustic environments appropriate to their functions. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

Indoor ambient noise levels for dwellings are set out at Section 7.7.2, Table 4, reproduced below.

Table 1: Indoor ambient noise levels for dwellings (source: BS 8233:2014, Table 4)

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 $L_{Aeq,8hour}$

A series of notes provide context to the guideline values of Table 4. Note 1 advises that the indoor ambient noise levels are “the sum total of structure-borne and airborne noise sources. Groundborne noise is assessed separately and is not included as part of these targets, as human response to groundborne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.”

Note 3 states “These levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year’s Eve.”

Note 4 deals with individual events and advises that “Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values”.

Note 5 states that if relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation arrangement that does not compromise the façade insulation or the resulting noise level.

Note 7 provides a rider to the guideline values of Table 4, “Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved”.

4.2 World Health Organisation

The recommended indoor ambient noise levels given at Table 4 of BS 8233:2014 do not included a specified value for noise events. Although not explicitly covered in the pre-application advice, it is considered prudent to make an allowance for night noise events as it is often that case this will dictate facade sound insulation requirements for bedrooms.

Guidance on event noise is given in the World Health Organisation (WHO) Guidelines for Community Noise, as below.

The WHO document provided a review of the effects of noise and a description of the principles of health criteria.

Table 1 of the document presents guideline values arranged according to specific environments and critical health effects. Noise indices to be adopted and the accompanying time base to be used for the assessment are also presented.

The guideline values consider all health effects for a specific environment. An adverse health effect refers to any temporary or long-term impairment of physical, psychological or social functioning associated with noise exposure. The specific noise limits were set for each health “using the lowest noise level that produces an adverse health effect”

Table 2: Guideline values for community noise (source: WHO Guidelines for Community Noise Table 1)

Specific environment	Critical health effect(s)	L_{Aeq} [dB]	Time base [hours]	L_{Amax} fast [dB]
Dwelling, indoors	Speech intelligibility & moderate annoyance daytime & evening	35	16	45
	Sleep disturbance, night time	30	8	

For noise events, the guideline value was set at 45 dB L_{Amax} , with research cited in the text advising that this value should not be exceeded by more than 10 to 15 times per night to ensure “good sleep”.

4.3 Reading Borough Council

Based on experience of other comparable local projects, the local planning authority often imposes the following requirements:

“The noise assessment will be assessed against the recommendations for internal noise levels within dwellings and external noise levels within gardens/balconies in accordance with BS 8233:2014 and WHO guidelines for Community Noise. The report should identify any mitigation measures that are necessary to ensure that the recommended standard is met”

And

“Where appropriate, the noise assessment data should also include noise events (L_{Amax}) and the design should aim to prevent noise levels from noise events exceeding 45dB within bedrooms at night. Noise levels above 45dB are linked with sleep disturbance”

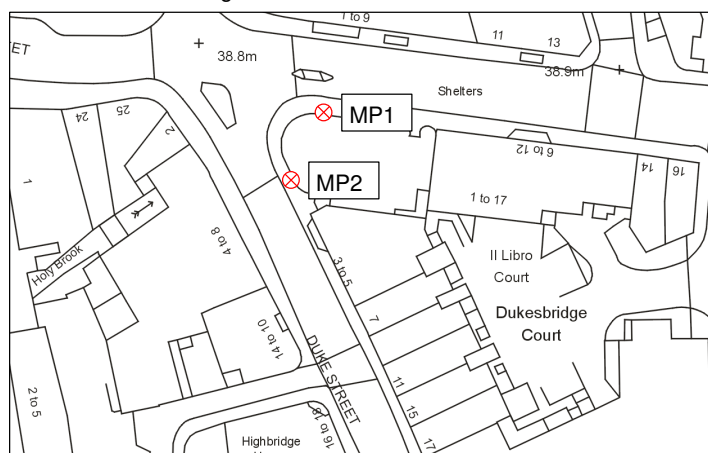
5 Environmental Noise Surveys

5.1 Method

Detailed surveys have been carried out at site to determine the extant noise climate at the site. Measurements were made at the locations described below and illustrated by Figure 3.

- **MP1:** Kings Road elevation, roof level, 1m from façade, subtending an angle of view of 180° to the road;
- **MP2:** Duke Street elevation, roof level, 1m from façade, subtending an angle of view of 180° to the road.

Figure 2: Measurement locations



Surveys were made over the following periods, using continuous, consecutive 15-minute measurement periods:

- **MP1:** 13:59 hours on 10/08/2021 to 11:29 hours on 11/08/2021;
- **MP2:** 11:44 hours on 11/08/2021 to 12:44 hours on 12/08/2021.

Sound pressure level measurements were obtained using the following instrumentation complying with the Type 1 specification of BS EN 60804, BS EN 60651, BS EN 60942, BS EN 61260, and BS EN 61672-1:

The following instrumentation and equipment was used during the survey:

Table 3: Schedule of instrumentation

Type	Serial Number	Calibration Certificate	Calibration Due Date
Norsonic Sound Level Meter Type 118	31990	UCRT21/1344	11 March 2023
Norsonic Preamplifier Type 1206	30642	UCRT21/1344	11 March 2023
Norsonic Microphone Type 1225	62756	UCRT21/1344	11 March 2023
Norsonic Sound Calibrator Type 1251	30867	UCRT21/1336	11 March 2023
Norsonic Outdoor Microphone Protection Kit Type 1212	n/a	n/a	n/a

Field calibration checks were made using a calibrator meeting Class 1 of IEC 60942 at the beginning and end of the measurement session. No significant drift was encountered (0.2 dB), calibration level 114.0 dB $\pm$ 0.2dB @ 1000 Hz $\pm$ 0.2%.

5.2 Results

Noise survey results are summarised in Table 5 and shown as a time series in Figures 3 and 4 below. Broadband results are given over to Appendix A. For brevity, spectral data is available upon request

Figure 3: MP1 Environmental noise time series

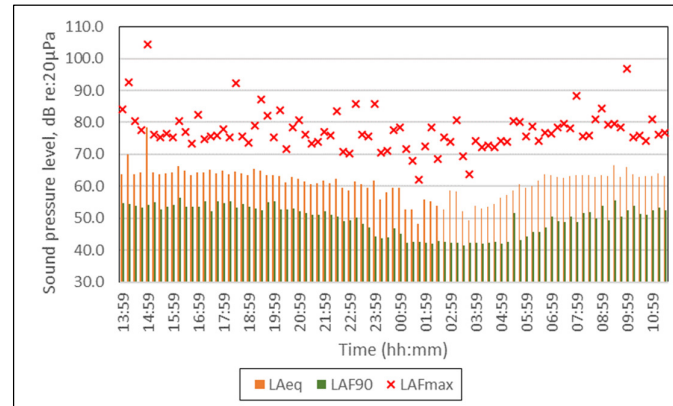


Figure 4: MP2 Environmental noise time series (façade values in dB re: 20µPa)

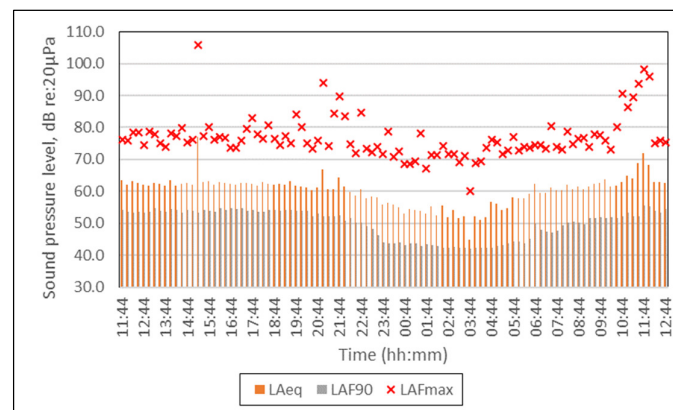


Table 4: Summary of measurement results (façade values in dB re: 20µPa)

Position	Start Date	Sound pressure level, dB re:20µPa		
		$L_{Aeq,16h}$	$L_{Aeq,8h}$	L_{AFmax} (10 th highest)
MP1	10/08/2021	66 dB	58 dB	77 dB
MP2	11/08/2021	64 dB	56 dB	74 dB

6 Building Design

6.1 With-scheme Noise Levels

To determine noise levels across the application site, a detailed three dimensional computer model of the locality has been constructed using CADNA A software, which implements the procedures contained in a number of pertinent documents including Calculation of Road Traffic Noise (CRTN) and ISO 9613-2: Acoustics - Attenuation of sound during propagation outdoors, Part 2: General method of calculation, etc..

The data summarised in the preceding sections has been used as an input to calibrate the model. Predicted noise levels have then been determined at the proposed new dwelling, Figures 5 and 6 illustrate accordingly.

Figure 5: Predicted with-scheme $L_{Aeq,16h}$ noise levels



Figure 6: Predicted with-scheme $L_{Aeq,8h}$ noise levels



6.2 Outline Façade Sound Insulation Specification

To determine the sound insulation requirements of the constituent facade elements detailed calculations to BS EN 12354-3 (or alternatively as per BS 8233:2014) will be need to be undertaken at an appropriate stage of the project.

To demonstrate that external noise ingress may be adequately attenuated, the overall facade sound insulation requirement has been determined using single figure quantities; in this case $R_w + C_{tr}$ as road traffic noise is the dominant source. R_w is the weighted sound reduction index and C and C_{tr} are spectrum adaptation terms 1 and 2 as defined in ISO 717-1.

Figures 7 and 8 show **single figure** day target sound insulation values for living accommodation during the day and night periods respectively. For the purposes of evaluating building façade sound insulation, maximum noise levels at each facade have been derived by pro-rata correction based on the difference between the 10th highest L_{AFmax} and L_{Aeq} values (19 dB), this approach having been adopted in the absence of any guidance in CRTN.

Figure 7: Façade sound insulation targets for internal spaces during the daytime



Figure 8: Façade sound insulation targets for internal spaces during the night



During the daytime, the **most affected** façade has a target value of $R_w + C_{tr}$ 36 dB, which can in principle be attained by the following glazing configuration:

- K/L/D: 10(12)8.8 double glazed unit² - $R_w (C;C_{tr})$ 40 (-1;-4) dB.

At night, the **most affected** façade has a target value of $R_w + C_{tr}$ 37 dB, which can be attained by the following glazing configuration:

- Bedrooms: 10(12)8.8A (Acoustic Laminate) double glazed unit³ - $R_w (C;C_{tr})$ 42 (-1;-5) dB.

Alternatively, the existing glazing may be retained, or retained and enhanced with secondary windows, if it can be demonstrated that the foregoing performance targets would be attained.

6.3 General Guidance

The performance of the system will depend on many factors such as the glazing configuration, size of window panels, quality of framing, quality of sealing, etc. It should be noted that identical sound insulation is obtained irrespective of which way round insulating units are installed. Thus, for example a 6/12/6.4pvb unit gives the same performance as a 6.4pvb/12/6 unit. Over the usual cavity width range of 6 to 20mm for insulating units, there is little variation in acoustic performance although there is a more significant change in thermal insulation. This acoustic performance plateau is due to the relatively strong coupling of the component glasses.

In practice, glazed elements may not need to fully attain these targets as the external elevation will not comprise 100% fenestration area to day spaces and bedrooms.

A detailed specification for façade sound insulation across the whole scheme shall be developed at an appropriate stage of the project by a suitably qualified acoustic consultant, i.e., RIBA works stages 3 and 4. As part of this process, the relevant specialist trade contractor shall provide test data to demonstrate that the required glazing performance values will be achieved. Tests shall be undertaken in a UKAS accredited laboratory (or technically equivalent) in full accordance with BS EN ISO 10140 Parts 1, 2, 4 and 5:2010 (Acoustics - Laboratory measurement of sound insulation of building elements – Part 1: Application rules for specific products. Part 2: Measurement of airborne sound insulation. Part 4: Measurement procedures and requirements. Part 5: Requirements for test facilities and equipment) or an equivalent series of standards.

Single number quantities for sound insulation shall be derived in accordance with BS EN ISO 717-1: 1997 Acoustics – Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation and should include relevant spectrum adaptation terms.

It is emphasised that the guidance configurations described in Section 6.2 are given to demonstrate that proprietary glazing configurations are available that will meet the project design targets. Glazing proposals that simply reflect the guidance constructions indicated in this report will not, in isolation, be sufficient evidence that a window configuration will meet the necessary level of performance.

² Saint-Gobain Glass, Test CSI2006047

³ Saint-Gobain Glass, 626867

7 Ventilation

From experience of other comparable projects, Reading Borough Council Pre-application advice advises the following:

“Ventilation measures should be selected which do not allow unacceptable noise ingress and should provide sufficient ventilation to avoid the need to open windows in hot weather, however non-openable windows are not considered an acceptable solution due to the impact on living standards”

The selection of ventilation measures should be carried out by a suitably qualified practitioner; however, general acoustic principles are discussed below.

It is suggested that continuous mechanical supply and extract with heat recovery (System 4 - MVHR) and cooling (if necessary) be used. Background ventilators are not required with system 4. System 4 - MVHR provides background ventilation. At the appropriate stage of the project others are to assess whether ventilation/cooling is required for an ‘overheating condition’ influenced by the location, orientation, type and design of the building and may be required for sustained periods of time, or not at all, depending on the overheating risk.

It is noted that Approved document F advises that adequate purge ventilation may be achieved by the use of openable windows and /or doors. The Association of Noise Consultants document Acoustics Ventilation and Overheating Residential Design Guide advises that for Purge Ventilation no desirable noise levels are currently proposed based on the lack of evidence of acceptable noise levels when providing purge ventilation for the purpose of rapidly diluting indoor pollutants. As such, and on the basis of the noise levels reported herein, openable windows could be used for purge ventilation.

Any such system shall be designed by others such that the systems do not undermine the building envelope acoustic properties discussed herein, and any external equipment used shall be suitably attenuated in order to give a low adverse impact to the occupiers of all properties.

The ventilation shall be by means of a continuous mechanical supply and extract with heat recovery (MVHR) and cooling (where deemed necessary). The specialist contractor shall ensure that self-generated noise from the mechanical ventilation system meets the guidance given at paragraph 4.3.6 of Approved Document F 2010 and that attenuators are incorporated to reduce external noise sources to appropriate internal levels. The ventilation system shall be designed such that its overall noise level contribution in any living room is no more than 25 dB(A), and in any bedroom no more than 20 dB(A). This includes the combined, total noise levels due to self-generated noise from powered elements, aerodynamic noise, external noise ingress via the system itself and break-out noise levels.

8 Conclusions

Detailed environmental noise surveys have been carried in respect of the proposed ground floor level conversion of Abbey Corner, 2-4 Kings Road, Reading RG1 3AA.

The assessment considers the potential impacts and effects of transportation sources upon the proposed development and, where necessary, its mitigation, in order to demonstrate the suitability of the site development in the context of National and Local Planning Policy and Guidance.

Where there is potential for adverse effects of noise, appropriate outline mitigation measures have been identified in the form of building envelope sound insulation performance, including guidance on ventilation requirements. The adoption of such principles is considered to conform to the requirements of National Planning Policy in avoiding or reducing to a minimum, any adverse effects on any sensitive internal or external spaces, within the context of sustainable development and accords with the principles of good design.

It is considered that sufficient information has been presented to address any acoustic queries that the Local Planning Authority may have.

Appendix A: Measurement Data

MP1

No.	Date & time	LAFmax	LAeq	LAF90
1	10/08/2021 13:59:10	84.1	63.7	54.8
2	10/08/2021 14:14:10	92.6	70.1	54.4
3	10/08/2021 14:29:10	80.5	63.7	54.0
4	10/08/2021 14:44:10	77.5	64.5	53.4
5	10/08/2021 14:59:10	104.4	78.3	54.2
6	10/08/2021 15:14:10	76.3	64.4	55.1
7	10/08/2021 15:29:10	75.2	63.9	52.9
8	10/08/2021 15:44:10	76.4	64.0	53.5
9	10/08/2021 15:59:10	75.4	64.3	54.3
10	10/08/2021 16:14:10	80.5	66.2	56.3
11	10/08/2021 16:29:10	77.0	64.9	53.6
12	10/08/2021 16:44:10	73.5	63.4	53.6
13	10/08/2021 16:59:10	82.4	64.3	53.6
14	10/08/2021 17:14:10	74.7	64.4	55.2
15	10/08/2021 17:29:10	75.6	65.1	52.2
16	10/08/2021 17:44:10	76.0	64.0	55.2
17	10/08/2021 17:59:10	77.9	64.8	54.8
18	10/08/2021 18:14:10	75.3	63.9	55.2
19	10/08/2021 18:29:10	92.3	64.6	53.2
20	10/08/2021 18:44:10	75.5	64.0	54.4
21	10/08/2021 18:59:10	73.7	63.4	53.6
22	10/08/2021 19:14:10	79.1	65.6	53.1
23	10/08/2021 19:29:10	87.3	65.0	52.5
24	10/08/2021 19:44:10	82.1	63.4	55.0
25	10/08/2021 19:59:10	75.4	63.4	55.3
26	10/08/2021 20:14:10	83.9	63.2	52.8
27	10/08/2021 20:29:10	71.7	61.4	52.9
28	10/08/2021 20:44:10	78.6	62.8	53.1
29	10/08/2021 20:59:10	80.7	62.4	52.2
30	10/08/2021 21:14:10	76.2	61.4	51.5
31	10/08/2021 21:29:10	73.4	60.7	51.1
32	10/08/2021 21:44:10	74.1	60.8	51.1
33	10/08/2021 21:59:10	77.1	61.9	52.3
34	10/08/2021 22:14:10	75.9	60.9	51.0
35	10/08/2021 22:29:10	83.5	62.3	50.5
36	10/08/2021 22:44:10	70.7	59.7	49.2
37	10/08/2021 22:59:10	70.3	58.8	49.3

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38	10/08/2021 23:14:10	85.7	61.5	50.3
39	10/08/2021 23:29:10	76.2	60.7	48.2
40	10/08/2021 23:44:10	75.6	59.5	47.0
41	10/08/2021 23:59:10	85.7	61.8	44.4
42	11/08/2021 00:14:10	70.4	55.9	43.7
43	11/08/2021 00:29:10	71.2	58.0	43.9
44	11/08/2021 00:44:10	77.7	59.5	46.8
45	11/08/2021 00:59:10	78.4	59.6	45.2
46	11/08/2021 01:14:10	71.6	52.9	42.3
47	11/08/2021 01:29:10	68.0	52.7	42.6
48	11/08/2021 01:44:10	62.0	48.3	42.5
49	11/08/2021 01:59:10	72.6	55.8	42.3
50	11/08/2021 02:14:10	78.3	55.3	42.0
51	11/08/2021 02:29:10	68.5	54.0	42.8
52	11/08/2021 02:44:10	75.3	52.8	42.6
53	11/08/2021 02:59:10	74.0	58.7	42.4
54	11/08/2021 03:14:10	80.7	58.5	42.2
55	11/08/2021 03:29:10	69.3	52.2	41.5
56	11/08/2021 03:44:10	63.7	49.3	42.3
57	11/08/2021 03:59:10	74.3	53.9	42.3
58	11/08/2021 04:14:10	72.1	53.0	41.9
59	11/08/2021 04:29:10	72.9	53.6	42.2
60	11/08/2021 04:44:10	72.1	54.4	42.5
61	11/08/2021 04:59:10	74.1	56.5	42.1
62	11/08/2021 05:14:10	74.0	57.3	42.6
63	11/08/2021 05:29:10	80.6	58.8	51.6
64	11/08/2021 05:44:10	80.3	60.7	43.2
65	11/08/2021 05:59:10	75.8	59.5	44.3
66	11/08/2021 06:14:10	78.6	60.2	45.8
67	11/08/2021 06:29:10	74.1	61.8	45.7
68	11/08/2021 06:44:10	76.8	63.7	47.1
69	11/08/2021 06:59:10	76.4	63.6	50.6
70	11/08/2021 07:14:10	78.5	62.8	49.0
71	11/08/2021 07:29:10	79.7	62.7	48.8
72	11/08/2021 07:44:10	78.3	63.2	50.6
73	11/08/2021 07:59:10	88.2	63.5	48.9
74	11/08/2021 08:14:10	75.6	63.5	51.7
75	11/08/2021 08:29:10	75.9	63.6	52.0
76	11/08/2021 08:44:10	81.0	62.8	49.9
77	11/08/2021 08:59:10	84.4	63.6	54.0
78	11/08/2021 09:14:10	79.4	63.3	49.5
79	11/08/2021 09:29:10	79.5	66.5	55.6
80	11/08/2021 09:44:10	78.4	63.0	50.6

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81	11/08/2021 09:59:10	96.8	66.1	52.6
82	11/08/2021 10:14:10	75.4	63.8	53.8
83	11/08/2021 10:29:10	75.8	62.9	51.3
84	11/08/2021 10:44:10	74.3	63.1	51.1
85	11/08/2021 10:59:10	81.0	63.2	52.6
86	11/08/2021 11:14:10	76.2	63.9	53.2
87	11/08/2021 11:29:10	76.7	63.1	52.6

MP2

No.	Date & time	LAFmax	LAeq	LAF90
88	11/08/2021 11:44:10	76.2	63.4	54.3
89	11/08/2021 11:59:10	75.9	61.9	53.7
90	11/08/2021 12:14:10	78.3	63.1	53.4
91	11/08/2021 12:29:10	78.4	62.6	53.6
92	11/08/2021 12:44:10	74.5	62.1	53.4
93	11/08/2021 12:59:10	78.7	61.8	53.6
94	11/08/2021 13:14:10	77.9	62.8	54.6
95	11/08/2021 13:29:10	75.1	62.2	53.9
96	11/08/2021 13:44:10	73.9	61.7	53.6
97	11/08/2021 13:59:10	78.2	63.5	54.4
98	11/08/2021 14:14:10	77.4	61.7	54.3
99	11/08/2021 14:29:10	79.9	62.2	53.3
100	11/08/2021 14:44:10	75.4	62.6	54.1
101	11/08/2021 14:59:10	76.2	62.1	53.9
102	11/08/2021 15:14:10	105.9	77.1	53.4
103	11/08/2021 15:29:10	77.4	62.9	54.3
104	11/08/2021 15:44:10	80.1	63.3	53.9
105	11/08/2021 15:59:10	76.2	62.2	53.5
106	11/08/2021 16:14:10	76.9	62.9	54.6
107	11/08/2021 16:29:10	76.7	62.6	54.2
108	11/08/2021 16:44:10	73.5	62.3	54.8
109	11/08/2021 16:59:10	73.5	62.2	54.5
110	11/08/2021 17:14:10	75.9	62.6	54.7
111	11/08/2021 17:29:10	79.5	62.7	54.0
112	11/08/2021 17:44:10	83.0	62.3	54.1
113	11/08/2021 17:59:10	77.9	61.8	53.7
114	11/08/2021 18:14:10	76.4	62.8	53.7
115	11/08/2021 18:29:10	80.6	62.4	54.1
116	11/08/2021 18:44:10	76.3	62.0	54.2
117	11/08/2021 18:59:10	74.6	62.5	53.8
118	11/08/2021 19:14:10	77.4	62.0	54.1
119	11/08/2021 19:29:10	75.2	63.3	54.1

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120	11/08/2021 19:44:10	84.2	61.8	54.0
121	11/08/2021 19:59:10	80.0	61.6	54.0
122	11/08/2021 20:14:10	74.9	61.3	53.9
123	11/08/2021 20:29:10	73.3	60.4	52.3
124	11/08/2021 20:44:10	76.0	61.3	52.9
125	11/08/2021 20:59:10	94.0	67.0	52.1
126	11/08/2021 21:14:10	74.3	60.8	52.1
127	11/08/2021 21:29:10	84.5	60.7	52.3
128	11/08/2021 21:44:10	89.9	64.4	52.4
129	11/08/2021 21:59:10	83.5	61.4	50.7
130	11/08/2021 22:14:10	74.8	59.9	51.7
131	11/08/2021 22:29:10	72.0	58.5	50.2
132	11/08/2021 22:44:10	84.5	60.7	50.3
133	11/08/2021 22:59:10	73.3	58.0	49.1
134	11/08/2021 23:14:10	72.3	58.4	48.1
135	11/08/2021 23:29:10	73.8	58.0	46.3
136	11/08/2021 23:44:10	71.7	55.8	44.1
137	11/08/2021 23:59:10	78.7	56.5	43.7
138	12/08/2021 00:14:10	70.9	56.0	43.6
139	12/08/2021 00:29:10	72.4	55.0	44.1
140	12/08/2021 00:44:10	68.6	53.0	43.2
141	12/08/2021 00:59:10	68.7	54.3	43.6
142	12/08/2021 01:14:10	69.3	54.1	43.6
143	12/08/2021 01:29:10	78.1	53.9	42.8
144	12/08/2021 01:44:10	67.1	53.1	43.3
145	12/08/2021 01:59:10	71.3	55.2	43.2
146	12/08/2021 02:14:10	71.4	52.5	42.8
147	12/08/2021 02:29:10	74.3	55.4	42.4
148	12/08/2021 02:44:10	71.8	51.8	42.3
149	12/08/2021 02:59:10	71.7	54.2	42.7
150	12/08/2021 03:14:10	69.0	51.6	42.4
151	12/08/2021 03:29:10	71.1	52.2	42.4
152	12/08/2021 03:44:10	60.0	45.0	42.0
153	12/08/2021 03:59:10	68.9	52.1	42.2
154	12/08/2021 04:14:10	69.4	51.0	42.3
155	12/08/2021 04:29:10	73.5	52.0	42.2
156	12/08/2021 04:44:10	76.1	56.7	42.2
157	12/08/2021 04:59:10	75.3	56.0	43.0
158	12/08/2021 05:14:10	71.8	54.2	43.1
159	12/08/2021 05:29:10	72.8	54.6	43.6
160	12/08/2021 05:44:10	77.0	58.2	44.3
161	12/08/2021 05:59:10	72.9	57.7	44.3
162	12/08/2021 06:14:10	73.8	57.7	43.8

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163	12/08/2021 06:29:10	73.8	59.4	45.1
164	12/08/2021 06:44:10	74.5	62.2	49.9
165	12/08/2021 06:59:10	74.4	59.5	48.0
166	12/08/2021 07:14:10	73.4	59.5	47.3
167	12/08/2021 07:29:10	80.3	61.1	47.0
168	12/08/2021 07:44:10	74.0	60.5	47.7
169	12/08/2021 07:59:10	73.2	60.4	49.3
170	12/08/2021 08:14:10	78.7	62.0	50.3
171	12/08/2021 08:29:10	74.8	60.5	50.4
172	12/08/2021 08:44:10	76.4	61.6	50.3
173	12/08/2021 08:59:10	76.6	60.8	49.7
174	12/08/2021 09:14:10	73.8	61.5	51.6
175	12/08/2021 09:29:10	77.9	62.4	51.6
176	12/08/2021 09:44:10	77.6	62.8	51.8
177	12/08/2021 09:59:10	75.9	63.7	51.5
178	12/08/2021 10:14:10	73.2	61.6	51.8
179	12/08/2021 10:29:10	80.2	61.8	51.7
180	12/08/2021 10:44:10	90.6	62.9	52.2
181	12/08/2021 10:59:10	86.4	64.9	53.2
182	12/08/2021 11:14:10	89.5	64.1	52.1
183	12/08/2021 11:29:10	93.7	68.7	52.2
184	12/08/2021 11:44:10	98.3	72.0	55.5
185	12/08/2021 11:59:10	96.0	68.4	55.3
186	12/08/2021 12:14:10	74.9	62.8	53.9
187	12/08/2021 12:29:10	76.0	62.8	53.2
188	12/08/2021 12:44:10	75.5	62.7	54.5