



Project:	76 Christchurch Road, Reading		
Client:	RYTDAL LTD		
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Opinions included herein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations, Paragon Acoustic Consultants Ltd reserves the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

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1 Introduction

The existing building occupying 76 Christchurch Road, Reading is undergoing redevelopment to provide a new A5 use at ground floor level. Paragon Acoustic Consultants Ltd has been commissioned by RYTDAK LTD to conduct a noise impact assessment in response to a request by the Local Planning Authority, i.e.:

Item 15 – Noise and vibration impact assessment

As the proposed development includes an A5 (takeaway) and a residential use above, it is required that a noise and vibration impact assessment be prepared in support of the proposed development in accordance with the LPA validation requirements.

2 Site Description

The site under consideration is situated at 76 Christchurch Road, Reading, and is to comprise conversion of a former bank to provide a new A5 use at ground floor level with residential accommodation above.

The site lies in area that contains a mix of residential dwellings, commercial premises and retail outlets.

The site is bounded to the north by Christchurch Road a moderately trafficked two-way road that has a junction with the B3031 approximately 600m to the west.

The area immediately to the south of the site is largely given over to car parking associated with the commercial premises having their frontages on Christchurch Road. A number of items of third party mechanical plant were observed in this aspect.

The site location and internal layout of the proposed scheme is illustrated in Figures 1 and 2 below.

Figure 1: Site Location

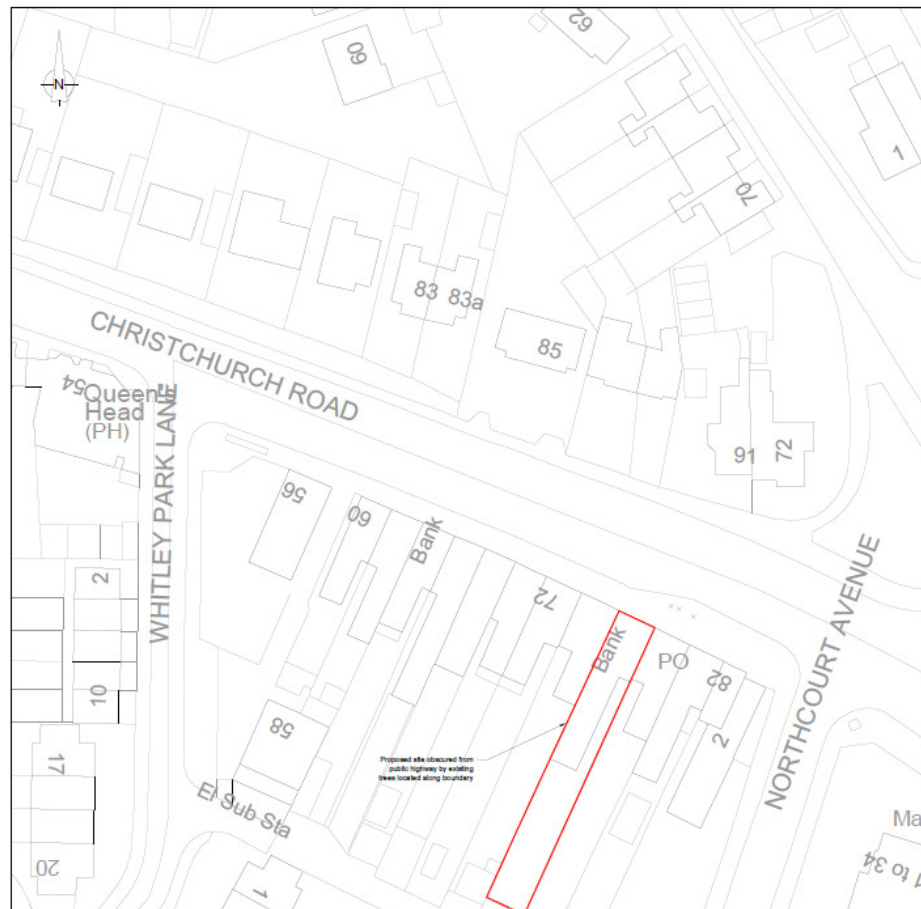
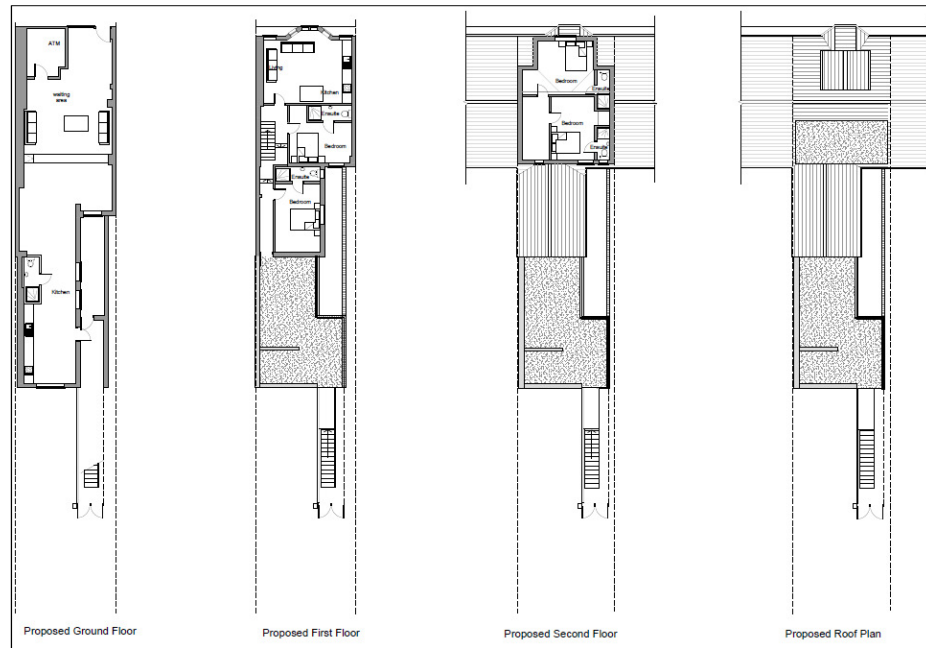


Figure 2: Internal layout of scheme



3 Environmental Noise Surveys

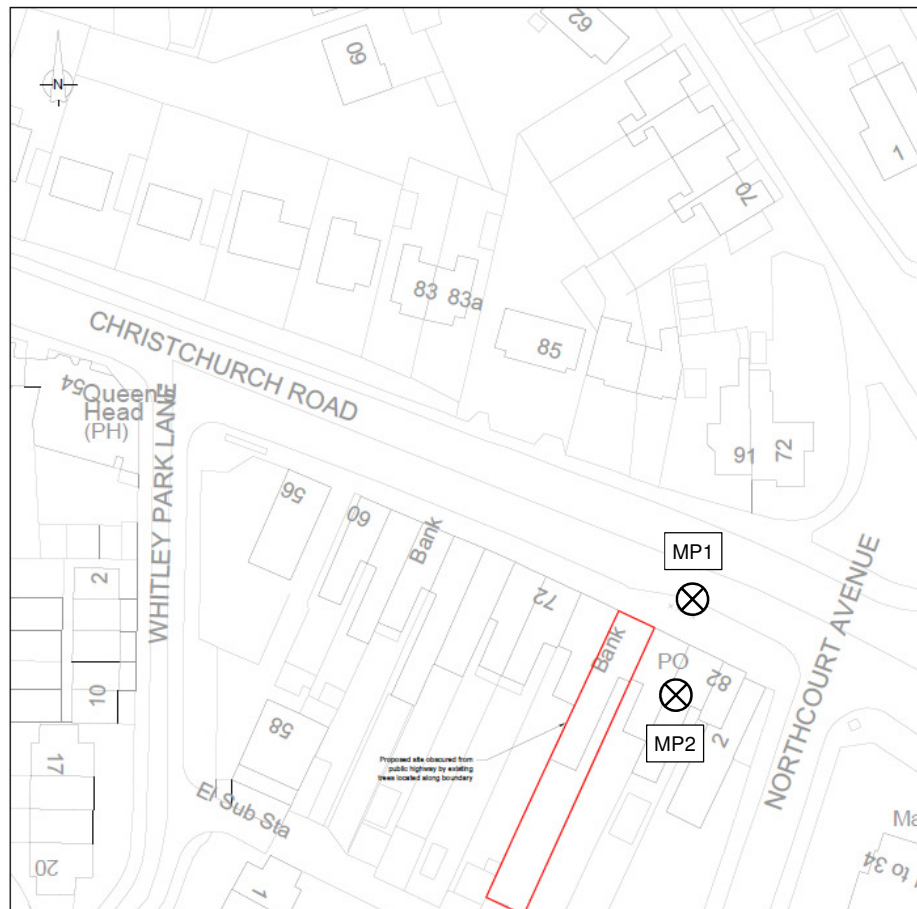
3.1 Method

Noise monitoring was undertaken on 17 and 18 June 2019 at the location described below and illustrated by Figure 3.

MP1: Front elevation, second floor level, of the existing 76 Christchurch Road building;

MP2: Rear elevation, second floor level, of the existing 76 Christchurch Road building;

Figure 3: Noise monitoring positions



At each measurement position, the microphone was mounted on an extension such that the diaphragm was of the order 1m from facade.

The measurements were obtained using the instrumentation scheduled below, which complies with the Type 1 specification of IEC 60651 and IEC 60804, Class 1 specification of IEC 61260 and IEC 61672 and Class 1 of IEC 60942 as applicable.

Field calibration checks were made at the beginning and end of each measurement session. No significant drift was encountered, calibration level with matched calibrator 113.8 dB(A) ($\pm 0.2\text{dB}$ @ 1000 Hz $\pm 0.2\%$), observed drift 0.1 dB.

Table 1: Equipment Details

Equipment Description and Serial Number	Manufacturer	Model Number	Calibration certificate number	Calibration expiry date
Sound level analyser, s/n 31663	Norsonic	NOR 118	U28129	16/03/2020
Microphone, s/n 65276	Norsonic	NOR 1225	U28129	16/03/2020
Acoustic Calibrator, s/n 31313	Norsonic	NOR 1251	U28128	16/03/2020
Preamplifier, s/n 30342	Norsonic	NOR 1206	U28128	16/03/2020
Sound level analyser, s/n 31990	Norsonic	NOR 118	U29388	24/08/2020
Microphone, s/n 29831	Norsonic	NOR 1225	U29387	24/08/2020
Acoustic Calibrator, s/n 30867	Norsonic	NOR 1251	U29386	24/08/2020
Preamplifier, s/n 26695	Norsonic	NOR 1201	U29388	24/08/2020

Various statistical broad-band and spectral sound pressure level measurements were obtained during the survey. A measurement time interval $T_m = 5$ minutes was used for sampling.

The quantities recorded included:

$L_{Aeq,T}$: the equivalent continuous A-weighted sound pressure level over the measurement period, T;

L_{AFmax} : the maximum A-weighted sound pressure level for the measurement period;

$L_{AF90\%,T}$: the A-weighted sound pressure level exceeded for 90% of the measurement period, T.

Weather conditions¹ during the survey were typically as per Table 2 below.

Table 2: Typical weather data during survey period

Day and Date	Temperature		Average Humidity	Average Pressure	Average wind speed	Precip.
	Min	Max				
17 June 2019	12°C	22°C	67%	102 kPa	1.8 ms ⁻¹	0.0 mm
18 June 2019	11°C	19°C	81%	102 kPa	0.3 ms ⁻¹	1.4 mm

¹ Weather station Redaing114

3.2 Results

The measured survey data is reproduced in Appendix A and summarised below.

Figure 4: Measurement results at MP1

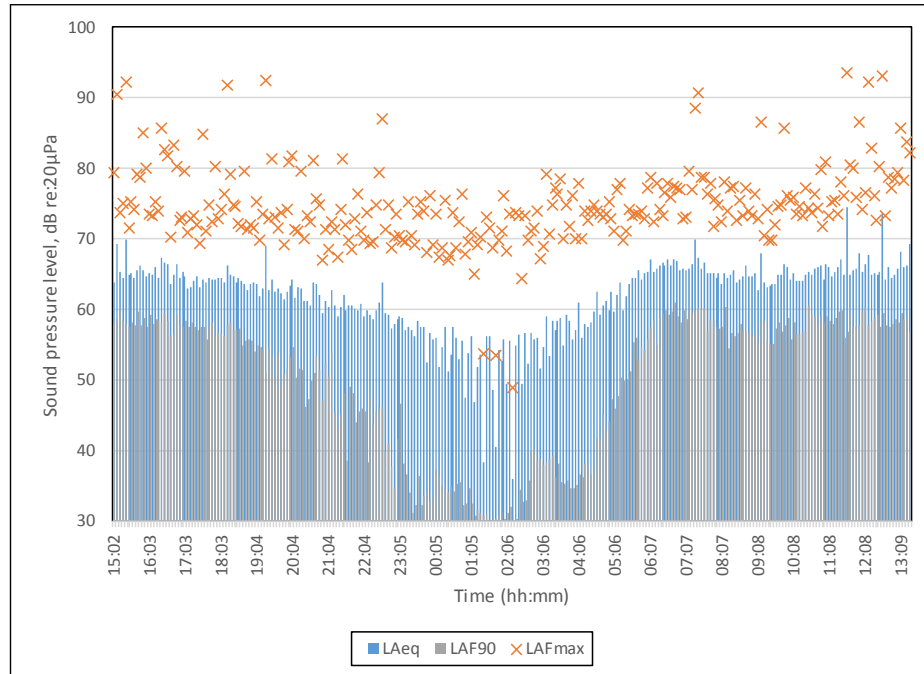
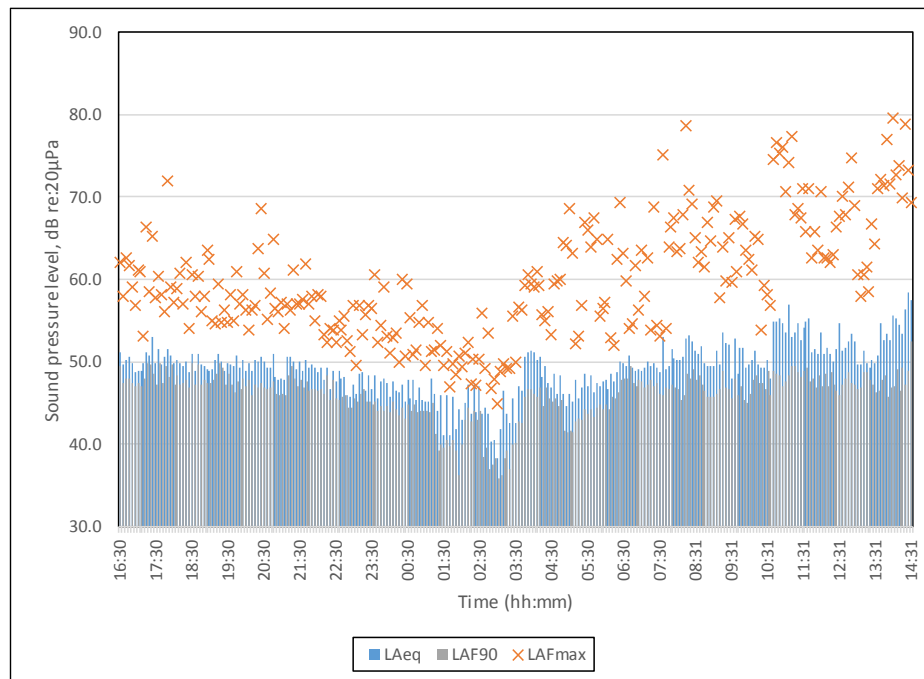


Figure 5: Measurement results at MP2



From Figures 4 and 5, the following values result:

Table 3

Measurement Position	Facade	Period	Façade sound pressure level dB re: 20µPa	
			$L_{Aeq,T}$	L_{AFmax} [1]
MP1	Front (northeast)	Day 07:00-23:00	65	n/a
		Night 23:00-07:00	61	76
MP2	Rear (southwest)	Day 07:00-23:00	51	n/a
		Night 23:00-07:00	47	61
Notes				
[1] 15 th highest value				

4 Planning Policy and Guidance on the Assessment of Noise

4.1 National Planning Policy Framework 2019

The [NPPF](#)² 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 170 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 180 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 life³;
- 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.

4.2 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;*
- *mitigate and minimise adverse impacts on health and quality; and*

²

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779764/NPPF_Feb_2019_web.pdf

³ See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).

- *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.

4.3 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

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

This British Standard came into effect on 28 February 2014 and superseded BS 8233:1999, which was 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 4: Indoor ambient noise levels for dwellings (from 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”*.

4.5 WHO Guidelines for Community Noise

This document provides a review of the effects of noise and a description of the principles of the WHO health criteria and guidelines for Community Noise.

The effects of noise in dwellings are identified as sleep disturbance, annoyance and speech interference. For bedrooms, the critical effect is sleep disturbance. The indoor guideline value for continuous noise in bedrooms is 30 dB L_{Aeq} .

For noise events, the guideline value has been set at 45 dB L_{Amax} , and it is further advised that this value should not be exceeded by more than 10-15 times per night to ensure "good sleep".

To enable casual conversation indoors during the daytime, the sound level of the interfering noise should not exceed 35 dB L_{Aeq} .

Table 1 of the document summarises the guideline values for community noise in specific environments and includes the noise indices to be adopted. Significantly, the corresponding time base to be used for the assessment is also included. The relevant extracts of the WHO's Table 1 are reproduced thus:

Table 5: Guideline values for community noise in specific environments
(source: WHO "Guidelines for Community Noise")

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	

5 Assessment of External Noise Ingress to Proposed Dwellings

Facade sound insulation calculations have been undertaken in accordance with Annex G of BS 8233:2014, with illustrative example calculation sheets given in Appendix A.

$$L_{eq,2} = L_{eq,ff} + 10 \lg \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \lg \left(\frac{S}{A} \right) + 3$$

$L_{eq,ff}$ is the equivalent continuous sound pressure level outside the room element under consideration. It is the free-field sound level, measured or calculated, at the intended position of the element under consideration;

A_0 is a reference absorption area of 10m² and is independent of frequency;

S_f is the total facade area of the room in question in square metres (m²);

S_{wi} is the area in square metres (m²) of the windows of the room;

S_{ew} is the area in square metres (m²) of the external wall of the room;

S_{rr} is the area in square metres (m²) of the ceiling of the room;

S is the total area of elements through which sound enters the room in square metres (m²), i.e. $S_f + S_{rr}$;

$D_{n,e}$ is the insulation of the ventilator measured according to BS EN 20140-10;

R_{wi} is the sound reduction index of the window;

R_{ew} is the sound reduction index of the external wall;

R_{rr} is the sound reduction index of the roof;

A is the equivalent absorption area of the receiving room.

The standard notes that estimated levels may differ from measured values and advises that the expected precision of the calculation is ± 2 dB L_{Aeq} .

5.1 Room Surface Finishes

It has been assumed that living rooms and bedrooms will be fitted out with carpet coverings and other soft furnishings. Reverberation times of circa 0.5 seconds and 0.4 seconds have been taken respectively.

5.2 Masonry External Wall

External walls are retained and are understood to comprise solid brickwork of thickness 9" (circa 225mm) with a rendered finish. The sound insulation performance of the external wall has been determined using Insul v8.0.12, as per Table 6:

Table 6: Predicted External Wall Performance

Element	Sound Reduction Index (R) dB at 1/1 Octave Band Centre Frequency (Hz)							ISO 717-1 single number quantity $R_w (C; C_{tr})$ dB
	63	125	250	500	1k0	2k0	4k0	
225mm thick rendered solid brickwork	41	39	44	52	59	63	68	55 (-1;-5)

5.3 Glazing Performance Requirements

The glazing sound insulation performance requirements are set out in Table 7 below, together with guidance glazing selections for illustrative purposes.

Table 7: Glazing Sound Insulation Requirements and Guidance Configuration

Facade	Space	Sound Reduction Index (R) dB at 1/1 Octave Band Centre Frequency (Hz)							ISO 717-1 Single Figure Ratings dB			Guidance Glazing Configuration
		63	125	250	500	1k0	2k0	4k	R_w	C	C_{tr}	
Front	K/L/D	15	21	20	27	38	41	37	30	-1	-4	4(20)4 double glazed unit
	Bed	15	21	20	27	38	41	37	30	-1	-4	4(20)4 double glazed unit
Rear	Bed	14	19	20	26	30	34	23	29	-1	-3	Any glazed configuration

As the target indoor ambient noise levels are expressed as broadband single figure dB(A) values, other frequency specific performance levels for glazed elements may ultimately prove acoustically acceptable.

5.4 Ventilation

Ventilation to apartments may comprise either System 3 or System 4 of Approved Document F:2010, generally as below.

5.4.1 System 3

System 3 ventilation comprises continuous mechanical extract ventilation (MEV). In summary, the approved document advises that:

- background ventilators of minimum equivalent area 2500mm² should be fitted in each room, except wet rooms, from which air is extracted, and:
 - They should be located to avoid draughts, e.g., typically 1.7m above floor level;
 - Fans and background ventilators fitted in the same room should be a minimum of 0.5m apart
 - Background ventilators may be either manually adjusted or automatically controlled;
- As an alternative, where the air permeability is leakier than ($>$) 5m³/(h.m²) at 50 Pa, background ventilators are not necessary.

In the event that background ventilators need to be installed, the following performance requirements would need to be attained:

Table 8: Background ventilator performance requirements

Facade	Element normalized level difference Index ($D_{n,e}$) dB at 1/1 Octave Band Centre Frequency (Hz)							ISO 717-1 Single Figure Ratings dB		
	63	125	250	500	1k0	2k0	4k	$D_{n,e,w}$	C	C_{tr}
Front	34	34	39	38	38	44	40	41	-1	-2

Table 8 assumes 1 number ventilator per room of minimum equivalent area 2500mm². Should a greater number of background ventilators per room be required, then the ventilator performance values given in Table 8 shall be enhanced according to $\Delta D_{n,e} = 10 \lg (n_2/1)$, where $\Delta D_{n,e}$ is the improvement in the ventilator element normalised level difference and n_2 is the total number of ventilators per room.

5.4.2 System 4

System 4 ventilation comprises a whole house arrangement such continuous mechanical supply and extract with heat recovery (MVHR). In summary, the approved document advises that:

- Extract should be from each wet room. Air should normally be supplied to each habitable room
- Mechanical extract terminals and fans should be installed as high as is practical, and preferably less than 400mm below the ceiling.
- Mechanical supply terminals should be located and directed to avoid draughts.
- Background ventilators are not required for System 4.

6 Conclusions

A detailed environmental noise survey has been undertaken to determine the underlying ambient and background noise climate.

Appropriate external noise criteria have been identified on the basis of relevant industry standards and references and the sound insulation performance of the external building fabric has been identified accordingly.

Appendix A: Calculation Results

Outdoor To Indoor Sound Transmission Calculation (v8.0.12)

According to EN12354/3

Title :76 Christchurch Road

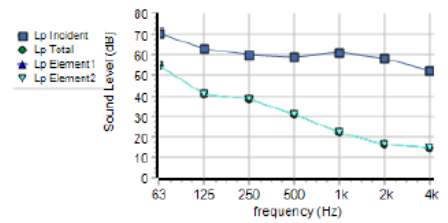
Comments :

Front Elev K/L/D

Date: 25 Jun 19

Initials:patrick

File Name: 20190625_4471_KLD Leq.inz



Octave Band Centre Frequency (Hz)								Overall dBA
Source	63	125	250	500	1k	2k	4k	
Incident sound level (freefield)	71	63	60	59	61	59	53	65
Path								
Element 1 ,225mm Brick STL	-41	-39	-44	-52	-59	-63	-68	-48
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [6.7 m²]	8	8	8	8	8	8	8	
Element sound level contribution	-40	-38	-43	-51	-58	-62	-67	
Element 2 ,Glazing 4 (20) 4 STL	-15	-21	-20	-27	-38	-41	-37	35
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [4.6 m²]	7	7	7	7	7	7	7	
Element sound level contribution	55	41	39	31	22	16	14	
Receiver								
Room volume (-10Log V) [38 m³]	-16	-16	-16	-16	-16	-16	-16	35
Reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10Log T)	-3	-3	-3	-3	-3	-3	-3	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	55	41	39	31	22	16	14	

Outdoor To Indoor Sound Transmission Calculation (v8.0.12)

According to EN12354/3

Title :76 Christchurch Road

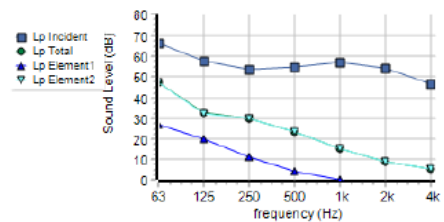
Comments :

Front Elev Bed Leq

Date: 26 Jun 19

Initials:patrick

File Name: 20190626_4471_FE Bed Leq.inz



Octave Band Centre Frequency (Hz)								Overall dBA
Source	63	125	250	500	1k	2k	4k	
Incident sound level (freefield)	66	58	54	55	57	54	47	61
Path								
Element 1 ,225mm Brick STL	-41	-39	-44	-52	-59	-63	-68	9
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [5.6 m²]	7	7	7	7	7	7	7	
Element sound level contribution	27	20	11	4	-0.2	-7.5	-20	
Element 2 ,Glazing 4 (20) 4 STL	-15	-21	-20	-27	-38	-41	-37	26
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [1.5 m²]	2	2	2	2	2	2	2	
Element sound level contribution	47	32	30	23	15	8.8	5.2	
Receiver								
Room volume (-10Log V) [20 m³]	-13	-13	-13	-13	-13	-13	-13	26
Reverberation time (s)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
RT (+10Log T)	-4	-4	-4	-4	-4	-4	-4	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	47	33	30	23	15	8.9	5.2	

Outdoor To Indoor Sound Transmission Calculation (v8.0.12)

According to EN12354/3

Title :76 Christchurch Road

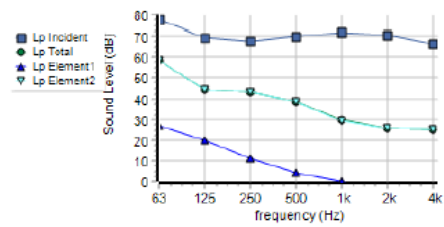
Comments :

Front Elev Bed Lmax

Date: 26 Jun 19

Initials:patricks

File Name: 20190626_4471_FE Bed Lmax.inz



Octave Band Centre Frequency (Hz)								Overall dBA
Source	63	125	250	500	1k	2k	4k	
Incident sound level (freefield)	78	70	68	70	72	71	66	76
Path								
Element 1 ,225mm Brick STL	-41	-39	-44	-52	-59	-63	-68	9
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [5.6 m²]	7	7	7	7	7	7	7	
Element sound level contribution	27	20	11	4	-0.2	-7.5	-20	
Element 2 ,Glazing 4 (20) 4 STL	-15	-21	-20	-27	-38	-41	-37	40
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [1.5 m²]	2	2	2	2	2	2	2	
Element sound level contribution	58	44	43	39	29	25	25	
Receiver								
Room volume (-10Log V) [20 m³]	-13	-13	-13	-13	-13	-13	-13	40
Reverberation time (s)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
RT (+10Log T)	-4	-4	-4	-4	-4	-4	-4	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	58	45	43	39	30	26	25	

Outdoor To Indoor Sound Transmission Calculation (v8.0.12)

According to EN12354/3

Title :76 Christchurch Road

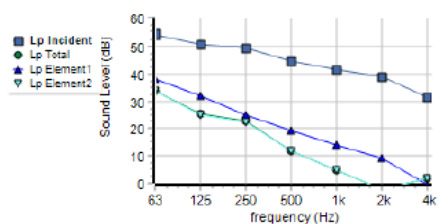
Comments :

Rear Elev Bed Leq

Date: 26 Jun 19

Initials:patrick

File Name: 20190626_4471_RE Bed Leq.inz



Octave Band Centre Frequency (Hz)								Overall dBA
Source	63	125	250	500	1k	2k	4k	
Incident sound level (freefield)	54	51	49	45	42	39	32	47
Path								
Element 1 ,225mm Brick STL	-41	-39	-44	-52	-59	-63	-68	22
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [4.9 m²]	7	7	7	7	7	7	7	
Element sound level contribution	38	32	25	19	14	9.2	-0.3	
Element 2 ,Glazing 3mm STL	-14	-19	-20	-26	-30	-34	-23	17
Facade Shape Level diff.	0	0	0	0	0	0	0	
Area (+10Log A) [0.8 m²]	-1	-1	-1	-1	-1	-1	-1	
Element sound level contribution	34	25	22	12	4.7	-2	1.9	
Receiver								
Room volume (-10Log V) [19 m³]	-13	-13	-13	-13	-13	-13	-13	17
Reverberation time (s)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
RT (+10Log T)	-4	-4	-4	-4	-4	-4	-4	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	34	25	23	12	4.7	-2	1.9	