

Noise impact assessment of a proposed residential development

25 Henley Wood Road, Earley, Wokingham



Client: JLT Property Limited

Report Reference: 250213-R001

Date: 12th March 2025

Revision:	Date:	Author:	Checked:
-	12/03/2025	Tommy Burn BSc (Hons) MIOA	Rob Cant MIOA MEnvSc

This report has been prepared by ACA Acoustics Limited (ACA) with all reasonable skill, care, and diligence in accordance with generally accepted acoustic consultancy principles and taking account of the services and terms agreed between ACA and our client. Any information provided by third parties and referred to herein may not have been checked or verified by ACA unless expressly stated otherwise. Certain statements made in the report may constitute estimates or projections and even though these are based on reasonable assumptions and good industry practice, such forward-looking statements by their nature involve risks and uncertainties which could cause actual results to differ materially from the results predicted. ACA does not guarantee or warrant any estimate or projection contained in this report.

Note that consideration of non-acoustic aspects including, but not limited to structural calculations, compliance with Building Regulations and other statutory requirements, or any assessment of fire regulations are outside the scope of ACA Acoustics Limited and should be considered by others accordingly.

This report is confidential to the client and ACA accepts no responsibility whatsoever to third parties unless formally agreed by ACA. Any such party relies upon the report at their own risk. © 2025 ACA Acoustics Limited.

CONTENTS

0. SUMMARY	2
1. INTRODUCTION	3
2. ACOUSTIC CRITERIA	3
2.1. Wokingham Borough Council Planning Condition 4	3
2.2. British Standard BS 8233:2014.....	3
2.3. The Building Regulations Approved Document O.....	4
3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS	6
4. SOUND LEVEL SURVEY	7
5. ACOUSTIC ASSESSMENT.....	9
5.1. External Façade Elements	9
5.2. Ventilation Strategy	10
5.3. Acoustic Assessment Internal Sound Level Results	10
5.4. External Amenity Area Noise Assessment	11
6. CONCLUSION.....	11
Appendix A.....	A

0. SUMMARY

- 0.1. ACA Acoustics Limited has been commissioned to assess the acoustic impact of existing noise sources on a proposed new residential development at 25 Henley Wood Road, Earley, Wokingham. The assessment has been prepared to discharge a planning condition for the development issued by the Local Planning Authority, Wokingham Borough Council.
- 0.2. A sound level survey has been carried out in the vicinity between the 26th – 27th February 2025. Whilst on site ACA Acoustics' consultant considered the dominant sound source to be rail traffic from the adjoining railway line, along with traffic on nearby routes including the A3290 to the north.
- 0.3. Summary results of the sound level survey to the most noise-affected façade of the development are shown in the table below.

Location	Daytime (07:00 – 23:00) LAeq	Night-Time (23:00 – 07:00) LAeq	Night-Time (23:00 – 07:00) Typical LAfmax
Rear façade overlooking the nearby railway line	66dB	62dB	85dB

Table 1: Summary sound level survey results

- 0.4. A scheme for sound insulation of the building envelope has been developed such that internal sound levels meet the guideline limits for a good standard of amenity to living rooms and bedrooms set out in BS 8233:2014. Details of the sound insulation and mitigation scheme are provided within this report.
- 0.5. In conclusion, with benefit of the acoustic façade treatments proposed within this report then internal sound levels will meet guideline limits set out within BS 8233:2014 and Condition 4 for the development may be discharged.

1. INTRODUCTION

A planning application is to be submitted for a new residential development at 25 Henley Wood Road, Earley, Wokingham.

ACA Acoustics Limited has been commissioned by JLT Property Limited to carry out a survey and assessment of external sound levels in the vicinity of a proposed residential development at 25 Henley Wood Road, Earley, Wokingham and, where necessary, to make recommendations for a suitable mitigation scheme such that Condition 4 of the decision notice for the development may be discharged.

2. ACOUSTIC CRITERIA

2.1. Wokingham Borough Council Planning Condition 4

Wokingham Borough Council have issued Planning Condition 4 with regards to noise impacting the proposed development:

“Condition 4 : Sound insulation details

Prior to the commencement of the development, a scheme for protecting the proposed dwelling from noise from the railway line shall be submitted to and approved by the local planning authority. All works which form part of the scheme shall be completed before the dwelling is occupied.

Reason: To ensure satisfactory noise attenuation measures are installed. Relevant policy: NPPF Section 15 (Conserving and Enhancing the Natural Environment), Core Strategy policies CP1 and CP3 and Managing Development Delivery Local Plan policy CC06.”

2.2. British Standard BS 8233:2014

The introduction to BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* advises that *“this guide suggests criteria, such as suitable sleeping/resting conditions, and proposes noise levels that normally satisfy these criteria”*. As such it is considered that guideline noise limits set out in BS 8233:2014 are suitable to protect future occupants of the dwelling from noise disturbance and compliance with these values would ensure sound levels within the new development are below the Lowest Observed Adverse Effect Level and comply with the principles of the NPPF, NPSE and PPG-N, and are suitable to assess the potential noise impact, as required by the Local Authority.

Guidance limits for internal sound levels within living rooms and bedrooms, taken from Table 4 of BS 8233:2014, are shown in Table 2 below.

Activity	Location	Daytime 07:00 – 23:00	Night-Time 23:00 – 07:00
Resting	Living Room	LAeq, 16-hour 35dB	-
Dining	Dining Room/Area	LAeq, 16-hour 40dB	-
Sleeping (daytime resting)	Bedroom	LAeq, 16-hour 35dB	LAeq, 8-hour 30dB

Table 2: BS 8233:2014 indoor ambient sound levels for dwellings

The above criteria are generally considered suitable for noise from traffic and other ‘anonymous’ sources. The accompanying notes to Table 4 in BS 8233:2014 confirm that the levels can be relaxed by 5dB and still achieve a reasonable level of amenity.

2.3. The Building Regulations Approved Document O

Although not applicable to planning matters, it is beneficial to consider the impact of how complying with The Building Regulations Approved Document O will affect the ventilation strategy.

Requirement O1 of Schedule 1 to The Building Regulations 2010 requires that the following is met.

Requirement	
Requirement	Limits on application
O1 Overheating mitigation	
(1) Reasonable provision must be made in respect of a dwelling, institution or any other building containing one or more rooms for residential purposes, other than a room in a hotel (“residences”) to—	
(a) limit unwanted solar gains in summer;	
(b) provide an adequate means to remove heat from the indoor environment.	
(2) In meeting the obligations in paragraph (1)—	
(a) account must be taken of the safety of any occupant, and their reasonable enjoyment of the residence; and	
(b) mechanical cooling may only be used where insufficient heat is capable of being removed from the indoor environment without it.	

Figure 1: Requirement O1 of The Building Regulations 2010

The aim of Requirement O1 is to protect the health and welfare of the occupants of residential buildings, by reducing the occurrence of high indoor temperatures.

Where practical, this should be achieved through limiting solar gains through the design of the building and façade elements. Excess heat should then be removed through opening windows, ventilation louvres in external walls, a mechanical ventilation system, or a mechanical cooling system. Paragraph 2.11 of Approved Document O confirms that *“The building should be constructed to meet requirement O1 using passive means as far as reasonably practicable”*.

However, requirement O1(2)(a) requires that any successful overheating mitigation strategy must also consider other potential adverse impacts, including sound levels inside bedrooms at night.

Paragraphs 3.2 and 3.3 consider the impact of noise on the overheating strategy. These have been included below.

- 3.2 *In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*
- 3.3 *Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.*
- a. 40dB LAeq, T averaged over 8 hours (between 11pm and 7am).*
 - b. 55dB LAfmax more than 10 times a night (between 11pm and 7am).*

The Association of Noise Consultants have issued guidance on complying with the requirements of Approved Document O. They recommend that a 10dB open window loss is suitable for most areas.

On this basis, where sound levels incident on a bedroom window do not exceed LAeq, 8-hour 50dB and LAfmax 65dB more than 10 times per night, then the criteria in paragraph 3.3 of Approved Document O should be achieved and an overheating mitigation strategy allowing for open windows is appropriate.

If external sound levels exceed these levels then it is likely windows will be closed by occupants overnight. Note that this does not mean that windows should be sealed closed as most residents would desire the choice of whether to open windows or not. For example, a resident may choose to open windows to a bedroom to help mitigate overheating to the property whilst the bedroom is not in use during the daytime, then close the windows when sleeping in the bedroom overnight.

In accordance with The Building Regulations Approved Document F, it is recommended that if continuous mechanical ventilation is used, sound levels in bedrooms overnight should not exceed a level of LAeq 30dB when the system is operating at its minimum low rate. Although, evidence referenced in The Association of Noise Consultants' *Acoustics Ventilation and Overheating: Residential Design Guide*, notes that *“a more prudent limit for mechanical services noise around 24-26dBA is likely to be required to prevent an adverse reaction from most occupants while falling asleep”*.

3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS

The proposals are for a new residential development comprising 2 new flats with associated parking and external amenity space. The site is currently open land within a wider residential area.

Henley Wood Road runs to the southern boundary of the site, and the A3290 to the north. In addition a railway line runs directly adjoining the site to the north. Beyond these, the surrounding areas to all sides are of residential dwellings.

The acoustic climate predominantly comprises road and rail traffic activity. The A3290 is a busy A road, and trains pass regularly on the adjoining railway line at fairly high speeds.

A marked-up aerial image is included in Figure 2, identifying the existing site and surrounding area, along with the sound level survey measurement position.

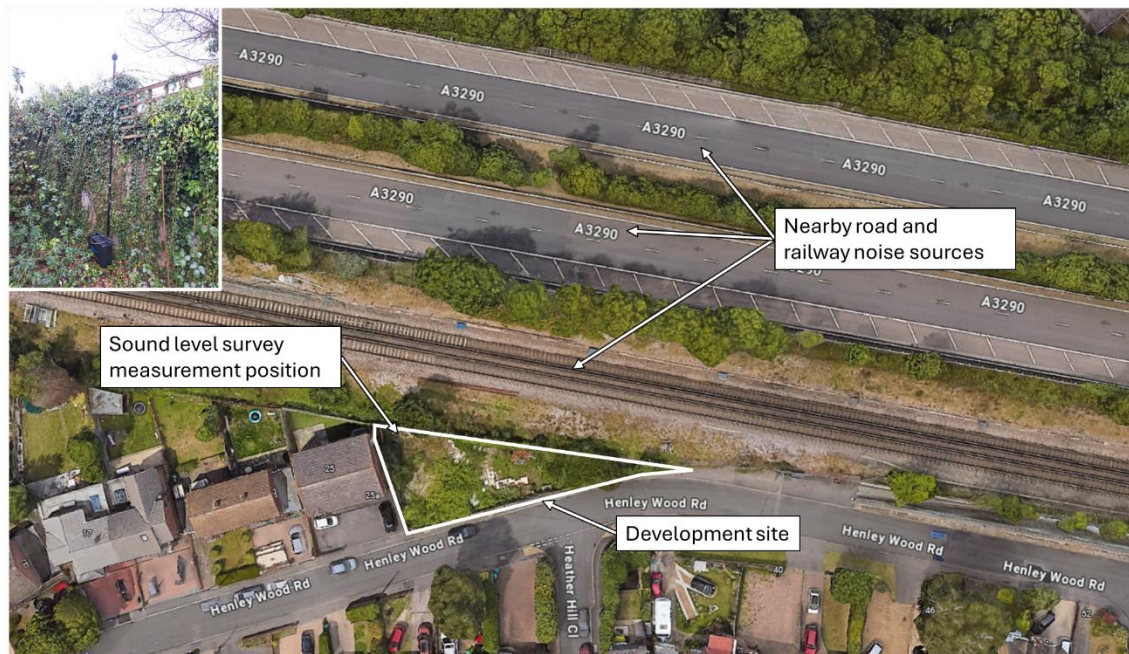


Figure 2: Site location plan (available at www.google.com/maps)

A site location plan, showing the proposed dwellings, is included in Figure 3 below.

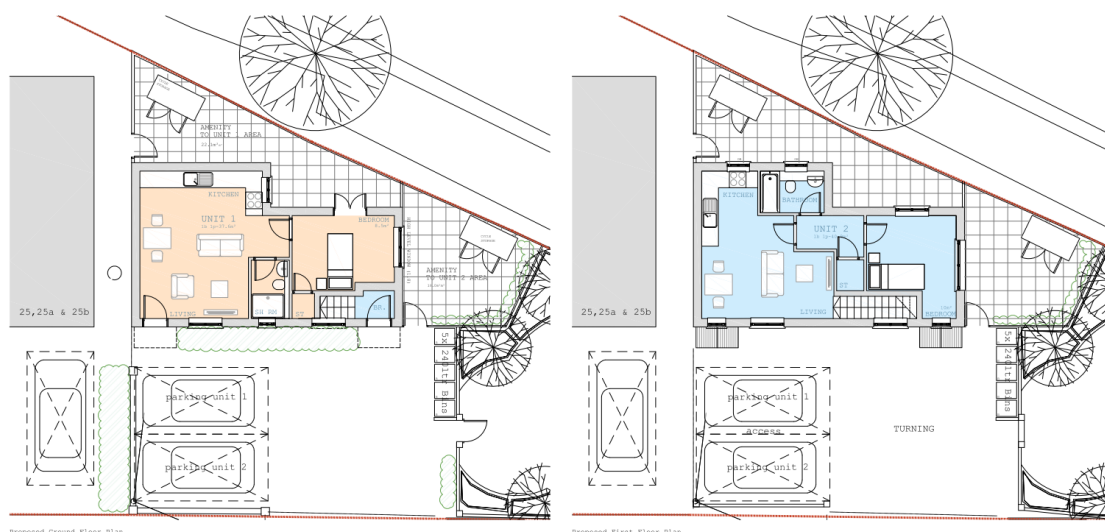


Figure 3: Proposed layout for the new development

4. SOUND LEVEL SURVEY

To assess the impact of existing sound sources, a survey has been conducted at the development site to determine sound levels incident on the proposed residential dwellings.

The sound level survey was set up by Tommy Burn of ACA Acoustics and carried out over nominally a 24-hour period between 26th and 27th February 2025.

A single measurement position was used for the survey. The measurement position was to the north boundary of the site at high-level overlooking the railway line and A3290.

During the survey, the soundscape in the vicinity was influenced predominantly by road and rail traffic from the railway line and A3290 to the north.

The following equipment was used during the survey. An on-site calibration check was conducted on the sound level meter prior to the survey and repeated after with no deviation noted.

Equipment	Serial Number
NTi Audio Class 1 sound level meter type XL2-TA complete with weatherproof and lockable outdoor environmental kit	A2A-10964-E0
Svante kalibrator type SV33B. Compliant to IEC 60942-1:2003	83826

Table 3: Equipment used for the sound level survey

Weather conditions at the time of setting up the survey were cool, bright, and clear. Weather conditions have been reviewed at www.worldweatheronline.com, using the closest available commercial weather station. Weather conditions remained predominantly calm and dry with wind speeds below recommended limits during the proposed equipment operation times. Meteorological conditions are considered acceptable and will not have adversely impacted the survey results.

Results of the survey are shown in graphical form in Figure 4 below.

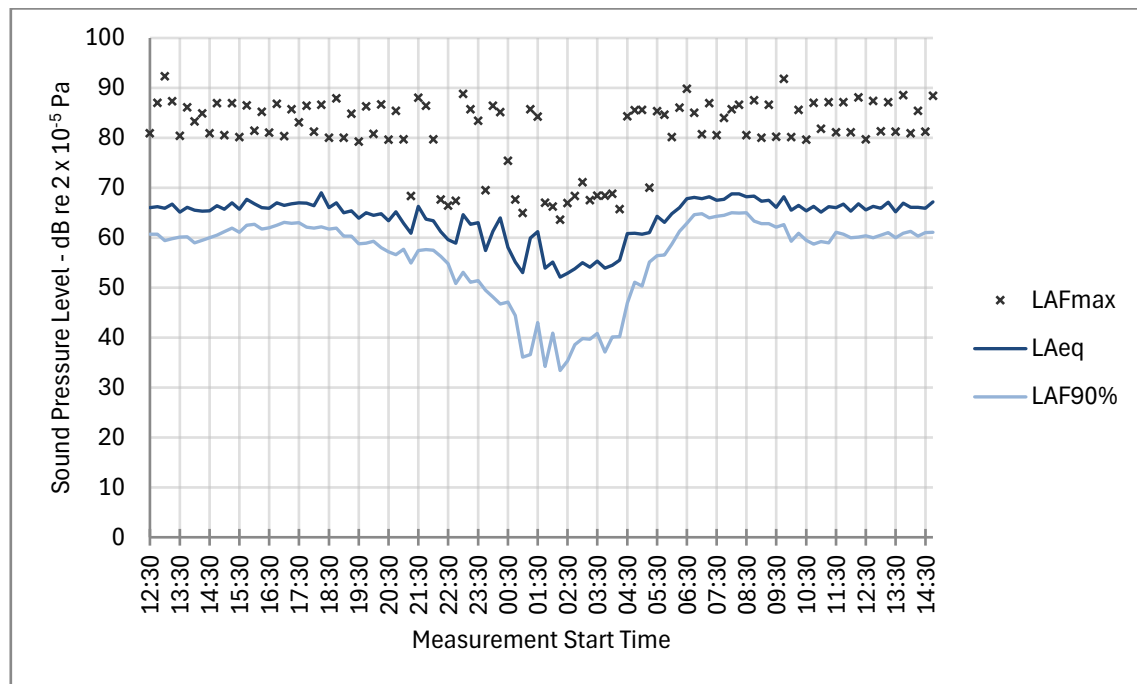


Figure 4: Sound level survey results – 26th – 27th February 2025

Sound level measurements during the daytime and early and late-night periods are dominated by railway activity, as can be seen from the measured LAFmax data

Summary results of the daytime and night-time sound level results are provided in Table 4 below.

Assessment Location	Daytime (07:00 – 23:00) LAeq	Night-Time (23:00 – 07:00) LAeq	Night-Time (23:00 – 07:00) Typical LAFmax
MP1	66dB	62dB	85dB

Table 4: Summary sound level survey results

5. ACOUSTIC ASSESSMENT

5.1. External Façade Elements

A scheme for sound insulation is necessary to ensure sound levels inside rooms of the new development are reasonable and comply with the requirements of BS 8233:2014.

A computer model has been set up using the sound levels incident on the façade of the development along with anticipated façade elements. The computer model is based on the calculation procedures outlined in BS EN ISO 12354-3:2000 and BS 8233:2014.

The assessment is based on the drawing reference 818-02-30, provided by the client. Confirmation of the acoustic performance of the building envelope elements used in the calculation model is provided below.

Description	R _w (dB)	R _w + C' _{tr} (dB)	Typical Construction
Façade walls	52	48	Traditional cavity masonry construction or similar
Glazing to North and East living room windows	43	36	Double glazing such as 4-16-6 configuration or equivalent
Glazing to North and East bedroom windows	49	45	Secondary glazing such as 10-200-6 configuration or equivalent
Glazing to South windows (All habitable rooms)	41	36	Laminated double glazing such as 6.5-12-8.38 configuration or equivalent
Roof	56	49	Pitched tile/slate roof with flat plasterboard ceiling comprising 2 layers 12.5mm wallboard on resilient isolation clips such as Pliteq GenieClips RST or equivalent, Minimum 100mm dense mineral wool insulation in the loft cavity

Table 5: Acoustic performance specification for façade elements

Note that the constructions provided are typical and variations on the specification would be acceptable, so long as the installed construction achieved the specified sound insulation performance. The specification for glazed elements is for the window/door as a complete unit, including frames and seals. It is recommended the glazing supplier submit test data confirming their unit will comply with the specified performance.

5.2. Ventilation Strategy

BS 8233:2014 requires that internal sound level criteria are achieved whilst providing the ‘*whole dwelling ventilation*’ rate as set out in The Building Regulations Approved Document F.

It is usual to satisfy internal sound level criteria whilst achieving the background ventilation rate defined by Approved Document F of the Building Regulations, rather than for the purge ventilation rate. It is therefore anticipated that it will be necessary to incorporate an acoustic ventilation scheme into the design such that residents can achieve background ventilation without necessarily needing to open windows.

Values in Table 6 below show a specification schedule of ventilator sound insulation performance for the development, used in the computer model. Note that there are many different passive ventilators including through-wall type and those built into the window frame. If the $D_{n,e,w}$ performance is not lower than that shown Table 6 then any alternative ventilator may be used.

It is recommended that living rooms and bedrooms to the proposed development incorporate mechanical ventilation such as MVHR or similar, allowing occupants to achieve appropriate ventilation rates without the need to open windows if they chose not to. Suitable mechanical ventilation systems should incorporate a summer bypass mode and boost functions. Noise intrusion via the ducted system and self-noise from the fan should not exceed a level of L_{Aeq} 25dB inside habitable rooms.

Description	Location	$D_{n,e,w}$ (dB)	Typical Ventilator Type
Mechanical Vent	Habitable rooms to the proposed development	-	MVHR or similar with boost function and summer bypass mode

Table 6: Specification for ventilator acoustic performance

In accordance with Approved Document O of The Building Regulations, if sound levels inside bedrooms exceed $L_{Aeq, 8-hour}$ 40dB or L_{Amax} 55dB more than 10 times per night, then it would not be appropriate to rely on open windows to mitigate overheating. Incorporating the MVHR system will allow future occupants to mitigate overheating to bedrooms at night whilst not needing to open their windows. Detailed thermal design, confirming the ventilation strategy, is beyond the scope of this assessment and should be considered by others accordingly.

5.3. Acoustic Assessment Internal Sound Level Results

Summary results from the calculation model to sample receptors are confirmed in Table 7 **Error! Reference source not found.** below. The sample receptors selected are considered the likely most noise-affected properties/rooms; sound levels to other rooms will be lower. This demonstrates that sound levels within rooms of the proposed residential units will comply with guidance limits in BS 8233:2014. Printouts from the computer model are included in Appendix A.

Plot/Room	Description	Calculated Internal Sound Level	Criteria
Unit 2 Living Room	Daytime LAeq	31dBA	≤35dBA
	Night-Time LAeq	-	-
	Night-Time LAfmax	-	-
Unit 2 Bedroom	Daytime LAeq	30dBA	≤35dBA
	Night-Time LAeq	24dBA	≤30dBA
	Night-Time LAfmax	45dBA	≤45dBA

Table 7: Summary internal sound levels within sample habitable rooms

5.4. External Amenity Area Noise Assessment

The proposed development includes private gardens to the rear and side facades.

Sound levels measured at high level overlooking the trainline and road are LAeq 66dB during the daytime. A line-source distance correction and Maekawa screening calculation have been undertaken on this value, and external sound levels within the garden spaces should not exceed LAeq 55dB as recommended in BS 8233:2014 and discussed in Section 2.2.

No further mitigation is required to protect the amenity of residents using these amenity spaces.

6. CONCLUSION

Planning consent has been granted with conditions for a new residential development at 25 Henley Wood Road, Earley, Wokingham. Condition 4 of the Decision Notice relates to noise from the adjacent transport noise sources.

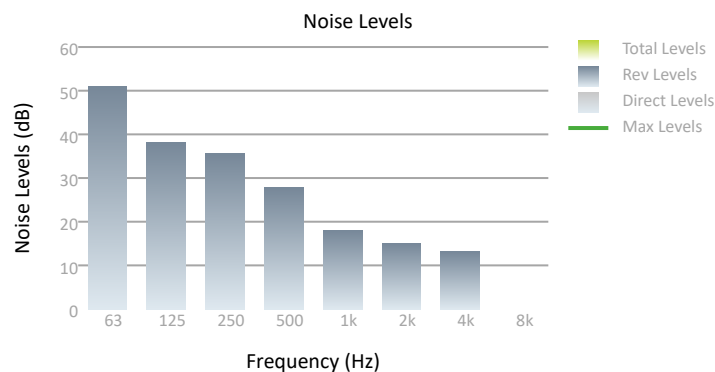
ACA Acoustics have undertaken a sound level survey in the vicinity. Allowing for the benefit of the acoustic specification of façade elements shown in this report, calculated internal sound levels within habitable rooms will comply with recommended criteria set out in BS 8233:2014, ensuring a good standard of amenity for future occupants.

It is recommended that Condition 4 of the Decision Notice for the development may be discharged.

Appendix A

Acoustic Calculations

Reference	Unit 2 First Floor Livingroom
Description	
Target Sound Level	-
Max Sound Level	-
Calculated Sound Level	31.4dB(A)
Calculated Tmf T60 (s)	0.5
Volume (m ³)	48



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	39.0	28.3	22.9	15.7	12.1	10.5	9.8	-
Leq, ff (Day)	1	50.8	37.7	35.3	27.5	16.8	13.2	10.5	9.2

Reference

Unit 2 First Floor Bedrom Daytime LAeq

Description

Target Sound Level

Max Sound Level

Calculated Sound Level

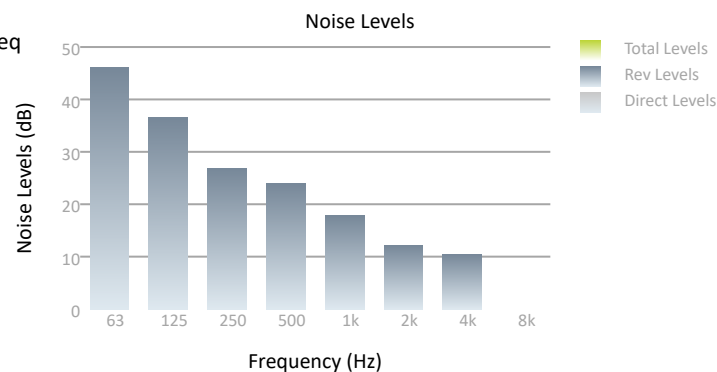
-

Calculated Tmf T60 (s)

0.4

Volume (m³)

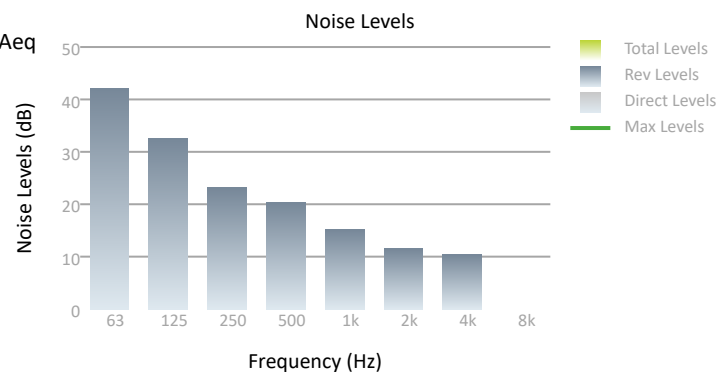
21



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Day)	1	45.6	36.1	25.7	23.6	17.4	11.0	9.0	8.7
Leq, ff (Day)	1	36.5	26.1	20.8	12.4	8.1	6.1	5.2	-

Reference	Unit 2 First Floor Bedrom Nighttime LAeq
Description	
Target Sound Level	-
Max Sound Level	-
Calculated Sound Level	23.6dB(A)
Calculated Tmf T60 (s)	0.4
Volume (m ³)	21



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Leq, ff (Night)	1	41.6	32.1	21.9	19.9	14.4	10.1	8.8	8.7
Leq, ff (Night)	1	32.5	22.2	17.1	9.9	7.2	5.9	5.1	-

Reference

Unit 2 First Floor Bedrom Nighttime LAFmax

Description

Target Sound Level

-

Max Sound Level

-

Calculated Sound Level

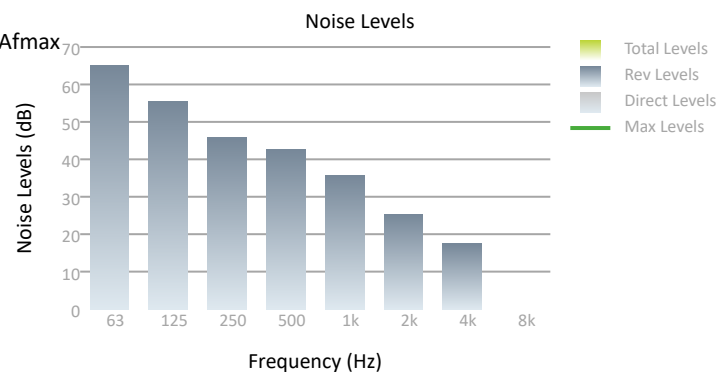
45.4dB(A)

Calculated Tmf T60 (s)

0.4

Volume (m³)

21



Calculated Internal Sound Levels

Reference	Quantity	Noise Levels (dB)							
		63	125	250	500	1k	2k	4k	8k
Lmax, ff (Night)	1	64.6	55.1	44.6	42.4	35.6	25.0	17.0	10.3
Lmax, ff (Night)	1	55.5	45.1	39.6	29.9	22.4	14.4	6.7	-

Calculation Sheet

Unit 2 First Floor Livingroom

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade										
Source dBA	56.0									
Octave Band Frequencies										
Leq,ff		60.0	58.0	54.0	52.0	52.0	48.0	43.0	37.0	Row A
Facade Wall Element										
		-41.0	-44.0	-48.0	-48.0	-57.0	-61.0	-63.0	-68.0	
Facade Glazed Element										
		-32.9	-39.9	-39.9	-49.9	-55.9	-59.9	-73.9	-	
Facade Roof Element										
		-33.6	-52.6	-56.6	-65.6	-72.6	-71.6	-79.6	-86.6	
Cumulative Lp										
Result		30.1	19.8	15.1	7.9	4.4	3.3	3.0	-	
ISO 12354-3 Lfs Correction										
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections										
		8.9	8.5	7.7	7.7	7.7	7.3	6.8	-	
Internal Receiver Noise										
Internal Receiver Noise - Unit 2 First Floor Livingroom										
Reverberant Field, LPrev:		39.0	28.3	22.9	15.7	12.1	10.5	9.8	-	

Calculation Sheet

Unit 2 First Floor Bedrom Daytime LAeq

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	66.0									
Octave Band Frequencies										
Leq,ff		70.0	68.0	64.0	62.0	62.0	58.0	53.0	47.0	Row A
Facade Wall Element										
		-39.6	-42.6	-46.6	-46.6	-55.6	-59.6	-61.6	-66.6	
Facade Glazed Element										
		-37.2	-44.2	-55.2	-55.2	-55.2	-65.2	-74.2	-79.2	
Facade Roof Element										
		-37.2	-56.2	-60.2	-69.2	-76.2	-75.2	-83.2	-90.2	
Cumulative Lp										
Result		36.9	27.8	18.2	16.2	10.5	4.6	3.3	3.0	
ISO 12354-3 Lfs Correction										
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections										
		8.7	8.3	7.4	7.4	6.9	6.4	5.7	5.7	
Internal Receiver Noise										
Internal Receiver Noise - Unit 2 First Floor Bedrom Daytime LAeq Reverberant Field, LPrev:										
		45.6	36.1	25.7	23.6	17.4	11.0	9.0	8.7	

Calculation Sheet

Unit 2 First Floor Bedrom Nighttime LAeq

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Sound Level at Facade (Nighttime Leq)									
Source dBA	62.0								
Octave Band Frequencies									
Leq,ff		66.0	64.0	60.0	58.0	58.0	54.0	49.0	43.0
Row A									
Facade Wall Element									
		-39.6	-42.6	-46.6	-46.6	-55.6	-59.6	-61.6	-66.6
Facade Glazed Element									
		-37.2	-44.2	-55.2	-55.2	-55.2	-65.2	-74.2	-79.2
Facade Roof Element									
		-37.2	-56.2	-60.2	-69.2	-76.2	-75.2	-83.2	-90.2
Cumulative Lp									
Result		32.9	23.8	14.4	12.5	7.5	3.7	3.1	3.0
ISO 12354-3 Lfs Correction									
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Room Corrections									
		8.7	8.3	7.4	7.4	6.9	6.4	5.7	5.7
Internal Receiver Noise									
Internal Receiver Noise - Unit 2 First Floor Bedrom Nighttime LAeq									
Reverberant Field, LPrev:		41.6	32.1	21.9	19.9	14.4	10.1	8.8	8.7

Calculation Sheet

Unit 2 First Floor Bedrom Nighttime LAfmax

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Sound Level at Facade (Nighttime Lmax)									
Source dBA	85.0								
Octave Band Frequencies									
Leq,ff		89.0	87.0	83.0	81.0	81.0	77.0	72.0	66.0
		Row A							
Facade Wall Element									
		-39.6	-42.6	-46.6	-46.6	-55.6	-59.6	-61.6	-66.6
Facade Glazed Element									
		-37.2	-44.2	-55.2	-55.2	-55.2	-65.2	-74.2	-79.2
Facade Roof Element									
		-37.2	-56.2	-60.2	-69.2	-76.2	-75.2	-83.2	-90.2
Cumulative Lp									
Result		55.9	46.8	37.1	35.0	28.6	18.7	11.3	4.7
ISO 12354-3 Lfs Correction									
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Room Corrections									
		8.7	8.3	7.4	7.4	6.9	6.4	5.7	5.7
Internal Receiver Noise									
Internal Receiver Noise - Unit 2 First Floor Bedrom Nighttime LAfmax									
Reverberant Field, LPrev:		64.6	55.1	44.6	42.4	35.6	25.0	17.0	10.3

Calculation Sheet

Unit 2 First Floor Livingroom

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade										
Source dBA	66.0									
Octave Band Frequencies										
Leq,ff		70.0	68.0	64.0	62.0	62.0	58.0	53.0	47.0	Row A
Facade Wall Element										
		-40.7	-43.7	-47.7	-47.7	-56.7	-60.7	-62.7	-67.7	
Facade Glazed Element										
		-29.9	-40.9	-36.9	-43.9	-57.9	-56.9	-58.9	-66.9	
Facade Roof Element										
		-33.6	-52.6	-56.6	-65.6	-72.6	-71.6	-79.6	-86.6	
Cumulative Lp										
Result		41.9	29.1	27.5	19.7	9.1	5.9	3.7	3.1	
ISO 12354-3 Lfs Correction										
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections										
		8.9	8.5	7.7	7.7	7.7	7.3	6.8	6.2	
Internal Receiver Noise										
Internal Receiver Noise - Unit 2 First Floor Livingroom										
Reverberant Field, LPrev:		50.8	37.7	35.3	27.5	16.8	13.2	10.5	9.2	

Calculation Sheet

Unit 2 First Floor Bedrom Daytime LAeq

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Daytime Leq)										
Source dBA	56.0									
Octave Band Frequencies										
Leq,ff		60.0	58.0	54.0	52.0	52.0	48.0	43.0	37.0	Row A
Facade Wall Element										
		-41.4	-44.4	-48.4	-48.4	-57.4	-61.4	-63.4	-68.4	
Facade Glazed Element										
		-30.6	-37.6	-37.6	-47.6	-53.6	-57.6	-71.6	-	
Facade Roof Element										
		-33.6	-52.6	-56.6	-65.6	-72.6	-71.6	-79.6	-86.6	
Cumulative Lp										
Result		31.4	21.4	16.9	8.5	4.7	3.3	3.0	-	
ISO 12354-3 Lfs Correction										
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections										
		5.1	4.8	3.9	3.9	3.4	2.8	2.1	-	
Internal Receiver Noise										
Internal Receiver Noise - Unit 2 First Floor Bedrom Daytime LAeq Reverberant Field, LPrev:										
		36.5	26.1	20.8	12.4	8.1	6.1	5.2	-	

Calculation Sheet

Unit 2 First Floor Bedrom Nighttime LAeq

		Octave Band Centre Frequency (Hz)								
		63	125	250	500	1k	2k	4k	8k	
Sound Level at Facade (Nighttime Leq)										
Source dBA	52.0									
Octave Band Frequencies										
Leq,ff		56.0	54.0	50.0	48.0	48.0	44.0	39.0	33.0	Row A
Facade Wall Element										
		-41.4	-44.4	-48.4	-48.4	-57.4	-61.4	-63.4	-68.4	
Facade Glazed Element										
		-30.6	-37.6	-37.6	-47.6	-53.6	-57.6	-71.6	-	
Facade Roof Element										
		-33.6	-52.6	-56.6	-65.6	-72.6	-71.6	-79.6	-86.6	
Cumulative Lp										
Result		27.4	17.5	13.2	6.0	3.8	3.1	3.0	-	
ISO 12354-3 Lfs Correction										
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections										
		5.1	4.8	3.9	3.9	3.4	2.8	2.1	-	
Internal Receiver Noise										
Internal Receiver Noise - Unit 2 First Floor Bedrom Nighttime LAeq Reverberant Field, LPrev:										
		32.5	22.2	17.1	9.9	7.2	5.9	5.1	-	

Calculation Sheet

Unit 2 First Floor Bedrom Nighttime LAfmax

		Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Sound Level at Facade (Nighttime Lmax)									
Source dBA	75.0								
Octave Band Frequencies									
Leq,ff		79.0	77.0	73.0	71.0	71.0	67.0	62.0	56.0
		Row A							
Facade Wall Element									
		-41.4	-44.4	-48.4	-48.4	-57.4	-61.4	-63.4	-68.4
Facade Glazed Element									
		-30.6	-37.6	-37.6	-47.6	-53.6	-57.6	-71.6	-
Facade Roof Element									
		-33.6	-52.6	-56.6	-65.6	-72.6	-71.6	-79.6	-86.6
Cumulative Lp									
Result		50.4	40.3	35.8	26.1	19.0	11.6	4.5	-
ISO 12354-3 Lfs Correction									
		0.0	0.0	0.0	0.0	0.0	0.0	0.0	-
Room Corrections									
		5.1	4.8	3.9	3.9	3.4	2.8	2.1	-
Internal Receiver Noise									
Internal Receiver Noise - Unit 2 First Floor Bedrom Nighttime LAfmax									
Reverberant Field, LPrev:		55.5	45.1	39.6	29.9	22.4	14.4	6.7	-