

Acoustic South East



Planning Noise Assessment

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Date: 21/04/2026

Project: J4113

Issue 1

Site: **57 Broadway, Haywayrds Heath. RH16 3AS**

Client: **Roblewood Projects Limited**

Contents

1	Introduction and Executive Summary	- 4 -
2	Context, Noise Criteria & Noise Assessment Methodology	- 5 -
2.1	Context	- 5 -
2.2	Site Location	- 5 -
2.3	Commercial Setting	- 6 -
2.4	Existing Floor Plans	- 7 -
2.5	Proposed Floor Plans	- 9 -
2.6	Discussion of Plans	- 10 -
2.7	Precedent for Residential Developments/Extension to the Rear	- 11 -
2.8	Soundscape.....	- 11 -
3	Relevant Policies and Standards	- 12 -
3.1	National Planning Policy Framework (NPPF-2024).....	- 12 -
3.2	BS8233:2014 Noise Criteria	- 12 -
3.3	ProPG2017 - Professional Practice Guidance on Planning & Noise	- 13 -
3.4	Planning Noise Advice Document Sussex November 2024	- 13 -
3.5	Building Regulations – Approved Document E – Resistance to the Passage of Sound.....	- 13 -
3.6	Building Regulations – Approved Document O – Overheating	- 13 -
4	Methodology	- 14 -
5	Sound Survey(s)	- 14 -
6	Results of the Sound Survey	- 15 -
6.1	Front Elevation (The Broadway)	- 15 -
6.2	Rear Elevation (Freefield)	- 16 -
6.3	Attended Measurement.....	- 16 -
7	Discussion	- 17 -
7.1	Calculation of the Sound Reduction Index (SRI).....	- 17 -
7.2	Assessment of External Amenity Spaces.....	- 18 -
7.3	ProPG2017 Initial Site Risk Assessment.....	- 19 -
7.4	Simplified Overheating Assessment	- 20 -
7.5	Rigorous Calculations.....	- 21 -
7.6	Separation of Commercial and Residential Demises	- 22 -
8	Recommendations	- 26 -
8.1	Glazing.....	- 26 -
8.2	Ventilation.....	- 26 -
8.3	Separation between Commercial and Residential Spaces.....	- 27 -
9	Conclusion	- 27 -

10	Appendix A – Rigorous Calculations	- 28 -
11	Appendix B – INSUL Wall Build Up (Timber Frame-New Build Rear Extension)	- 39 -

Tables

Table 1. BS8233:2014 Criteria	- 12 -
Table 2. Survey Details	- 14 -

Figures

Figure 1. Site Location	- 6 -
Figure 2. Existing Lower Ground Floor and Ground Floor	- 7 -
Figure 3. Existing First and Second Floors	- 8 -
Figure 4. Proposed Lower Ground Floor and Ground Floors	- 9 -
Figure 5. Proposed First and Second Floors	- 9 -
Figure 6. Render of Rear of Premises	- 10 -
Figure 7. Images of Survey Location(s) Front and Rear	- 15 -
Figure 8. Front Facade -The Broadway (Albeit in Freefield Conditions)	- 15 -
Figure 9. LT2 Data (Freefield)	- 16 -
Figure 10. Sound Reduction Index of Kitchen Living Diners	- 17 -
Figure 11. Sound Reduction Index of Bedrooms	- 18 -
Figure 12. Rear Terrace Locations	- 18 -
Figure 13. ProPG2017 Initial Site Risk Assessment	- 19 -
Figure 14. Window Opening - Equivalent Areas	- 20 -
Figure 15. Outcomes of Rigorous Calculations	- 21 -
Figure 16. Basement Wall - Option 1	- 22 -
Figure 17. Basement Wall- Option 2	- 23 -
Figure 18. Party Ceiling/Floor- Ground to First-Option 1	- 24 -
Figure 19. Party Ceiling/Floor- Ground to First- Option 2	- 25 -
Figure 20. Rtraffic Glazing Solutions	- 26 -

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Issue 1	21/04/2026	Original Issue
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1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment to support a planning application for changes to 57 The Broadway, Haywards Heath. Specifically, the changes include a reconfiguration of residential accommodation at existing first and second floors as well as a new build extension to the rear occurring at lower ground and ground floors.

Standards and guidance referenced for this assessment include:

- BS8233:2014 - Guidance on Sound Insulation and Noise Reduction for Buildings
- National Planning Policy Framework (NPPF), 2024
- ProPG2017 – Professional Practice Guidance on Planning & Noise
- Building Regulations, Approved Document E – Resistance to the Passage of sound
- Building Regulations, Approved Document O – Overheating
- Planning and Noise Advice Document Sussex, November 2023
- Association of Noise Consultants (ANC) – Approved Document O Noise Guide version 1.1, November 2024.

The site soundscape was measured using two class 1 unattended sound level meters between 12-17th November 2025. These were placed at the front and rear of the premises and additional attended measurements were undertaken to understand how the site soundscape differs. The noisier façade is that of the Broadway which is dominated by road traffic noise. Railway noise is noted to the rear. The survey data obtained was consistent with other Acoustic South East measurements made in the immediate area.

Contextually, there is already residential accommodation at first and second floors of 57 The Broadway. These remain, as does the lower ground floor and ground floor proposed commercial uses.

It is also noted that there have been recent planning approvals for residential developments at the site which demonstrate a precedent for additional residential development in the immediate area, albeit, placed onto the quieter façade closer to the railway line. The new build lower ground and ground floors are protected from the noisier façade by the massing of the existing building and experience a relatively low site soundscape for the daytime and night time periods.

Good acoustic design has been taken into account to ensure that the placement of sensitive living spaces such as bedrooms are located at quieter facades.

A ProPG2017 initial site risk assessment identified the site as low to medium risk.

Proposed external amenity areas located at the rear facade have also been assessed and are below the upper limits contained within BS8233:2014 and ProPG2017 (ie 55dB L_{Aeq,16 hour}).

The client has also acknowledged the requirement for an enhanced separation between commercial and residential spaces and proposed solutions to ensure that future occupants remain protected from adverse noise levels.

Based on the information above, planning permission should not be withheld on noise grounds.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

This assessment supports a detailed application being made to Mid Sussex District Council (MSDC). The plans have had pre-application advice from MSDC.

57 The Broadway is located within a commercial terrace of properties in Haywards Heath, with the B2028/The Broadway Road located to the front of the premises and the railway line located to the rear of the premises.

The railway line is located in a cutting and whilst audible, it was not possible when stood at the northern boundary to see the train passes. Haywards Heath train station is located approximately 420m due North. To the South the railway line enters a tunnel. The separation of Network Rail land and the client land is via a metal chainlink fence.

Presently, the site is a commercial premises at ground floor, with 1 residential unit on the site.

The proposal is for the commercial ground floor to remain, with the site reconfigured to accommodate 5 residential flats. The reconfiguration includes a new rear extension and also a revised second floor.

No plant is proposed at the site and the existing plant serving the building will be removed.

The aim of the assessment is to characterise the site soundscape in terms of noise levels incident on the front and rear facades and to support a planning application.

2.2 Site Location

The application site is detailed in red in Figure 1.



Figure 1. Site Location

2.3 Commercial Setting

The site adjacent was a former restaurant (Cote) however, this is now closed and the site is vacant.

2.4 Existing Floor Plans

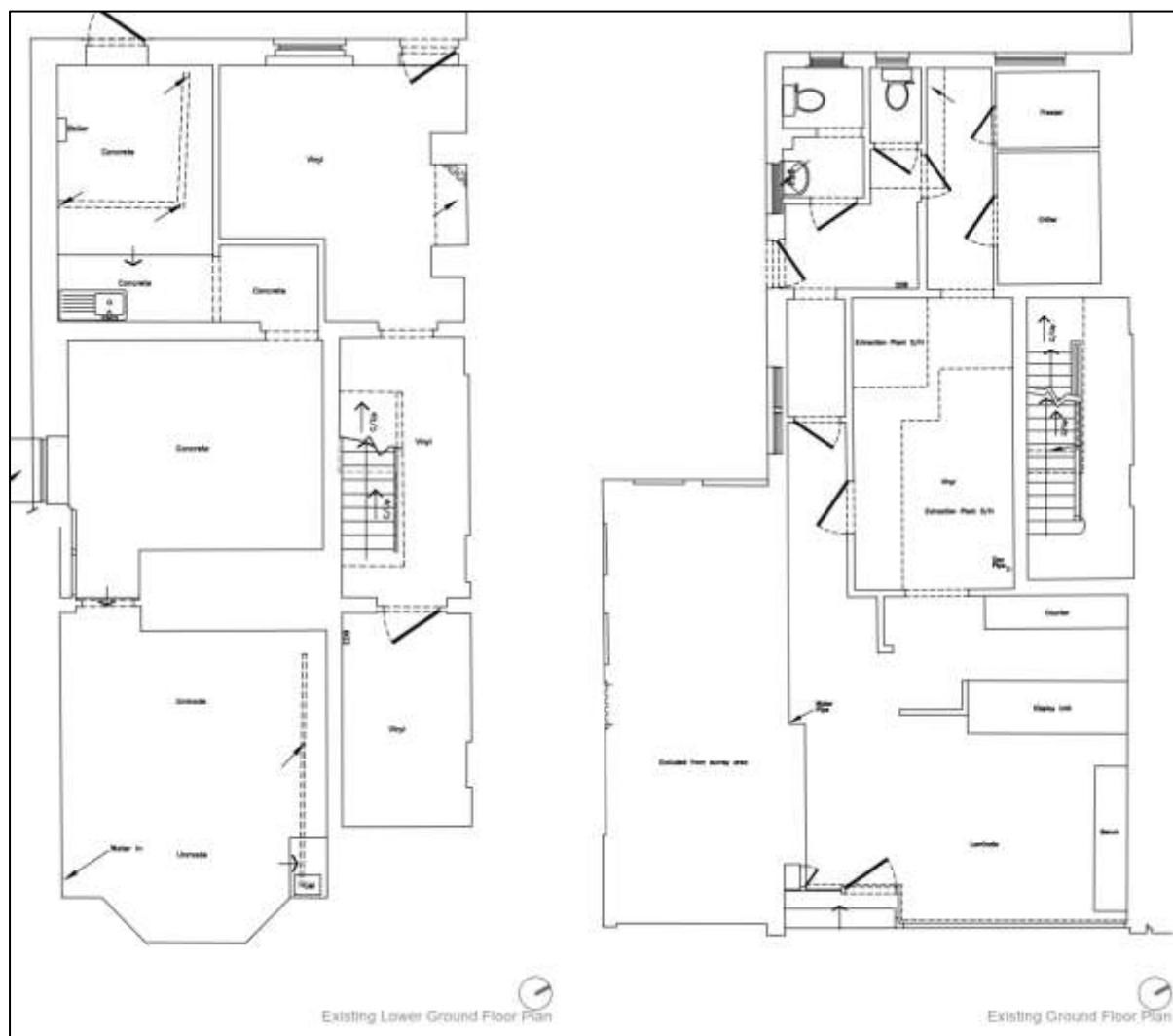


Figure 2. Existing Lower Ground Floor and Ground Floor

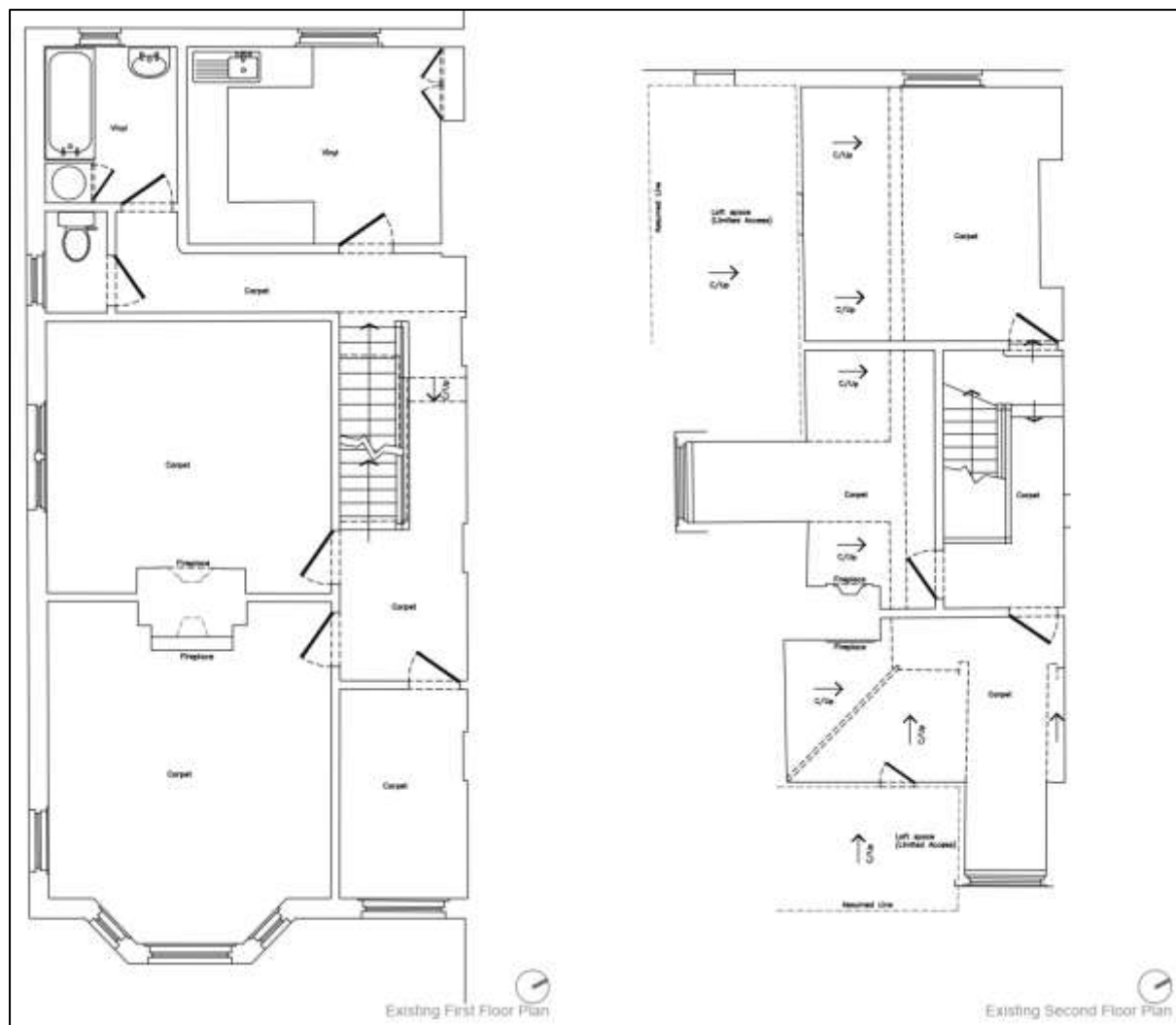


Figure 3. Existing First and Second Floors

2.5 Proposed Floor Plans



Figure 4. Proposed Lower Ground Floor and Ground Floors



Figure 5. Proposed First and Second Floors



Figure 6. Render of Rear of Premises

2.6 Discussion of Plans

An extension is noted to the rear of the premises which extends to the lower basement and the ground floor only.

At the lower ground and ground floor, there is noted to be a commercial demise. Whilst labelled as storage at lower ground floor, this is separated with a party wall with the studio flat. There will therefore be a requirement for an enhanced wall to protect the residential demise from commercial uses.

For the ground floor commercial space, there is no shared party wall separation. The 1B2P (55m² flat) and more specifically Bedroom 1 is separated via toilets and a stairwell.

At the first and second floors, these see Kitchen/Living/Diners located on the noisier Broadway façade and bedrooms set back and located on the quieter rear façade.

The ground floor commercial space will also share a party ceiling/floor with the first floor and require an enhanced separation to protect residential demises at the first floor.

2.7 Precedent for Residential Developments/Extension to the Rear

A number of developments on the Broadway area have received planning consent for either refurbishment or new build properties to the rear of the site. These include the following :

DM/22/1462 – 43 The Broadway –

DM/22/1462

Change of use from a A3/A5 to offices on the ground floor and C3 (residential) on upper floors to allow for 4 1-bed flats: four-storey extension in place of the redundant single-storey building to the rear and over the existing three-storey front building, together with associated internal and external alterations. (Amended Plans and description 21.09.2022)

43 The Broadway Haywards Heath West Sussex RH16 3AS

DM25/0196 – 45 The Broadway

DM/25/0196

Demolition of existing redundant single storey buildings to the rear. Erection of a four-storey rear extension and re-configuration work to convert existing commercial use to Use Class E a-c, e and g and 4 No. residential flats together with associated refuse and cycle storage. (Amended plans received 16.10.2025 to remove off street parking and create refuse collect point)

Thai Crystal 45 The Broadway Haywards Heath West Sussex RH16 3AS

Therefore, there is no reason for the current application to be refused on noise grounds.

2.8 Soundscape

2.8.1 Front

The soundscape at the front of the site was dominated by passing road traffic including buses.

2.8.2 Rear

The soundscape to the rear included construction noise, but train passes were also evident. In a 5-minute period, three train passes were noted

3 Relevant Policies and Standards

3.1 National Planning Policy Framework (NPPF-2024)

The National Planning Policy Framework (Dec 2024) defines the Government's planning policies for England and how these are expected to be applied. It sets out the Government's requirements for the planning system only to the extent that it is relevant, proportionate and necessary to do so.

The following paragraphs are relevant within NPPF Section 15 (Conserving and enhancing the natural environment) states the following:

Paragraph 187(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, and

Paragraph 198 - 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 impact 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; and

Paragraph 200– Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

3.2 BS8233:2014 Noise Criteria

Table 4 of BS8233:2014 provides the following guideline values:

Activity	Location	Time period of day	
		07:00-23:00	23:00-07:00
Resting	Living Rooms	35dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hour}$	30dB $L_{Aeq,8hour}$

Table 1. BS8233:2014 Criteria

It is relevant to note that Table 4 criteria in BS8233:2014 relates to continuous and anonymous sound. Based on the soundscapes observed, this is appropriate for the application site.

3.3 ProPG2017 - Professional Practice Guidance on Planning & Noise

Planning guidance (ProPG2017) relates to new residential development and airborne transportation noise, which includes exposure to road traffic, railway and aviation noise. Whilst ProPG, 2017 generally mirrors the requirements of BS8233:2014 and the World Health Organisation Guidelines, 1999, it goes further in setting a limit for inside bedrooms for L_{Amax} events and specifically, no more than 10 L_{Amax} events per night time period above 45dB(A).

The internal bedroom L_{Amax} values will be used in accordance with ProPG2017.

3.4 Planning Noise Advice Document Sussex November 2024

A planning noise advice document which all Sussex local authorities have contributed to and signed up to (including Mid Sussex District Council) remains relevant. The guidance document has been followed in respect of measurement parameters and report presentation of data.

3.5 Building Regulations – Approved Document E – Resistance to the Passage of Sound

It is noted that at ground floor, there remains a commercial space. It will therefore be relevant to ensure that there remains suitable soundproofing in place in respect of vertical transmission to both lower ground floor as well as first floor residential spaces. A party wall does not exist between the ground floor spaces, as seen in Figure 4 above.

It was not possible/practicable to test the spaces at the time of the visit to the site, as the floors has been exposed and the site stripped out.

3.6 Building Regulations – Approved Document O – Overheating

Recently introduced Part O of the building regulation requires an assessment of whether bedroom windows can be opened at night. It is assumed that bedroom windows will be closed if either of the conditions below are met:

- Internal noise level exceeds 40dB $L_{Aeq, 8hour}$
- L_{Amax} events exceed 55dB L_{Amax} more than 10 times a night.

Whilst this is strictly a Building Regulations function, it is relevant to be able to convey to the client whether bedroom windows are likely to be openable during the night time period.

4 Methodology

The following methodology was undertaken:

1. Attend site and place representative sound level meters at the front and rear of the premises.
2. Download and collate the data into daytime and night time sound pressure levels.
3. Identify the proposed changes and how the site soundscape is likely to impact these and specifically, the mitigation measures required to protect future occupants
4. Carry out rigorous calculations and conclude with suitable recommendations for the glazing and/or ventilation requirements.

5 Sound Survey(s)

Two class 1 sound level meters were used to characterise the site soundscape to the front and rear of the application site. These were both calibrated at 114dB at 1000Hz at the start and completion of the monitoring without any significant drift occurring.

Measurements were set to A weighting and Fast time resolution. The rear sound level meter was set to a 1minute resolution and the front sound level meter set to a 5minute resolution, the latter due to limited memory capacity.

Survey(s) carried out by	Scott Castle BSc(Hons) Env Health, MCIEH CEnvH MIOA
Equipment Used	Svantek 971A Class 1 Sound Level Meter (Rear) Norsonic 118, Class 1 Sound Level Meter
Equipment Used	Norsonic (1251) Acoustic Calibrator (114dB at 1000Hz) – Serial No.31699
Location	LT1 (Front) - Poetic.salon.loaning (WhatThreeWords). Monpod,1m from façade, approx. 5.4m above ground level. LT2 (Rear) - Dwelled.deflated.gobbles (WhatThreeWords) (monopod attached to fenceline. ST1 – swims.january.playback. 7.2m above ground level.
Duration	12 November 2025 to 17 November 2025

Table 2. Survey Details

An attended reading (ST1) was also made in façade condition at the rear of the first floor in order to understand the difference between LT2 and the rear of the building, in order that adjustments can be made for future calculations. This was ST1

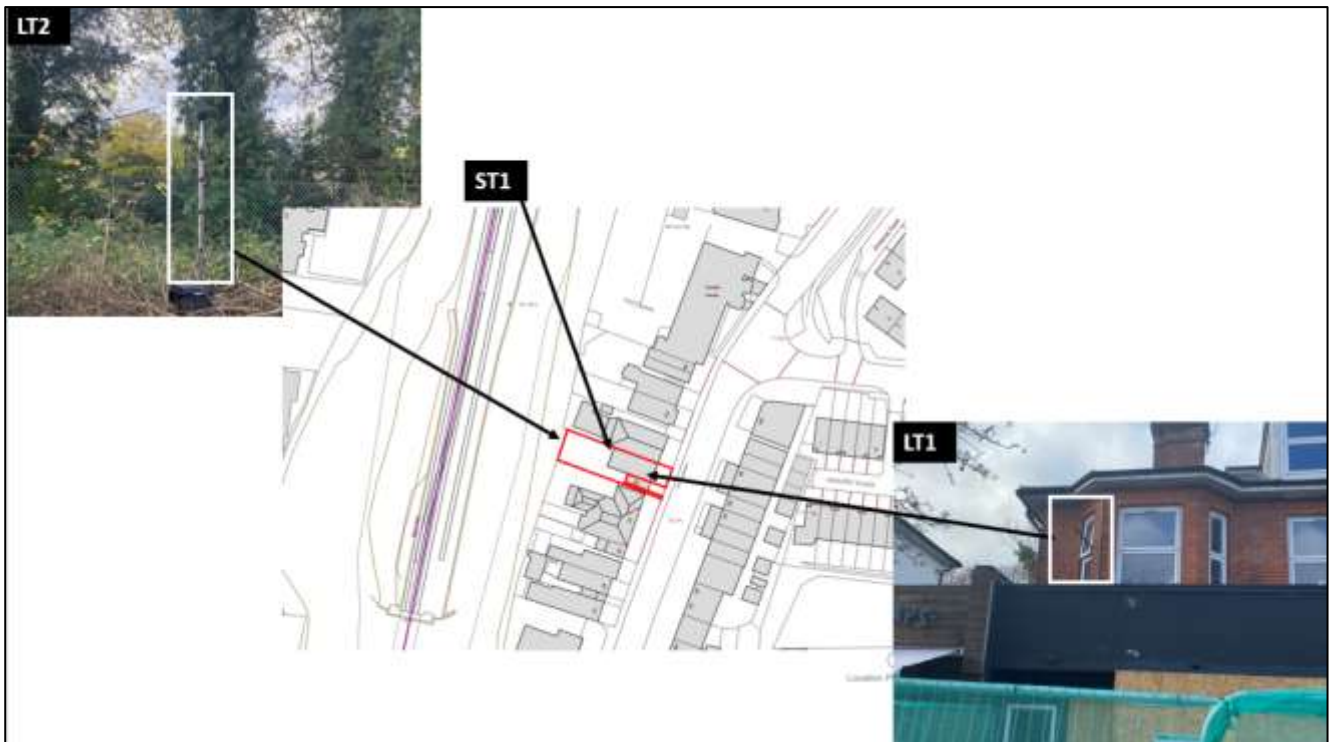


Figure 7. Images of Survey Location(s) Front and Rear

6 Results of the Sound Survey

The results are presented in freefield conditions.

6.1 Front Elevation (The Broadway)

The L_{Amax} data has not been presented, as there are only living rooms at the front façade.

Front of Premises - Broadway			
Logarithmically Averaged Day and Night time Periods (External - Freefield)-dB(A)			
$L_{Aeq, 16 \text{ hour- } 07:00-23:00}$		$L_{Aeq, 8 \text{ hour } 23:00-07:00}$	
Day 1	61.2	Night 1	54.9
Day 2	62.7	Night 2	57.1
Day 3	60.9	Night 3	59.4
Arithmetic Average	61.6	Arithmetic Average	57.1

Figure 8. Front Facade -The Broadway (Albeit in Freefield Conditions)

6.2 Rear Elevation (Freefield)

This is the measured data from the rear chainlink fence.

Rear Boundary									
Day	Date	L _{Aeq} 16/8Hr		11th L _{max}		Sound Reduction			
		Day	Night	1 min	2min	Day 16Hr	Night 8 Hr	L _{Amax,1min}	L _{Amax,2min}
Wed	12/11		47.5	67.2	67.04		17	22	22
Thu	13/11	54.0	48.8	68.16	66.76	19	19	23	22
Fri	14/11	54.1	48.3	67.32	67.03	19	18	22	22
Sat	15/11	53.3	47.5	67.52	66.63	18	18	23	22
Sun	16/11	51.5	47.1	66.04	66.04	16	17	21	21
Mon	17/11	54.9	48.5	67.46	67.46	20	19	22	22.46
AVERAGE:		54	48	67	67	19	18	22	22

Figure 9. LT2 Data (Freefield)

6.3 Attended Measurement

A 5-minute attended measurement was made at the first-floor rear façade by protruding a sound level meter out of the window.

The rationale for an attended rear measurement is that where bedrooms are located at first or second floors to the rear of the existing building, the difference in the site soundscape may be derived.

The sound level meter used was time aligned with the sound level meter at the rear of the premises in order that a direct comparison of the two values could be considered. In the 5-minute period, there were three train passes, albeit these were not visible, even from the first floor.

At the rear façade of the property, the freefield sound pressure level was 57.2dB L_{Aeq,5minutes}.

At the rear boundary (chain link fence and network rail boundary), the freefield sound pressure level was 58.5dB L_{Aeq,5minutes}. This produces only a 1.3dB difference.

7 Discussion

7.1 Calculation of the Sound Reduction Index (SRI)

There are three drivers which impact the façade sound reduction index or SRI. These are the daytime continuous noise levels measured over 16 hours in $L_{Aeq,T}$, the night time continuous noise levels over 8 hours, also measured in $L_{Aeq,T}$. Thirdly, ProPG2017 requires a consideration of the number of L_{Amax} events which will occur in a bedroom during the night time period. Specifically, ProPG2017 requires no more than ten events exceeding 45dB L_{Amax} measured internally. Whichever of these drivers is highest is applied to ensure that the residents are protected from each criterion.

An assessment has been made below of all rooms at all levels.

It is relevant to note that living room and bedroom calculations differ, as whilst living rooms are subject to only the daytime predicted sound pressure levels, bedrooms must consider both daytime and night time continuous sound pressure levels as well as L_{Amax} events during the night to protect sleep.

The daytime SRI is the predicted external freefield sound pressure level minus 35dB as per the Table 4 values in BS8233:2014 and the same for the night time values (albeit minus 30dB).

The L_{Amax} SRI is achieved by using the predicted night time external sound pressure level and comparing this with the measured night time survey noise level. The SRI figure is then adjusted to ensure no more than 10 L_{Amax} events per night inside the bedroom environment above 45dB L_{Amax} . The adjustment process takes account of each of the 5 measured night time periods to ensure that no individual night exceeds 10 events of 45dB L_{Amax} inside the bedroom.

The long-term survey positions (LT1 and LT2) have been used to assess night time data and L_{Amax} considerations. The SRI considerations have been split into bedrooms and living rooms for each façade and the data has been split into houses and flats accordingly.

7.1.1 Kitchen Living Diners (KLD)

Kitchen/Living/Diners				
Flat Number	Floor	Room Type	External SPL	SRI Required
1	Lower Ground	KLD	54	19
3	Ground	KLD	54	54
4	First	KLD	62	27
5	Second	KLD	62	27

Figure 10. Sound Reduction Index of Kitchen Living Diners

7.1.2 Bedrooms

Bedroom SRI								
Flat Number	Floor	Room Type	Daytime SPL	Night Time SPL	SRI Day	SRI Night	SRI Night L_{Amax}	SRI to Apply
1	Lower Ground	Bedrooms 1 and 2	54	48	19	18	23	23
2	Lower Ground	Studio	54	48	19	18	23	23
3	Ground	Bedroom 1	54	48	19	18	23	23
4	First	Bedroom 1 and 2	53	47	18	17	22	22
5	First	Bedroom 1 and 2	53	47	18	17	22	22

Figure 11. Sound Reduction Index of Bedrooms

7.2 Assessment of External Amenity Spaces

There are two terraces situated to the rear of the building. These are located at the ground floor of Flat 3 and the first floor of Flat 4. The Juliet terrace to Flat 5 has not been considered/assessed. These locations are shown in Figure 12 below.

For the ground floor, the terrace is noted to be circa 2.8m from the survey position. Using inverse square law and a 10 log relationship due to the line source, then a 0.4dB reduction could be applied to the survey daytime position. ($10\log(32.8/30)$). This would result in a 53.6dB at the terrace location.

For the first floor, the 1.3dB distance attenuation noted by the attended short term data can be applied and this would result in a 1.5dB subtraction from 54dB for the daytime $L_{Aeq,16\text{ hours}}$. Therefore, the flat 4 terrace would be approximately 52.7dB.

Both terraces are below the 55dB $L_{Aeq,16\text{ hour}}$ upper limit described in BS8233:2014, ProPG2017 and the World Health Organisation Guidelines for Community Noise dated 1999/revised 2018.



Figure 12. Rear Terrace Locations

7.3 ProPG2017 Initial Site Risk Assessment

To ensure transparency, an initial site risk assessment, consistent with the approach in ProPG2017 has been carried out in Figure 13 below. This shows the site as having a low to medium risk. For the front of the site overlooking The Broadway, this is low to medium, whereas the new build extension to the rear is a low risk.

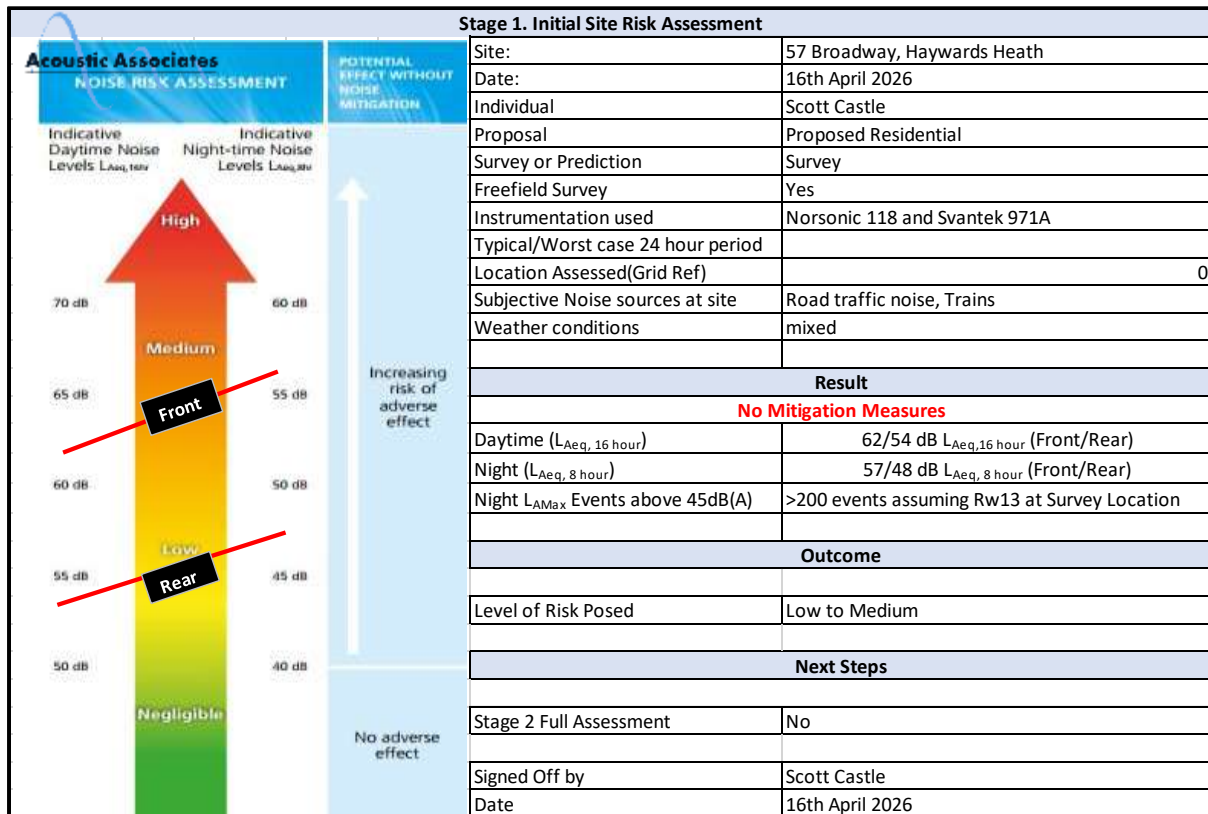


Figure 13. ProPG2017 Initial Site Risk Assessment

7.4 Simplified Overheating Assessment

Recently introduced Part O of the building regulation requires an assessment of whether bedroom windows can be opened at night. It is assumed that bedroom windows will be closed if either of the conditions below are met:

- Internal noise level exceeds 40dB $L_{Aeq, 8\text{ hour}}$
- L_{Amax} events exceed 55dB L_{Amax} more than 10 times a night.

Whilst this is strictly a Building Regulations function, it is relevant to be able to convey to the client whether bedroom windows are likely to be openable during the night time period.

Bedrooms at the site are located to the middle of the site and the rear of the original building. The night time soundscape is below 50dB $L_{Aeq, 8\text{ hour}}$ allowing a simplified assessment to be carried out.

As stated above, the assessment is in two parts, both of which must be achieved to determine if windows are openable during the night time period.

7.4.1 40dB $L_{Aeq, 8\text{ hour}}$

With a freefield external sound pressure level of 47dB (rounded), an open window (10dB subtraction) would provide for 37dB $L_{Aeq, 8\text{ hour}}$ internally.

7.4.2 L_{Amax} Events

With a 10dB open window, there would be an average of 12 events per night. This exceeds the 10 permissible events of 55dB L_{Amax} .

7.4.3 Simplified Overheating Assessment – Outcome

Bedroom windows would not likely be openable for the night time period to mitigate thermal overheating and the client will need to further consider this in due course.

7.4.4 Overheating – Equivalent Area (Window Opening)

Where a simplified assessment is not capable of being carried out, it is possible to calculate an equivalent openable area for the window (see note below). This has been calculated as per the ANC 2024 guidance for overheating.

Equivalent Area Calculation - Open Window Assessment					
Floor	Flat Number	Room Descriptor	Room Volume	SRI Required	Equivalent Opening Area
Lower Ground	1	Bedrooms 1 and 2	28.8	8	0.7
Lower Ground	2	Studio	88.8	8	2.2
Ground	3	Bedroom 1	33.6	8	0.8
First Floor	4	Bedroom 1	33.6	7	1.1
First Floor	4	Bedroom 2	28.8	7	0.9
Second Floor	5	Bedroom 1	33.6	7	1.1
Second Floor	5	Bedroom 2	28.8	7	0.9

Figure 14. Window Opening - Equivalent Areas

It should be recognised that a standard through frame small slot trickle vent is approximately 2500mm². This equates to 0.0025m². Therefore, an openable window in Figure 14 above of any less than this would not be practical.

Figure 14 above shows in the final column the maximum permissible equivalent openable area for the bedroom windows of Flats 1-5 to achieve compliance with the internal L_{Aeq,8hr} noise criteria. As can be seen, this is achieved.

The data should be shared with your M+E/overheating consultant. Overheating assessments are not carried out for ground floor windows as these are not openable during the night time period on safety or security grounds.

This report is not a formal/dynamic overheating risk assessment.

7.5 Rigorous Calculations

For Flats 4 and 5, ie first and second floors, these are an existing masonry build and have been considered as such for their rigorous calculations.

For Flats 1 to 3, these are new build and have been modelled using a timber framed wall, based on a build-up provided by the client's architects. Whilst for brevity the outcomes of the rigorous calculations are detailed below, the full calculations are shown in Appendix A. Appendix B contains the proposed wall build up (timber frame) for the new build.

Outcomes of Rigorous Calculations								
Plot	Floor	Rooms	External SPL	SRI Required	Window	Vent	Internal SPL	SRI Achieved
Flat 1	Lower Ground	KLD	54	19	4\12\4	Simon Acoustic SL	28.5	25.5
Flat 1	Lower Ground	Bedroom 2	54	23	4\12\4	Simon Acoustic SL	30	24
Flat 1	Lower Ground	Bedroom 1	54	23	4\12\4	Simon Acoustic SL	30	24
Flat 2	Lower Ground	Studio	54	23	4\12\4	Simon Acoustic SL	27	27
Flat 3	Ground	KLD	54	19	4\12\4	Simon Acoustic SL	27	27
Flat 3	Ground	Bedroom 1	54	23	4\12\4	Simon Acoustic SL	29	25
Flat 4	First	KLD	62	27	10\12\6	2x Greenwood EA 5000	35	27
Flat 4	First	KLD	62	27	10\12\4	Ryton 9x9 Airliner	34	29
Flat 4	First	Bedroom 1	53	22	4\12\4	2x Greenwood EA 5000	27	26
Flat 4	First	Bedroom 2	53	22	4\12\4	2x Greenwood EA 5000	25	28
Flat 5	Second	KLD	62	27	10\12\6.4	2x Greenwood EA 5000	35	27
Flat 5	Second	KLD	62	27	10\12\6	Ryton 9x9 Airliner	33	29
Flat 5	Second	Bedroom 1	53	22	4\12\4	2x Greenwood EA 5000	28	25
Flat 5	Second	Bedroom 1	53	22	4\12\4	Ryttons AAC125HP LookRyt	25	28
Flat 5	Second	Bedroom 2	53	22	4\12\4	2x Greenwood EA 5000	26	27
Flat 5	Second	Bedroom 2	53	22	4\12\4	Ryttons AAC125HP LookRyt	22	32

Figure 15. Outcomes of Rigorous Calculations

The rationale for the higher specification glazing for the second floor living room overlooking The Broadway is that the sound was assessed as also passing through the roof component.

For flats 4 and 5 with the higher noise profiles at the front of the site overlooking the Broadway, two window and ventilation choices have been presented which include through frame trickle vents as well as through wall passive vents.

For Flat 3, the ground floor extension, this has been assessed with a flat roof with a timber joist, asphalt on boarding and 12mm plasterboard ceiling and thermal insulation. It is however understood that this may well be a green roof and of a higher specification.

Whilst the development has been assessed using passive (through frame or through wall) attenuators, the client may opt for mechanical ventilation in due course.

7.6 Separation of Commercial and Residential Demises

In section 2.6, reference was made to having a commercial and residential split. This occurs at the following locations:

Lower Ground Floor – Flat 2 (Studio) and Commercial Storage – Horizontal Divide.

Ground Floor Commercial, vertical separation between ground floor and Flat 4 above.

The proposed options for separation are detailed below.

7.6.1 Basement – Option 1

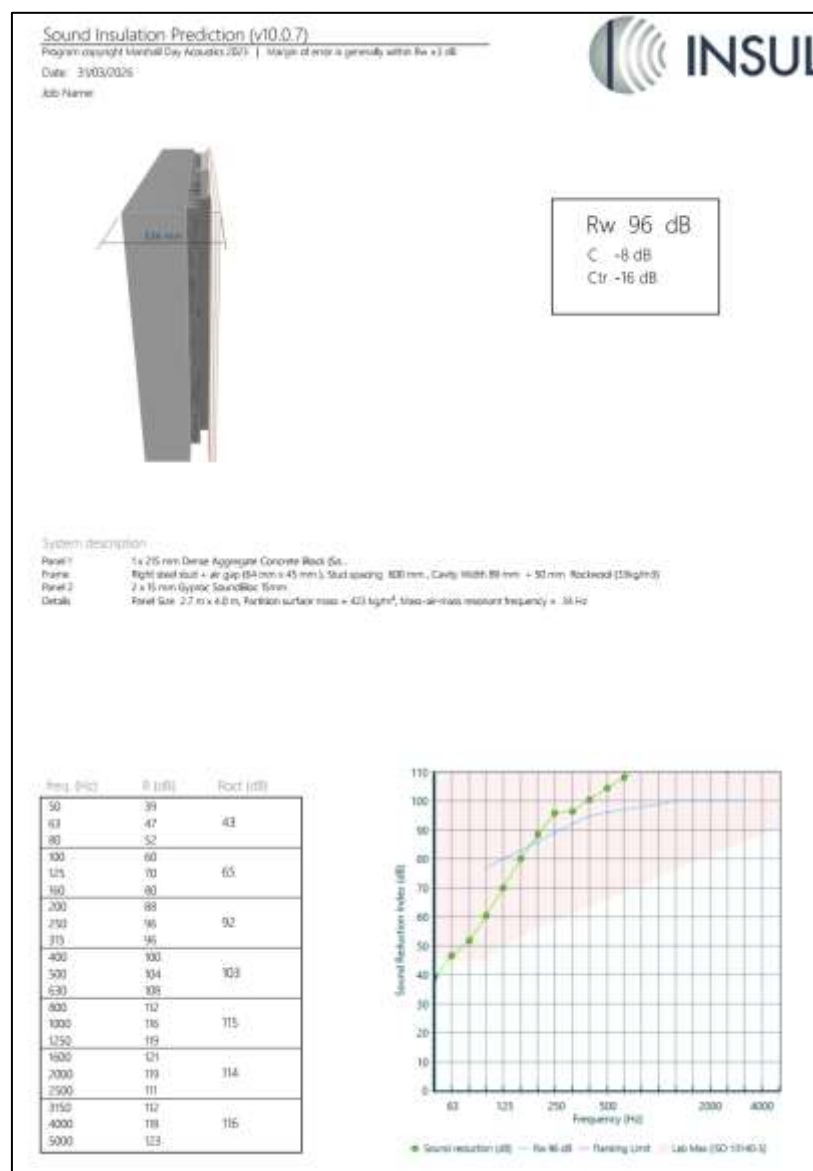


Figure 16. Basement Wall - Option 1

7.6.2 Basement – Option 2

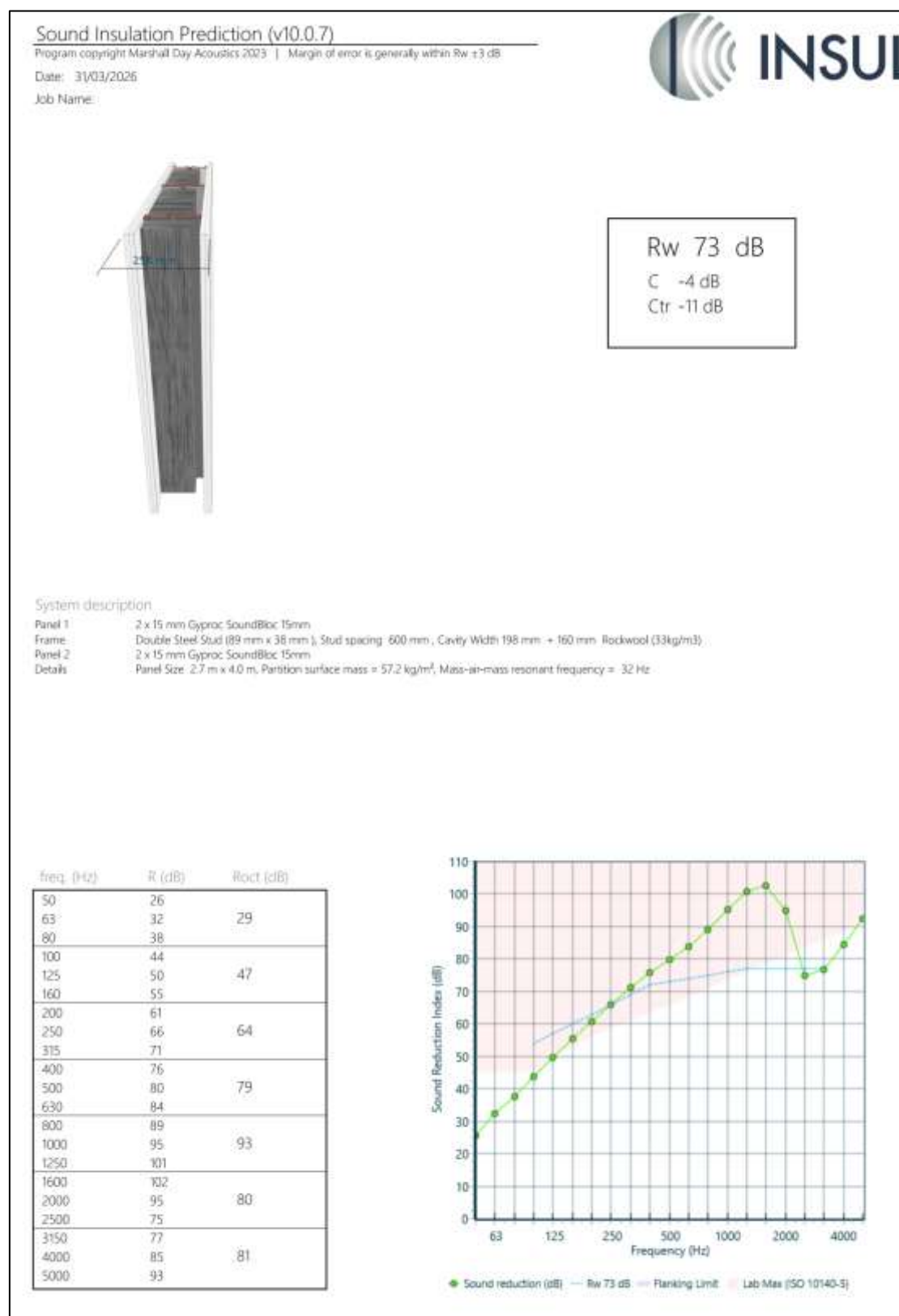


Figure 17. Basement Wall- Option 2

7.6.3 Ground Floor to First Floor (Flat 4) Separation – Option 1

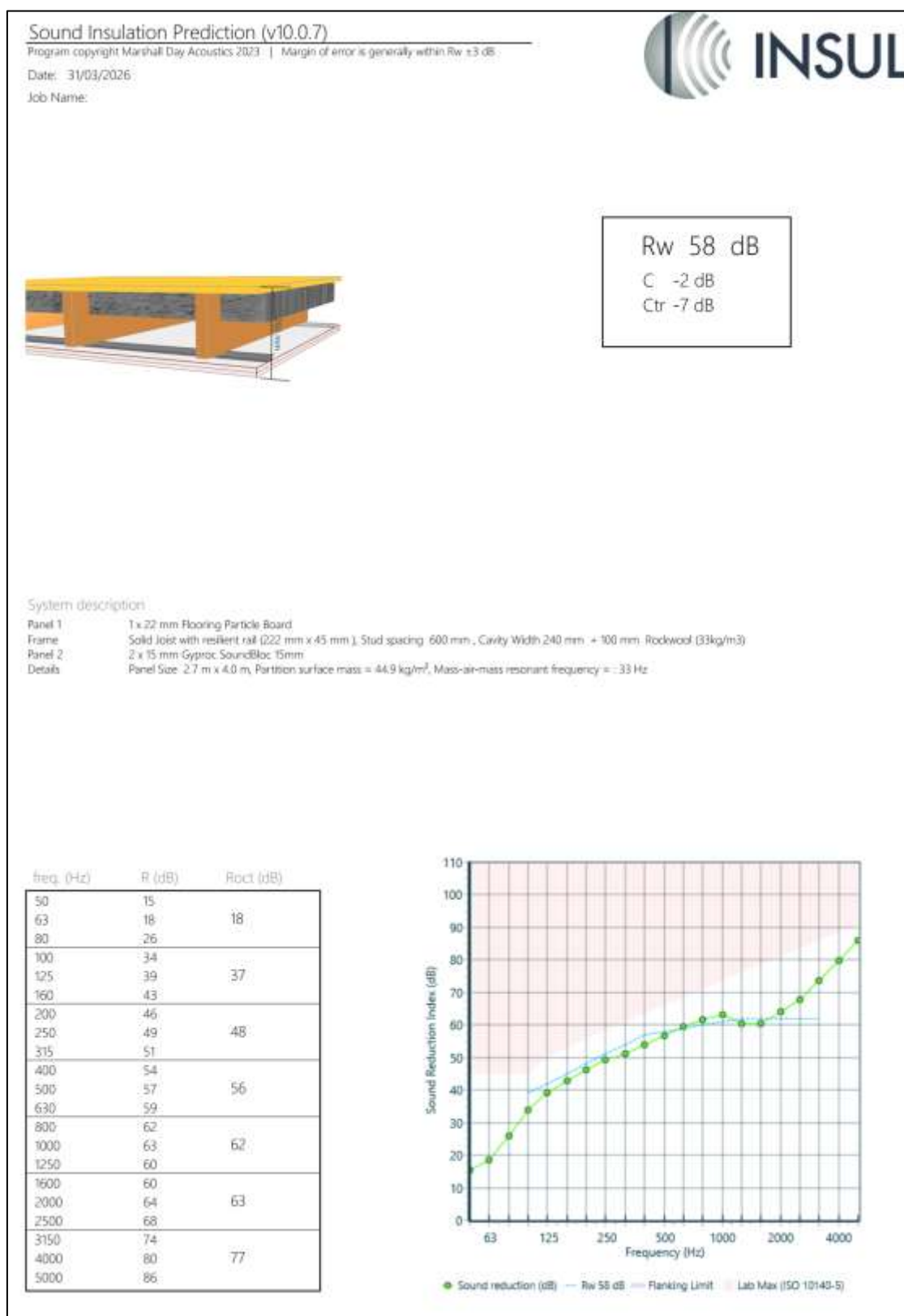


Figure 18. Party Ceiling/Floor- Ground to First-Option 1

7.6.4 Ground Floor to First Floor (Flat 4) Separation – Option 2

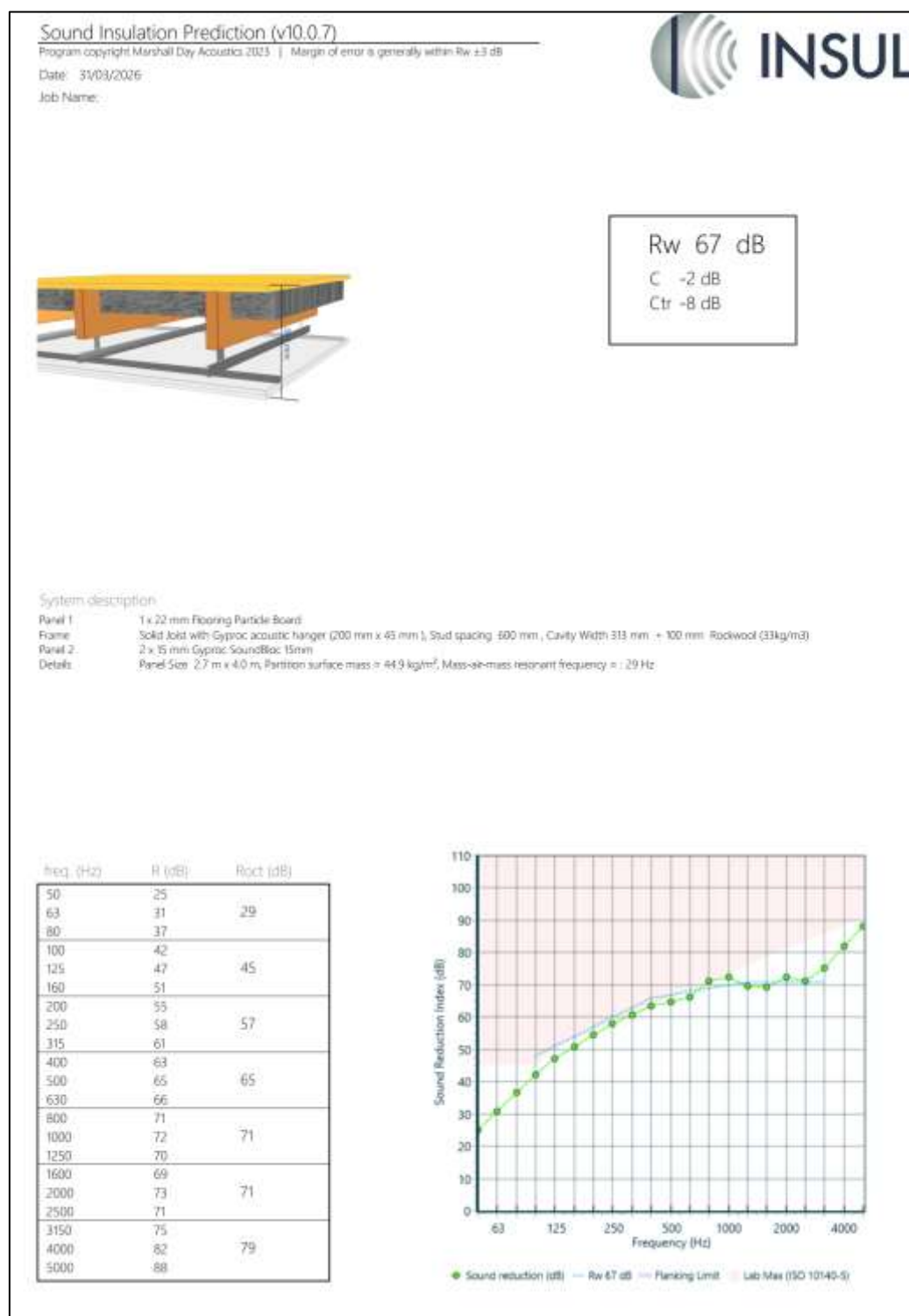


Figure 19. Party Ceiling/Floor- Ground to First- Option 2

7.6.5 Commercial/Residential Separation

All of the 4 options above will comfortably achieve sound insulation performance above Building regulations Approved Document E. It is noted that the local planning authority are capable of achieving this with a suitably worded condition and this remains consistent with the approach in the Planning Noise Advice Document Sussex dated November 2023.

It is advised that the client contact Acoustic South East with the completed design specification in order that any finalised design may take account of potential flanking sound issues which may reduce the performance of the above details.

8 Recommendations

8.1 Glazing

A variety of glazing has been provided to ensure that residents remain protected from adverse external noise levels. Whilst Pilkington Glass has been used within the calculations, should alternative glazing providers be sought, then the only metric for relevant comparison is that of R_{traffic} or sometimes referred to as $R_w + C_{tr}$ which includes a low frequency correction.

Sound Insulation Performance of Window Units			
Brand	Window Specification	R_w	R_{traffic}
Pilkington Double	4\12\4	31	25
Pilkington Double	10\12\4	36	29
Pilkington Double	10\12\6	38	32
Pilkington Double	10\12\6.4	40	34

Figure 20. R_{traffic} Glazing Solutions

N.B. This is the required $R_w + C_{tr}$ of the frame and glazing together. If the glazing supplier has test results for the glass on its own an $R_w + C_{tr}$ value 2-3dB higher would be required (glazing tested on its own will outperform glazing that is tested within a window frame). Please note $R_w + C_{tr}$ is also referred to as R_{traffic}

8.2 Ventilation

The ventilation proposed has used passive through frame and through wall vents.

For the through frame vents, these have used two Greenwood EA5000mm² vents

For the passive through wall vents, these have used Rytons products and specifically the AAC125HP Look Ryt for bedrooms with an EA of 8500mm² and for Kitchens/Living and Dining Rooms a Rytons 9x9 airliner with 12800mm² EA.

8.3 Separation between Commercial and Residential Spaces

Whilst the client recognises the requirement to enhance the soundproofing between the commercial and residential demises, various solutions have been offered which will exceed the requirements of Building Regulations Approved Document E. It is anticipated that the local planning authority will likely apply a condition requiring that there remains adequate soundproofing to protect future residential occupants.

9 Conclusion

The site soundscape was measured using two class 1 unattended sound level meters between 12-17th November 2025. These were placed at the front and rear of the premises and additional attended measurements were undertaken to understand how the site soundscape differs. The noisier façade is that of the Broadway which is dominated by road traffic noise. Railway noise is noted to the rear. The survey data obtained was consistent with other Acoustic South East measurements made in the immediate area.

Contextually, there is already residential accommodation at first and second floors of 57 The Broadway. These remain, as does the lower ground floor and ground floor proposed commercial uses.

It is also noted that there have been recent planning approvals for residential developments at the site which demonstrate a precedent for additional residential development in the immediate area, albeit, placed onto the quieter façade closer to the railway line. The new build lower ground and ground floors are protected from the noisier façade by the massing of the existing building and experience a relatively low site soundscape for the daytime and night time periods.

Good acoustic design has been taken into account to ensure that the placement of sensitive living spaces such as bedrooms are located at quieter facades.

A ProPG2017 initial site risk assessment identified the site as low to medium risk.

Proposed external amenity areas located at the rear facade have also been assessed and are below the upper limits contained within BS8233:2014 and ProPG2017 (ie 55dB $L_{Aeq,16\text{ hour}}$).

The client has also acknowledged the requirement for an enhanced separation between commercial and residential spaces and proposed solutions to ensure that future occupants remain protected from adverse noise levels.

Based on the information above, planning permission should not be withheld on noise grounds.

10 Appendix A – Rigorous Calculations

Non Frequency Dependent Variables			Key for Table Below					
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)				
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)				
S _f	Total Facade Area (m^2)	25.8	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)				
S _{wi}	Window Area (m^2)	7.74	A	Equivalent Absorption Area of Rx Room				
S _{ew}	External Wall Area (m^2)	18.06	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)				
S _{rr}	Ceiling Area (m^2)	0.00001						
S	Total Area sound enters the room (m^2)	25.80001						
Frequency Dependent Variables								
Term	Description	Octave Band Centre Frequency						
		125	250	500	1000	2000	4000	
Leq,ff	Free-Field External Noise Level	64	60	58	58	55	48	
D _{n,e}	Ryton 9x9 Airliner (38dB Open)	36	29	31	39	44	52	
R _{wi}	10_12_4	25	22	33	40	43	44	
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65	
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43	
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00	
BS8233 Calculation Details								
Term From Equation Below		Octave Band Centre Frequency						
		125	250	500	1000	2000	4000	
Leq,ff		64	60	58	58	55	48	
A _o /S . 10^(-D _{n,e} /10)		9.74E-05	0.000488	0.000308	4.88E-05	1.54E-05	2.45E-06	
S _{wi} /S . 10^(-R _{wi} /10)		0.000949	0.001893	0.00015	3E-05	1.5E-05	1.19E-05	
S _{ew} /S . 10^(-R _{ew} /10)		5.56E-05	8.81E-05	2.79E-05	4.42E-06	7E-07	2.21E-07	
S _{rr} /S . 10^(-R _{rr} /10)		6.14E-10	1.54E-10	1.94E-11	1.94E-11	1.94E-11	1.94E-11	
10log10(S/A)+3		6.702272	5.654918	5.074999	5.074999	5.355286	5.355286	
Leq,2		41.12269	39.58004	29.94228	22.27687	15.29212	5.001836	
A-Weighting		-16.1	-8.6	-3.2	0	1.2	1	
A-Weighted Leq		25.02269	30.98004	26.74228	22.27687	16.49212	6.001836	
A-Weighted Level Outside		62						
BS8233 Predicted Internal A-Weighted Level		34						
Predicted Building Envelope SRI		29						
BS8233 Calculation can be seen below:								
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$								

Non Frequency Dependent Variables			Key for Table Below				
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)			
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)			
S _f	Total Facade Area (m^2)	25.8	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)			
S _{wi}	Window Area (m^2)	7.74	A	Equivalent Absorption Area of Rx Room			
S _{ew}	External Wall Area (m^2)	18.06	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)			
S _{rr}	Ceiling Area (m^2)	0.00001					
S	Total Area sound enters the room (m^2)	25.80001					

Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	64	60	58	58	55	48
D _{n,e}	2x Greenwood 5000	36.5	34.3	32.5	29	28	30.5
R _{wi}	10_12_6	26	27	34	40	38	46
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00

BS8233 Calculation Details							
Term From Equation Below	Octave Band Centre Frequency						
	125	250	500	1000	2000	4000	
Leq,ff	64	60	58	58	55	48	
A _o /S . 10^(-D _{n,e} /10)	8.68E-05	0.000144	0.000218	0.000488	0.000614	0.000345	
S _{wi} /S . 10^(-R _{wi} /10)	0.000754	0.000599	0.000119	3E-05	4.75E-05	7.54E-06	
S _{ew} /S . 10^(-R _{ew} /10)	5.56E-05	8.81E-05	2.79E-05	4.42E-06	7E-07	2.21E-07	
S _{rr} /S . 10^(-R _{rr} /10)	6.14E-10	1.54E-10	1.94E-11	1.94E-11	1.94E-11	1.94E-11	
10log10(S/A)+3	6.702272	5.654918	5.074999	5.074999	5.355286	5.355286	
Leq,2	40.22507	34.84941	28.70104	30.2548	28.56745	18.83553	
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1	
A-Weighted Leq	24.12507	26.24941	25.50104	30.2548	29.76745	19.83553	

A-Weighted Level Outside	62	Flat 4 KLD
BS8233 Predicted Internal A-Weighted Level	35	
Predicted Building Envelope SRI	27	

BS8233 Calculation can be seen below:	
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$	

Non Frequency Dependent Variables			Key for Table Below					
Term	Derivation	Value	R _{wi}	Sound Reduction of Table Window (Octave)				
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)				
S _f	Total Facade Area (m^2)	25.68	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)				
S _{wi}	Window Area (m^2)	5.48	A	Equivalent Absorption Area of Rx Room				
S _{ew}	External Wall Area (m^2)	20.2	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)				
S _{rr}	Ceiling Area (m^2)	22						
S	Total Area sound enters the room (m^2)	47.68						
Frequency Dependent Variables								
Term	Description	Octave Band Centre Frequency						
		125	250	500	1000	2000	4000	
Leq,ff	Free-Field External Noise Level	64	60	58	58	55	48	
D _{n,e}	2x Greenwood 5000	36.5	34.3	32.5	29	28	30.5	
R _{wi}	10_12_6.4	27	29	36	41	42	52	
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65	
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43	
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00	
BS8233 Calculation Details								
Term From Equation Below		Octave Band Centre Frequency						
		125	250	500	1000	2000	4000	
Leq,ff		64	60	58	58	55	48	
A _o /S . 10^(-D _{n,e} /10)		4.7E-05	7.79E-05	0.000118	0.000264	0.000332	0.000187	
S _{wi} /S . 10^(-R _{wi} /10)		0.000229	0.000145	2.89E-05	9.13E-06	7.25E-06	7.25E-07	
S _{ew} /S . 10^(-R _{ew} /10)		3.37E-05	5.33E-05	1.69E-05	2.67E-06	4.24E-07	1.34E-07	
S _{rr} /S . 10^(-R _{rr} /10)		0.000731	0.000184	2.31E-05	2.31E-05	2.31E-05	2.31E-05	
10log10(S/A)+3		9.369436	8.322082	7.742163	7.742163	8.02245	8.02245	
Leq,2		43.54482	34.94626	28.45598	30.49835	28.62394	19.26338	
A-Weighting		-16.1	-8.6	-3.2	0	1.2	1	
A-Weighted Leq		27.44482	26.34626	25.25598	30.49835	29.82394	20.26338	
A-Weighted Level Outside		62	Flat 5 KLD					
BS8233 Predicted Internal A-Weighted Level		35						
Predicted Building Envelope SRI		27						
BS8233 Calculation can be seen below:								
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$								

Non Frequency Dependent Variables			Key for Table Below					
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)				
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)				
S _f	Total Facade Area (m^2)	25.68	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)				
S _{wi}	Window Area (m^2)	5.48	A	Equivalent Absorption Area of Rx Room				
S _{ew}	External Wall Area (m^2)	20.2	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)				
S _{rr}	Ceiling Area (m^2)	22						
S	Total Area sound enters the room (m^2)	47.68						

Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	64	60	58	58	55	48
D _{n,e}	Ryton 9x9 Airliner (38dB Open)	36	29	31	39	44	52
R _{wi}	10_12_6.4	27	29	36	41	42	52
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00

BS8233 Calculation Details							
Term From Equation Below	Octave Band Centre Frequency						
	125	250	500	1000	2000	4000	
Leq,ff	64	60	58	58	55	48	
A _o /S . 10^(-D _{n,e} /10)	5.27E-05	0.000264	0.000167	2.64E-05	8.35E-06	1.32E-06	
S _{wi} /S . 10^(-R _{wi} /10)	0.000229	0.000145	2.89E-05	9.13E-06	7.25E-06	7.25E-07	
S _{ew} /S . 10^(-R _{ew} /10)	3.37E-05	5.33E-05	1.69E-05	2.67E-06	4.24E-07	1.34E-07	
S _{rr} /S . 10^(-R _{rr} /10)	0.000731	0.000184	2.31E-05	2.31E-05	2.31E-05	2.31E-05	
10log10(S/A)+3	9.369436	8.322082	7.742163	7.742163	8.02245	8.02245	
Leq,2	43.56866	36.42275	29.46128	23.61899	18.94979	10.05498	
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1	
A-Weighted Leq	27.46866	27.82275	26.26128	23.61899	20.14979	11.05498	

A-Weighted Level Outside	62	Flat 5 KLD
BS8233 Predicted Internal A-Weighted Level	33	
Predicted Building Envelope SRI	29	

BS8233 Calculation can be seen below:							
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$							

Non Frequency Dependent Variables			Key for Table Below				
Term	Derivation	Value	R _{wi}	Sound Reduction of Table Window (Octave)			
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)			
S _f	Total Facade Area (m^2)	25.68	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)			
S _{wi}	Window Area (m^2)	5.48	A	Equivalent Absorption Area of Rx Room			
S _{ew}	External Wall Area (m^2)	20.2	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)			
S _{rr}	Ceiling Area (m^2)	22					
S	Total Area sound enters the room (m^2)	47.68					
Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	64	60	58	58	55	48
D _{n,e}	Ryton 9x9 Airliner (38dB Open)	36	29	31	39	44	52
R _{wi}	10_12_6	26	27	34	40	38	46
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00
BS8233 Calculation Details							
Term From Equation Below		Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff		64	60	58	58	55	48
A _o /S . 10^(-D _{n,e} /10)		5.27E-05	0.000264	0.000167	2.64E-05	8.35E-06	1.32E-06
S _{wi} /S . 10^(-R _{wi} /10)		0.000289	0.000229	4.58E-05	1.15E-05	1.82E-05	2.89E-06
S _{ew} /S . 10^(-R _{ew} /10)		3.37E-05	5.33E-05	1.69E-05	2.67E-06	4.24E-07	1.34E-07
S _{rr} /S . 10^(-R _{rr} /10)		0.000731	0.000184	2.31E-05	2.31E-05	2.31E-05	2.31E-05
10log10(S/A)+3		9.369436	8.322082	7.742163	7.742163	8.02245	8.02245
Leq,2		43.80823	36.95759	29.76207	23.78323	20.02205	10.41096
A-Weighting		-16.1	-8.6	-3.2	0	1.2	1
A-Weighted Leq		27.70823	28.35759	26.56207	23.78323	21.22205	11.41096
A-Weighted Level Outside		62	Flat 5 KLD				
BS8233 Predicted Internal A-Weighted Level		33					
Predicted Building Envelope SRI		29					
BS8233 Calculation can be seen below:							
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$							

Non Frequency Dependent Variables			Key for Table Below				
Term	Derivation	Value	R _{wi}	Sound Reduction of Table Window (Octave)			
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)			
S _f	Total Facade Area (m^2)	21.12	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)			
S _{wi}	Window Area (m^2)	4.9	A	Equivalent Absorption Area of Rx Room			
S _{ew}	External Wall Area (m^2)	16.22	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)			
S _{rr}	Ceiling Area (m^2)	14					
S	Total Area sound enters the room (m^2)	35.12					
Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	55	51	49	49	46	39
D _{n,e}	2x Greenwood 5000	36.5	34.3	32.5	29	28	30.5
R _{wi}	4_12_4	24	20	25	35	38	35
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00
BS8233 Calculation Details							
Term From Equation Below		Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff		55	51	49	49	46	39
A _o /S . 10^(-D _{n,e} /10)		6.37E-05	0.000106	0.00016	0.000358	0.000451	0.000254
S _{wi} /S . 10^(-R _{wi} /10)		0.000555	0.001395	0.000441	4.41E-05	2.21E-05	4.41E-05
S _{ew} /S . 10^(-R _{ew} /10)		3.67E-05	5.81E-05	1.84E-05	2.91E-06	4.62E-07	1.46E-07
S _{rr} /S . 10^(-R _{rr} /10)		0.000632	0.000159	2E-05	2E-05	2E-05	2E-05
10log10(S/A)+3		8.041618	6.994265	6.414345	6.414345	6.694632	6.694632
Leq,2		34.13966	30.34411	23.47405	21.70311	19.63043	10.71916
A-Weighting		-16.1	-8.6	-3.2	0	1.2	1
A-Weighted Leq		18.03966	21.74411	20.27405	21.70311	20.83043	11.71916
A-Weighted Level Outside		53	Flat 5 Bedroom 1				
BS8233 Predicted Internal A-Weighted Level		28					
Predicted Building Envelope SRI		25					
BS8233 Calculation can be seen below:							
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$							

Non Frequency Dependent Variables			Key for Table Below				
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)			
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)			
S _f	Total Facade Area (m^2)	21.12	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)			
S _{wi}	Window Area (m^2)	4.9	A	Equivalent Absorption Area of Rx Room			
S _{ew}	External Wall Area (m^2)	16.22	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)			
S _{rr}	Ceiling Area (m^2)	14					
S	Total Area sound enters the room (m^2)	35.12					
Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	55	51	49	49	46	39
D _{n,e}	Rytens AAC125HP Look Ryt	42	37	34	43	57	64
R _{wi}	4_12_4	24	20	25	35	38	35
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00
BS8233 Calculation Details							
Term From Equation Below	Octave Band Centre Frequency						
	125	250	500	1000	2000	4000	
Leq,ff	55	51	49	49	46	39	
A _o /S . 10^(-D _{n,e} /10)	1.8E-05	5.68E-05	0.000113	1.43E-05	5.68E-07	1.13E-07	
S _{wi} /S . 10^(-R _{wi} /10)	0.000555	0.001395	0.000441	4.41E-05	2.21E-05	4.41E-05	
S _{ew} /S . 10^(-R _{ew} /10)	3.67E-05	5.81E-05	1.84E-05	2.91E-06	4.62E-07	1.46E-07	
S _{rr} /S . 10^(-R _{rr} /10)	0.000632	0.000159	2E-05	2E-05	2E-05	2E-05	
10log10(S/A)+3	8.041618	6.994265	6.414345	6.414345	6.694632	6.694632	
Leq,2	33.98244	30.21849	23.14436	14.51442	9.041586	3.780726	
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1	
A-Weighted Leq	17.88244	21.61849	19.94436	14.51442	10.24159	4.780726	
A-Weighted Level Outside		53	Flat 5 Bedroom 1				
BS8233 Predicted Internal A-Weighted Level		25					
Predicted Building Envelope SRI		28					
BS8233 Calculation can be seen below:							
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$							

Non Frequency Dependent Variables			Key for Table Below				
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)			
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)			
S _f	Total Facade Area (m^2)	8.88	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)			
S _{wi}	Window Area (m^2)	1.12	A	Equivalent Absorption Area of Rx Room			
S _{ew}	External Wall Area (m^2)	7.76	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)			
S _{rr}	Ceiling Area (m^2)	12					
S	Total Area sound enters the room (m^2)	20.88					
Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	55	51	49	49	46	39
D _{n,e}	2x Greenwood 5000	36.5	34.3	32.5	29	28	30.5
R _{wi}	4_12_4	24	20	25	35	38	35
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00
BS8233 Calculation Details							
Term From Equation Below		Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff		55	51	49	49	46	39
A _o /S . 10 [^] (-D _{n,e} /10)		0.000107	0.000178	0.000269	0.000603	0.000759	0.000427
S _{wi} /S . 10 [^] (-R _{wi} /10)		0.000214	0.000536	0.00017	1.7E-05	8.5E-06	1.7E-05
S _{ew} /S . 10 [^] (-R _{ew} /10)		2.95E-05	4.68E-05	1.48E-05	2.34E-06	3.72E-07	1.18E-07
S _{rr} /S . 10 [^] (-R _{rr} /10)		0.000911	0.000229	2.88E-05	2.88E-05	2.88E-05	2.88E-05
10log10(S/A)+3		5.783378	4.736025	4.156105	4.156105	4.436392	4.436392
Leq,2		31.79102	25.69203	19.99147	21.29221	19.44948	10.18251
A-Weighting		-16.1	-8.6	-3.2	0	1.2	1
A-Weighted Leq		15.69102	17.09203	16.79147	21.29221	20.64948	11.18251
A-Weighted Level Outside		53					
BS8233 Predicted Internal A-Weighted Level		26					
Predicted Building Envelope SRI		27					
BS8233 Calculation can be seen below:							
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$							

Non Frequency Dependent Variables			Key for Table Below				
Term	Derivation	Value	R _{wi}	Sound Reduction of Table Window (Octave)			
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Oct)			
S _f	Total Facade Area (m^2)	8.88	R _{rr}	Sound Reduction Index of Roof/Ceiling (Oct)			
S _{wi}	Window Area (m^2)	1.12	A	Equivalent Absorption Area of Rx Room			
S _{ew}	External Wall Area (m^2)	7.76	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)			
S _{rr}	Ceiling Area (m^2)	12					
S	Total Area sound enters the room (m^2)	20.88					
Frequency Dependent Variables							
Term	Description	Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff	Free-Field External Noise Level	55	51	49	49	46	39
D _{n,e}	Ryttons AAC125HP Look Ryt	42	37	34	43	57	64
R _{wi}	4_12_4	24	20	25	35	38	35
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00
BS8233 Calculation Details							
Term From Equation Below		Octave Band Centre Frequency					
		125	250	500	1000	2000	4000
Leq,ff		55	51	49	49	46	39
A _o /S . 10^(-D _{n,e} /10)		3.02E-05	9.56E-05	0.000191	2.4E-05	9.56E-07	1.91E-07
S _{wi} /S . 10^(-R _{wi} /10)		0.000214	0.000536	0.00017	1.7E-05	8.5E-06	1.7E-05
S _{ew} /S . 10^(-R _{ew} /10)		2.95E-05	4.68E-05	1.48E-05	2.34E-06	3.72E-07	1.18E-07
S _{rr} /S . 10^(-R _{rr} /10)		0.000911	0.000229	2.88E-05	2.88E-05	2.88E-05	2.88E-05
10log10(S/A)+3		5.783378	4.736025	4.156105	4.156105	4.436392	4.436392
Leq,2		31.51741	25.31469	19.21871	11.73633	6.305914	0.070995
A-Weighting		-16.1	-8.6	-3.2	0	1.2	1
A-Weighted Leq		15.41741	16.71469	16.01871	11.73633	7.505914	1.070995
A-Weighted Level Outside		53	Flat 5 Bedroom 2				
BS8233 Predicted Internal A-Weighted Level		22					
Predicted Building Envelope SRI		32					
BS8233 Calculation can be seen below:							
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$							

Non Frequency Dependent Variables			Key for Table Below					
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)				
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)				
S _f	Total Facade Area (m^2)	21.12	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)				
S _{wi}	Window Area (m^2)	4.9	A	Equivalent Absorption Area of Rx Room				
S _{ew}	External Wall Area (m^2)	16.22	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)				
S _{rr}	Ceiling Area (m^2)	0.00001						
S	Total Area sound enters the room (m^2)	21.12001						
Frequency Dependent Variables								
Term	Description	Octave Band Centre Frequency						
		125	250	500	1000	2000	4000	
Leq,ff	Free-Field External Noise Level	55	51	49	49	46	39	
D _{n,e}	2x Greenwood 5000	36.5	34.3	32.5	29	28	30.5	
R _{wi}	4_12_4	24	20	25	35	38	35	
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65	
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43	
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00	
BS8233 Calculation Details								
Term From Equation Below	Octave Band Centre Frequency							
	125	250	500	1000	2000	4000		
Leq,ff	55	51	49	49	46	39		
A _o /S . 10^(-D _{n,e} /10)	0.000106	0.000176	0.000266	0.000596	0.00075	0.000422		
S _{wi} /S . 10^(-R _{wi} /10)	0.000924	0.00232	0.000734	7.34E-05	3.68E-05	7.34E-05		
S _{ew} /S . 10^(-R _{ew} /10)	6.1E-05	9.67E-05	3.06E-05	4.85E-06	7.68E-07	2.43E-07		
S _{rr} /S . 10^(-R _{rr} /10)	7.5E-10	1.88E-10	2.37E-11	2.37E-11	2.37E-11	2.37E-11		
10log10(S/A)+3	5.833014	4.785661	4.205741	4.205741	4.486029	4.486029		
Leq,2	31.20984	29.92314	23.33625	21.49424	19.45108	10.43737		
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1		
A-Weighted Leq	15.10984	21.32314	20.13625	21.49424	20.65108	11.43737		
A-Weighted Level Outside		53					Flat 4 Bedroom 1	
BS8233 Predicted Internal A-Weighted Level		27						
Predicted Building Envelope SRI		26						
BS8233 Calculation can be seen below:								
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$								

Non Frequency Dependent Variables			Key for Table Below					
Term	Derivation	Value	R _{wi}	Sound Reduction of Window (Octave)				
A _o	Given in BS EN 20140-10 = 10 (m^2)	10	R _{ew}	Sound Reduction Index of External Wall (Octave)				
S _f	Total Facade Area (m^2)	8.88	R _{rr}	Sound Reduction Index of Roof/Ceiling (Octave)				
S _{wi}	Window Area (m^2)	1.12	A	Equivalent Absorption Area of Rx Room				
S _{ew}	External Wall Area (m^2)	7.76	D _{n,e}	Insulation of Trickle Vent (BS EN 20140-10)				
S _{rr}	Ceiling Area (m^2)	0.00001						
S	Total Area sound enters the room (m^2)	8.88001						
Frequency Dependent Variables								
Term	Description	Octave Band Centre Frequency						
		125	250	500	1000	2000	4000	
Leq,ff	Free-Field External Noise Level	55	51	49	49	46	39	
D _{n,e}	2x Greenwood 5000	36.5	34.3	32.5	29	28	30.5	
R _{wi}	4_12_4	24	20	25	35	38	35	
R _{ew}	Cavity Masonry (Brick Cavity with Insulation lightweight block)	41	39	44	52	60	65	
R _{rr}	Tile on Felt, Pitched Roof, 100mm mineral wool on plasterboard ceiling	28	34	43	43	43	43	
A	Equivalent Absorption Area of Room (Copied from BS8233)	11.00	14.00	16.00	16.00	15.00	15.00	
BS8233 Calculation Details								
Term From Equation Below	Octave Band Centre Frequency							
	125	250	500	1000	2000	4000		
Leq,ff	55	51	49	49	46	39		
A _o /S . 10^(-D _{n,e} /10)	0.000252	0.000418	0.000633	0.001418	0.001785	0.001004		
S _{wi} /S . 10^(-R _{wi} /10)	0.000502	0.001261	0.000399	3.99E-05	2E-05	3.99E-05		
S _{ew} /S . 10^(-R _{ew} /10)	6.94E-05	0.00011	3.48E-05	5.51E-06	8.74E-07	2.76E-07		
S _{rr} /S . 10^(-R _{rr} /10)	1.78E-09	4.48E-10	5.64E-11	5.64E-11	5.64E-11	5.64E-11		
10log10(S/A)+3	2.070208	1.022854	0.442935	0.442935	0.723222	0.723222		
Leq,2	26.22758	24.55058	19.72418	21.09569	19.28956	9.909481		
A-Weighting	-16.1	-8.6	-3.2	0	1.2	1		
A-Weighted Leq	10.12758	15.95058	16.52418	21.09569	20.48956	10.90948		
A-Weighted Level Outside		53					Flat 4 Bedroom 2	
BS8233 Predicted Internal A-Weighted Level		25						
Predicted Building Envelope SRI		28						
BS8233 Calculation can be seen below:								
$L_{eq,2} = L_{eq,ff} + 10 \log_{10} \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \log_{10} \left(\frac{S}{A} \right) + 3$								

11 Appendix B – INSUL Wall Build Up (Timber Frame-New Build Rear Extension)

