



Acoustic Survey and Assessment for Proposed Commercial and Residential development at 187 Yorkshire Street, Rochdale, OL12 0DS.

Prepared for:

Building Design Services
418 Bury Road
Rochdale
OL11 5EU

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1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic survey and assessment to support a planning application for the change of use of 187 Yorkshire Street, Rochdale, OL12 0DS from offices to commercial units on the ground floor and residential to the first floor.

Site Location and Context

- 1.2. The development site is situated to the north of Yorkshire Street, on the corner with Regent Street. Consisting of a two-storey brick built building. To the rear north of the site is a court yard and additional two storey property fronting Jermyn Street. Additional residential properties lie to the east along a terrace row. A mixture of commercial and residential properties run along Yorkshire Street.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. This report has been commissioned to identify what if any impact the prevailing sound levels will have on the proposed residential units.



2. Policy and Guidance

- 2.1. The impact of noise can be a material consideration in the determination of planning applications. The planning system has the task of guiding development to the most appropriate locations. It is recognised that on occasions it will be difficult to reconcile some land uses, such as housing, hospitals, or schools, with other activities that generate high levels of noise. However, the planning system is tasked to ensure that, wherever practicable, noise-sensitive developments are separated from major sources of noise (such as road, rail and air transport and certain types of industrial development).
- 2.2. The Government's publication of the National Planning Policy Framework (NPPF), updated in September 2023, states that planning policies and decisions should prevent new and existing development from contributing to or being put at unacceptable risk from, of being adversely affected by unacceptable levels of noise pollution.
- 2.3. The Government have also issued the Noise Policy Statement for England (NPSE). The NPSE clarifies the Government's underlying principles and aims in relation to noise and sets a vision to promote good health and a good quality of life through the effective management of noise while having regard to the Government's sustainable development strategy. The NPSE aims to mitigate and minimise adverse impacts on health and quality of life through the effective management and control of noise.
- 2.4. The NPSE introduces the following terms, although no sound levels are given to represent these, many authorities have identified the sound level criteria in line with the World Health Organisation, BS8233:2014 and BS4142: 2014 levels. The terms introduced by the NPSE are:
- NOEL – No Observed Effect Level (<30dB(A) inside <50dB(A) outside, 10dB below background)
- LOAEL – Lowest Observed Adverse Effect Level (30-35dB(A) inside 50-55dB(A) outside, background to +5dB)
- SOAEL – Significant Observed Adverse Effect Level (>35dB(A) inside, >55dB(A) outside, >+10dB above background)
- 2.5. The sound levels within the brackets of the previous paragraph are those determined as appropriate levels to indicate the relevant effect levels represented by the NPSE.



- 2.6. Other commonly used examples of standards utilised by Local Planning authorities for the consideration of noise impacts include comparison of the likely noise levels to be experienced at a development, with levels that have been recommended by the World Health Organisation (WHO) as Guidelines for the prevention of Community Noise Annoyance and within BS8233: 2014.
- 2.7. The WHO recommended noise levels for outdoor amenity areas (gardens) that should not be exceeded are 55dB(A) $L_{Aeq,16hr}$ in order to avoid 'Serious Community Annoyance' or 50dB(A) $L_{Aeq,16hr}$ to avoid 'Moderate Community Annoyance' during the day. For indoor levels WHO set 35dB(A) $L_{Aeq,16hr}$ during the day to prevent Moderate Annoyance and 30 dB(A) $L_{Aeq,8hr}$ at night to prevent sleep disturbance.
- 2.8. The WHO guidance also recommends that maximum sound levels at night should not regularly exceed 45dB(A) within bedrooms to prevent sleep disturbance. Regularly is considered to be more than 10 times during any 8-hour night-time period.
- 2.9. BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' also specifies desirable noise levels to be achieved inside dwellings.
- 2.10. BS 8233:2014 'Sound insulation and noise reduction for buildings – Code of Practice' also specifies desirable noise levels to be achieved inside dwellings. BS 8233 presents two levels, the first between the hours of 07:00 – 23:00 and the second between 23:00 -07:00.
- 2.11. The daytime period suggests internal noise levels of 35dB $L_{Aeq,16hr}$, for resting in living rooms and bedrooms while for night-time a level of 30dB $L_{Aeq,8hr}$ is recommended. Criteria for external areas mirrors that within the WHO guidance.
- 2.12. In addition, the 'ProPG Planning & Noise, Professional Practice Guidance on Planning & Noise, New Residential Development' provides a 4-staged approach to undertaking a risk assessment in relation to anticipated sound levels at new residential development and the provision of mitigation measures. The guidance is principally aimed at sites exposed predominantly to noise from transportation sources.

2.13. The first stage consists of an initial noise risk assessment, based on indicative day and night-time *noise* levels. Simply put, the higher the ambient noise in an area the greater the impact. The levels given are shown below although it should be noted that these are in excess of both the WHO and BS 8233: 2014 guidance.

Noise Risk Category*	Potential Effect if Unmitigated	Pre-Planning Application Guidance
0 – Negligible $L_{Aeq,16hr} < 50dB$ $L_{Aeq,8hr} < 40dB$	May be noticeable but no adverse effect on health and quality of life	In this category the development is likely to be acceptable from a noise perspective, nevertheless a good acoustic design process is encouraged to improve the existing environment and/or safeguard against possible future deterioration and to protect any designated tranquil areas. A noise assessment may be requested to demonstrate no adverse impact from noise. Application need not normally be delayed on noise grounds.
1 – Low $L_{Aeq,16hr} 50-63dB$ $L_{Aeq,8hr} 40-55dB$	Adverse effect on health and quality of life	In this category the development may be refused unless a good acoustic design process is followed and is demonstrated via a Level 1 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised and that a significant adverse impact will not arise in the finished development. Planning conditions and other measures to control noise may be required.
2 – Medium $L_{Aeq,16hr} 63-69dB$ $L_{Aeq,8hr} 55-60dB$ $L_{AFmax} > 80dB^{**}$	Significant adverse effect on health and quality of life	In this category the development is likely to be refused unless good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement which confirms how the adverse impacts of noise on the new development will be mitigated and minimised, and clearly demonstrates that a significant adverse noise impact will not arise in the finished development. Planning conditions and other measures to control noise will normally be required.
3 – High $L_{Aeq,16hr} > 69dB$ $L_{Aeq,8hr} > 60dB$ $L_{AFmax} > 80dB^{**}$	Unacceptable adverse effect of health and quality of life	In this category the development is very likely to be refused on noise grounds, even if a good acoustic design process is followed and is demonstrated via a Level 2 Acoustic Design Statement. Applicants are advised to seek expert advice on possible mitigation measures. Advice on the circumstances when the refusal of a new housing on noise grounds should normally be anticipated is included in the ProPG.

2.14. Stage 2, consists of a full assessment of the prevailing ambient noise and requires 4 elements to be considered:

- I. Element 1 – Good Acoustic Design
- II. Element 2 – Internal Noise Level Guidelines
- III. Element 3 – External Amenity Area Noise Assessment
- IV. Element 4 – Assessment of Other Relevant Issues

2.15. A good acoustic design is implicit in meeting the requirements of the NPPF and can help to resolve many potential acoustic issues.



- 2.16. Details of the criteria considered suitable are provided above for both internal and external sound levels. Element 4 includes such issues as local and national policy, likely occupants, wider planning objectives.

3. The Assessment

- 3.1 In order to obtain representative background sound levels for the area on site monitoring was undertaken over the 20th*22nd September 2023.
- 3.2 The sound level meter, a Cirrus Optimus Green CR:171C unit was placed 1m from the front façade of the property overlooking the busy Yorkshire Street.
- 3.3 The meter was field calibrated at the start and end of the monitoring period with no significant variation and full laboratory calibration certificates are available on request.
- 3.4 The weather during the monitoring was largely dry with little to no wind. A slight shower was experienced on the first evening and last morning of the final day. This is not consider to have adversely impacted on the resulting sound levels, if anything the prevailing level being slightly higher due to the wet road.
- 3.5 The full results are shown in Appendix A, with a summary in the tables below.

Start Time	End Time	Duration	L _{Aeq}	L _{A90}	L _{AMax}
20/09/2023 19:00	20/09/2023 23:00	03:59:59	69.9	60.6	96.5
20/09/2023 23:00	21/09/2023 07:00	08:00:00	66.8	40.5	94.7
21/09/2023 07:00	21/09/2023 23:00	16:00:00	70.3	62.5	104.5
21/09/2023 23:00	22/09/2023 07:00	08:00:00	66.9	39.2	94.7
22/09/2023 07:00	22/09/2023 10:00	03:00:00	74.1	64.7	108

- 3.6 Background sound levels were dominated by passing traffic throughout the day and night with maximum nighttime sound levels also dominated by passing vehicles. The maximum sound level regularly exceeded has been identified at 85.5dB(A).



- 3.7 Given a 15dB attenuation¹ for an open window the sound levels to be experienced by the future occupants are above those identified within the guidance documents detailed in section 2 of the report. Therefore, further mitigation measures are required.
- 3.8 A calculation in accordance with Annex G of BS8233:2014 “More Rigorous” Calculation method has been undertaken to determine the impact on the proposed residential units.
- 3.9 The results of the above calculations are contained within Appendix B and identified that a standard 6/12/6 double glazing unit will provide a sufficient sound reduction when closed to protect the future occupants of the property.
- 3.10 It is further advised to install the same specification to the western elevation on Regent Street and to the rear of the property.
- 3.11 In order to be able to keep windows closed additional ventilation provision must be made for the property. As such it is recommended that a ventilation system is used incorporating acoustic trickle ventilators for all windows to habitable rooms to the proposed properties. The ventilators must achieve a similar or better performance to the windows when open and a number of suitable models are available from suppliers including the Greenwood DN Vent providing 34dB (C_{tr}) attenuation or the Titon, Trimvent Select S13 Ventilator providing 33dB (C_{tr}) attenuation. Other models and manufacturers are available.
- 3.12 Care must be taken to ensure that windows are well fitted and gaps between the window frame and the brick work are minimised. Where gaps do occur, these should be filled with a suitable acoustic material, not expandable foam. The window frame should be sealed across the full depth of the frame and not just around the edges. This will ensure that sound does not ‘leak’ around the edge of the frame.
- 3.13 The ground floor units will be converted to commercial uses, the final use is currently unknown but no external plant is proposed as part of the development. As such the impact from this use is considered to be minimal for neighbouring properties.

¹ BS8233: 2014; Guidance on sound insulation and noise reduction for buildings



- 3.14 There is however a potential from the ground floor uses to adversely impact on the first floor accommodation and vice versa. As such a specification for upgrading the acoustic attenuation between the floors has been identified. This includes a new dropped ceiling on the ground floor with two layers of soundbloc plasterboard and a new flooring to the first. The resulting structure providing R_w 63dB attenuation, see Appendix C.
- 3.15 Assuming an excessively high internal sound level of 85dB in the ground floor units, equivalent to the upper action level within the Control of Noise at Work Regulations the resulting first floor sound level will be 22dB(A), below the night-time recommended sound level to avoid sleep disturbance identified in the above guidance documents.



4 Conclusion

- 4.1 On-site monitoring has identified existing background sound levels will result in an adverse impact on the proposed residential properties to the front of the development. As such additional mitigation measures are required.
- 4.2 Calculations have identified that a standard double-glazed window unit with trickle window vents will ensure a suitable internal sound level is achieved along with a suitable level of ventilation.
- 4.3 A specification for the separating ceiling/floor between the proposed commercial and residential units has also been identified and shown to provide sufficient attenuation to maintain adequate internal sound levels across the separating structure.
- 4.4 The inclusion of the above mitigation measures to all habitable rooms will ensure that the internal sound levels are acceptable and will result in a No Observe Effect on the future residents in line with the Noise Policy Statement for England.
- 4.5 As such the development will meet the objectives of the National Planning Policy Framework in ensuring that no significant adverse impact is experienced by the future residents. The development is therefore considered to be acceptable in terms of noise.

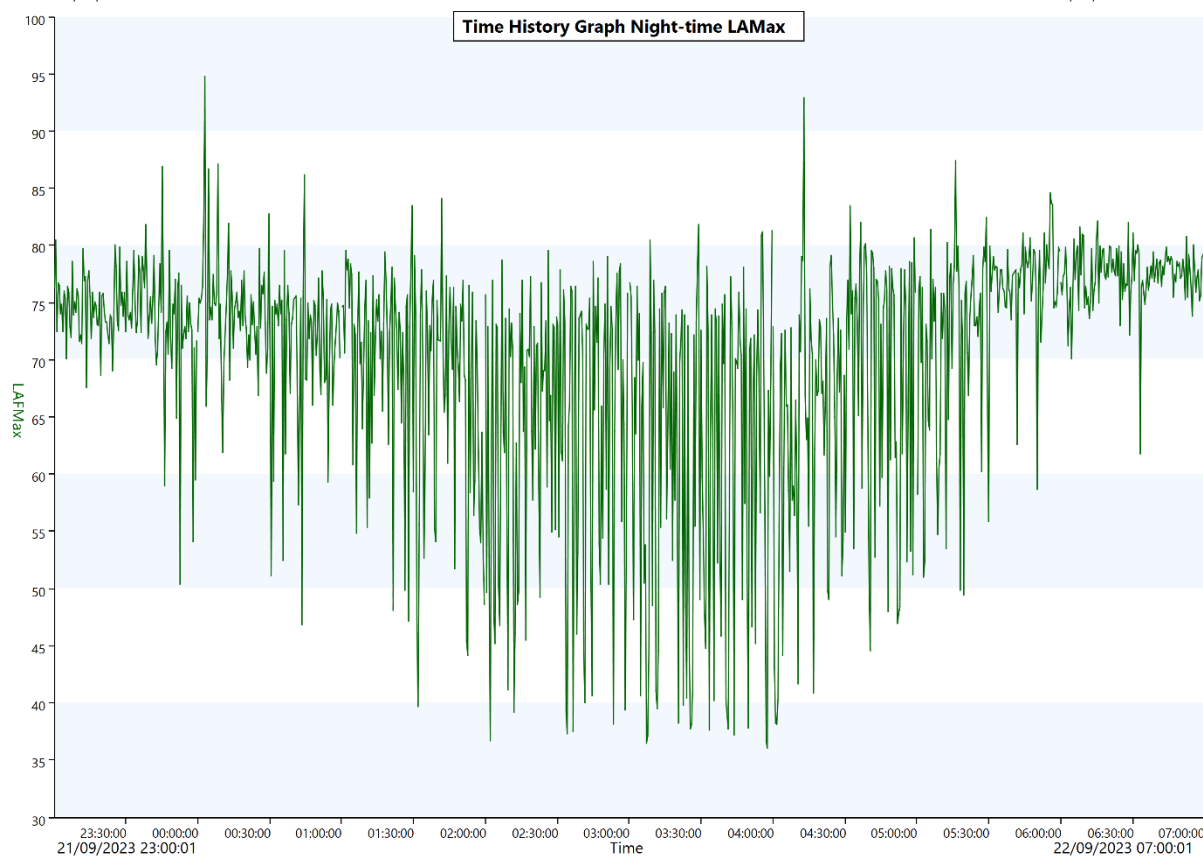
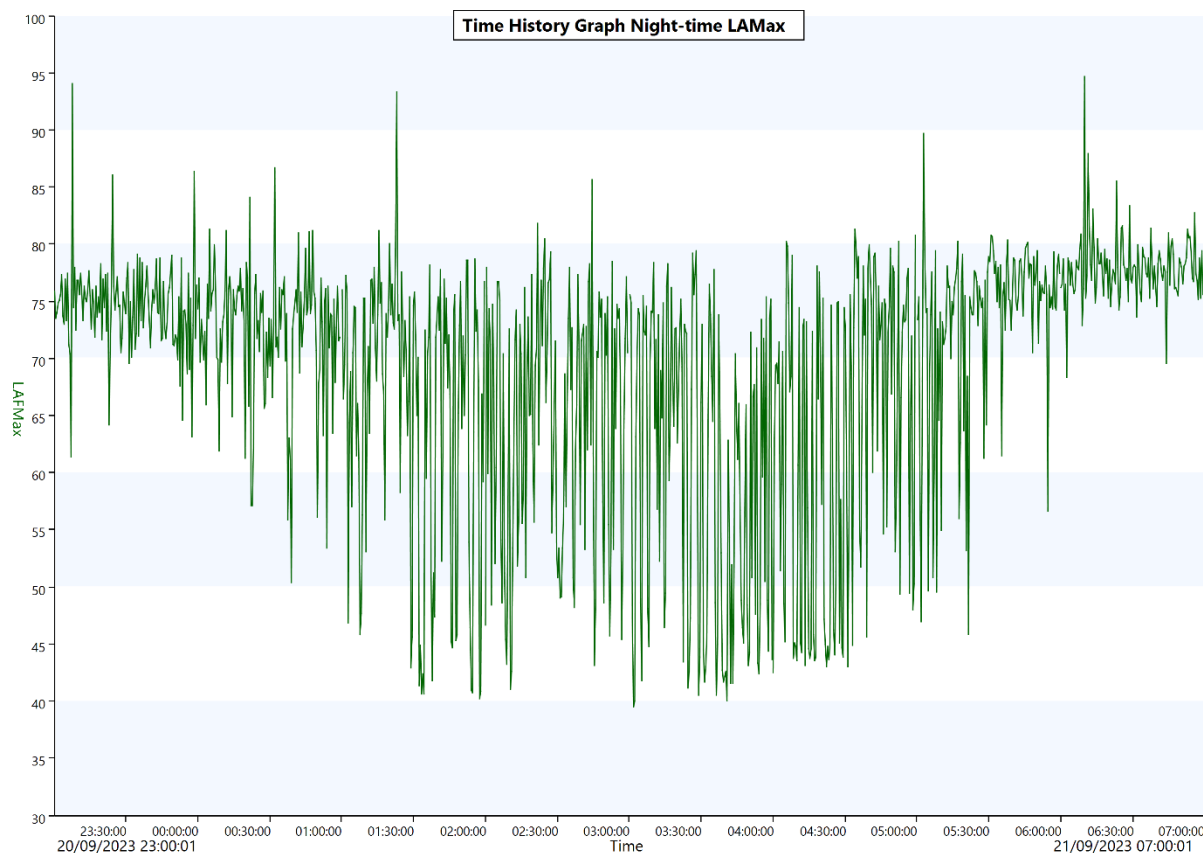
Figure 1 – Aerial Photograph





Appendix A – Full Monitoring Results

Time	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
20/09/2023 19:00	70.1	90.0	63.9
20/09/2023 20:00	70.2	92.3	61.9
20/09/2023 21:00	70.0	92.4	59.6
20/09/2023 22:00	69.3	96.5	58.0
20/09/2023 23:00	68.0	94.0	53.5
21/09/2023 00:00	65.9	86.6	47.5
21/09/2023 01:00	64.1	93.3	39.5
21/09/2023 02:00	62.5	85.7	39.8
21/09/2023 03:00	60.4	79.5	38.6
21/09/2023 04:00	63.0	81.3	39.2
21/09/2023 05:00	67.9	89.6	45.9
21/09/2023 06:00	71.6	94.7	60.3
21/09/2023 07:00	72.6	89.2	65.3
21/09/2023 08:00	69.5	83.9	63.0
21/09/2023 09:00	70.9	84.0	64.6
21/09/2023 10:00	70.9	93.8	63.5
21/09/2023 11:00	69.9	91.5	63.4
21/09/2023 12:00	70.1	87.3	63.4
21/09/2023 13:00	69.8	89.1	64.1
21/09/2023 14:00	69.3	88.7	63.3
21/09/2023 15:00	67.5	95.6	61.2
21/09/2023 16:00	70.3	100.0	61.2
21/09/2023 17:00	69.0	91.0	62.5
21/09/2023 18:00	70.3	93.9	63.4
21/09/2023 19:00	73.4	104.5	64.0
21/09/2023 20:00	70.0	87.8	62.6
21/09/2023 21:00	69.5	93.2	60.1
21/09/2023 22:00	68.6	85.7	56.6
21/09/2023 23:00	67.6	86.9	52.8
22/09/2023 00:00	67.0	94.7	46.9
22/09/2023 01:00	64.3	84.1	41.6
22/09/2023 02:00	61.6	79.5	36.6
22/09/2023 03:00	61.3	81.8	35.5
22/09/2023 04:00	65.1	92.9	37.5
22/09/2023 05:00	68.4	87.4	46.5
22/09/2023 06:00	71.2	82.1	59.4
22/09/2023 07:00	73.0	86.3	65.5
22/09/2023 08:00	76.3	108.0	64.0
22/09/2023 09:00	71.4	87.8	65.0



Appendix B – Annex G – More Rigorous Calculations

Bedroom 1 – Daytime

	Description	Value
Sf	Total Façade area (m2)	27.19
Swi	Window Area (M2)	4.09
Sew	External wall area (m2)	23.10
Srr	Area of ceiling (m2)	18.997
S	Total area of elements (sf + Srr)	46.18
V	Volume of receiving room (m3)	58.89
A0	Reference absorption area (m2)	10
	Number of ventilators in façade	2
A		95.778

	Description	Single figure rating	Octave band frequency Hz						
			63	125	250	500	1000	2000	4000
LAeq	LAeq daytime	70.3	74.2	66.7	66.3	64.6	67.3	63.4	55.4
Lff		65.8	69.7	62.2	61.8	60.1	62.8	58.9	50.9
Dn,e	2500EAW.AC1 - Greenwood	45	30	41	40	36	47	43	46
Rwi	6/12/6 glazing	35	23	25	21	35	42	41	40
Rew	9 inch solid	55	41	39	44	52	59	63	68
Rrr	Slate, 150mm insulation, 15mm pl	54	17	35	45	52	57	57	59
internal level			49.0	28.9	30.4	19.4	13.2	11.5	2.5
A-weighting			-26.2	-16.1	-8.6	-3.2	0	1.2	1
Internal A-weight		26.5	22.8	12.8	21.8	16.2	13.2	12.7	3.5

Night-time Max

	Description	Single figure	Octave band frequency Hz						
			63	125	250	500	1000	2000	4000
LAeq	LAeq Night-time Max	85.5	75	73.4	81.3	80.9	80.6	75.5	67.1
Lff		81	70.5	68.9	76.8	76.4	76.1	71	62.6
Dn,e	2500EAW.AC1 - Greenwood	45	30	41	40	36	47	43	46
Rwi	6/12/6 glazing	35	23	25	21	35	42	41	40
Rew	9 inch solid	55	41	39	44	52	59	63	68
Rrr	Slate, 150mm insulation, 15mm plaster	54	17	35	45	52	57	57	59
internal level			49.8	35.6	45.4	35.7	26.5	23.6	14.2
A-weighting			-26.2	-16.1	-8.6	-3.2	0	1.2	1
Internal A-weight		38.9	23.6	19.5	36.8	32.5	26.5	24.8	15.2

Bedroom 2 – Daytime

	Description	Value
Sf	Total Façade area (m2)	8.525
Swi	Window Area (M2)	2.1
Sew	External wall area (m2)	6.425
Srr	Area of ceiling (m2)	12.1
S	Total area of elements (sf + Srr)	20.625
V	Volume of receiving room (m3)	37.51
A0	Reference absorption area (m2)	10
	Number of ventilators in façade	1

	Description	Single figure	Octave band frequency Hz						
			63	125	250	500	1000	2000	4000
LAeq	LAeq daytime	70.3	74.2	66.7	66.3	64.6	67.3	63.4	55.4
Lff		65.8	69.7	62.2	61.8	60.1	62.8	58.9	50.9
Dn,e	2500EAW.AC1 - Greenwood	45	30	41	40	36	47	43	46
Rwi	6/12/6 glazing	35	23	25	21	35	42	41	40
Rew	9 inch solid	55	41	39	44	52	59	63	68
Rrr	Slate, 150mm insulation, 15mm plaster	54	17	35	45	52	57	57	59
internal level			48.5	27.7	29.1	19.9	13.1	12.0	2.3
A-weighting			-26.2	-16.1	-8.6	-3.2	0	1.2	1
Internal A-weight		25.9	22.3	11.6	20.5	16.7	13.1	13.2	3.3

Night-time Max

	Description	Single figure	Octave band frequency Hz						
			63	125	250	500	1000	2000	4000
LAeq	LAeq night-time Max	85.5	75	73.4	81.3	80.9	80.6	75.5	67.1
Lff		81	70.5	68.9	76.8	76.4	76.1	71	62.6
Dn,e	2500EAW.AC1 - Greenwood	45	30	41	40	36	47	43	46
Rwi	6/12/6 glazing	35	23	25	21	35	42	41	40
Rew	9 inch solid	55	41	39	44	52	59	63	68
Rrr	Slate, 150mm insulation, 15mm plaster	54	17	35	45	52	57	57	59
internal level			49.3	34.4	44.1	36.2	26.4	24.1	14.0
A-weighting			-26.2	-16.1	-8.6	-3.2	0	1.2	1
Internal A-weight		38.2	23.1	18.3	35.5	33.0	26.4	25.3	15.0

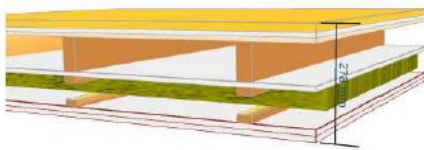
Appendix C – Separating Floor/Ceiling Specification

Sound Insulation Prediction (v9.0.24)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within $R_w \pm 3$ dB
Martin Environmental Solutions Ltd - Key No. 2594
Job Name:
Job No.: Initials:info
Date:26/09/2023
File Name:insul



Notes:



R_w 63 dB
C -3 dB
Ctr -9 dB

Mass-air-mass resonant frequency = 41 Hz, 114 Hz

Panel Size = 2.7 m x 4.0 m

Partition surface mass = 64.3 kg/m²

System description

Panel 1 : 1 x 20 mm Flooring Particle Board
+ 1 x 12.5 mm SoftBoard

+ 1 x 12.5 mm Knauf Impact Panel 12.5mm

Frame: Solid Joist (1E2 mm x 45 mm), Stud spacing 600 mm; Cavity Width 100.1 mm
Panel 2 : 1 x 12.5 mm Gyproc Wallboard 12.5mm

Frame: Separate Joists (20 mm x 45 mm), Stud spacing 600 mm; Cavity Width 90 mm, 1 x Fibreglass (10kg/m³) Thickness 60 mm
Panel 3 : 2 x 15 mm Gyproc SoundBloc 15mm

freq.(Hz)	R(dB)	R(dB)
50	20	
63	29	24
80	35	
100	39	
125	38	39
160	42	
200	48	
250	55	52
315	61	
400	67	
500	73	71
630	80	
800	89	
1000	92	91
1250	95	
1600	97	
2000	104	100
2500	107	
3150	107	
4000	116	111
5000	125	

