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Acoustic Survey and Assessment for Proposed residential dwelling at Dale Inn, 408 Wakefield Road, Denby Dale, Huddersfield, HD8 8RP.

Prepared for:

APD Architecture and Design,
The Old Police Station,
16 Bridge Lane,
Holmfirth,
HD9 7AN.

August 2024

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1. Introduction

1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic survey and assessment to support a discharge of planning conditions for a mixed ground floor retail and first floor residential building on land to the rear of The Dale Inn, 408, Wakefield Road, Denby Dale, Huddersfield, HD8 8RP.

Site Location and Context

1.2. The development site is situated to the rear and west of the former Dale Inn public house, now, residential apartments, to the west are existing terrace housing fronting onto Wakefield Road which runs to the south of the site and forms the main road running through the town. Further housing exists on the far side of the road. To the north is the access road which terminates to the west at a residential property and to the north into a small housing estate of ~25 properties.

1.3. An aerial Photograph is enclosed in Figure 1, together with a proposed layout drawing in Figure 2.

1.4. The conditions imposed by planning permission 2023/62/92462/E states

"12. Before construction work commences, a noise assessment report by a suitably competent person shall be submitted to and approved in writing by the Local Planning
Authority. The report shall include:
a) an assessment of all of the noise emissions from the proposed development
b) details of existing background and predicted future noise levels at the boundary of the nearest noise sensitive premises
c) a written scheme of how the occupants of the above-mentioned noise sensitive premises will be protected from noise from the proposed development including details of all necessary noise attenuation The development shall not be brought into use until all works comprised within

the measures specified in the approved report have been carried out in full and such measures shall be thereafter retained.

Reason: *This pre-commencement condition is necessary to ensure the proposed development does not cause harmful noise pollution within neighbouring noise sensitive locations, in the interest of amenity, to comply with the aims and objectives of Policies LP24 and LP52 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning*
Policy Framework.

13. Before construction work commences, a report specifying the measures to be taken to protect the development from noise from all significant noise sources that are likely to affect the proposed development e.g. road traffic/commercial premises etc. shall be submitted to and approved in writing by the Local Planning Authority. The report shall:
a) Determine the existing noise climate
b) Predict the noise climate in living rooms and gardens (daytime), bedrooms (night-time) and other habitable rooms of the development
c) Detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required).
The development shall not be occupied until all works specified in the approved report have been carried out in full and such works shall be thereafter retained.

Reason: *This pre-commencement condition is necessary to protect the amenity of occupiers of the proposed development from noise or disturbance from nearby noise generating premises to accord with the aims of Policies LP24 and LP52 of the Kirklees*
Local Plan and Chapters 12 and 15 of the National Planning Policy Framework.

14. Before the development is brought into use written evidence to demonstrate that the airborne sound insulation performance of the party floors/walls/ceiling of the development is of a minimum of 55dB Dntw + Ctr shall be submitted to and approved in writing by the Local Planning Authority. If it cannot be demonstrated that the aforementioned airborne sound insulation performance has been achieved, a scheme incorporating further

measures to achieve the sound insulation performance shall be submitted to and approved in writing by the Local Planning Authority. All works comprised within those further measures shall be completed and further written evidence to demonstrate that the aforementioned sound insulation performance level has been achieved shall be submitted to and approved in writing by the Local Planning Authority before the development is first brought into use.

Reason: *This pre-commencement condition is necessary to protect the amenity of occupiers of the proposed development from noise or disturbance from nearby noise generating premises to accord with the aims of Policies LP24 and LP52 of the Kirklees*

Local Plan and Chapters 12 and 15 of the National Planning Policy Framework."

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 December 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 LAeq,8hr is recommended. Criteria for external areas mirrors that within the WHO guidance.

2.12. Another commonly used standard is British Standard 4142:2014 'Method for rating industrial and commercial sound' compares the sound predicted by the source in question against the background, L_{A90} sound levels.

2.13. The "residual" L_{Aeq} measurement is then subtracted from the "ambient" L_{Aeq} measurement (with the sound source) to calculate the sound level created by the "problem" sound alone -termed the "specific" sound level.

2.14. If the "problem" sound is tonal, such as whine or hum, or if it is impulsive such as bangs or clatters or if it is irregular enough to attract attention a correction is added to the "specific level" to produce the "rating level". The "background" L_{A90} measurement is then compared against the "rating level".

2.15. If the "rating level" exceeds the "background" by around 10dB(A) or more this "indicates a significant adverse impact". A difference of around 5dB(A) 'indicates an adverse impact. The lower the commercial noise level is, the lower the likely impact.

2.16. 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.

2.17. 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.

2.18. 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

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

2.20. 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

The development

3.1 The proposed development consists of the erection of one building. The ground floor is to be a retail unit fronting onto the main road to the south, with access to the rear. The first floor is to be a residential apartment accessed from the rear.

3.2 The proposed retail unit will not include any external plant or equipment. The dividing structure between the ground and first floor will be based around a timer joist system.

Existing Situation.

3.3 In order to obtain representative background sound levels for the area on site monitoring was undertaken over the 23rd-25th July 2024.

3.4 A Cirrus Optimus Green sound level meter was utilised for the monitoring. The meter was placed over 1m from the façade of the existing Dale Inn property, through the top of a ground floor window overlooking the road to the south.

3.5 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.

3.6 The weather during the monitoring was dry, sunny and hot with little to no wind <5m/s. Confirmed by reviewing weather data at the time, observations on site and speaking to locals.

3.7 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}
23/07/2024 16:00	23/07/2024 23:00	06:59:59	68.0	42.2	96.8
23/07/2024 23:00	24/07/2024 07:00	08:00:00	62.1	25.0	90.4
24/07/2024 07:00	24/07/2024 23:00	16:00:00	69.1	48.2	97.8
24/07/2024 23:00	25/07/2024 07:00	08:00:00	62.2	26.3	92.2
25/07/2024 07:00	25/07/2024 12:00	05:00:01	70.2	52.5	97.4

3.8 Background sound levels were dominated by passing traffic on Wakefield Road with night-time maximum sound levels regularly exceeded at identified at 86.7dB(A).

Impact from Prevailing External Environmental Sound Levels

3.9 Given a 15dB attenuation[1] 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.

3.10 To the front of the property is located the kitchen and living room, as such daytime (07:00-23:00) recommended sound levels apply to this façade. To the rear, and protected by the majority of the prevailing sound levels is the bedroom, for which the day, night and night-time maximum sound levels are appropriate criterion.

3.11 The rear façade is not only pointing away from the main road but also set back at additional 9.5m from the monitoring position at the front, this distance will reduce sound levels from the main road (the dominant background sound source) by 10dB, plus the attenuation of the building itself.

3.12 Given the above and taking the attenuation of the full façade of each room into account a standard 6/12/6 double glazing unit will, when closed, provide a sufficient protection form the first-floor rooms ensuring that the internal sound levels at the front of the property are below the daytime criterion of 35dB $L_{Aeq,16hr}$ and to the rear below the daytime criterion of 35dB $L_{Aeq,16hr}$, night-time criterion of 30dB $L_{Aeq,8hr}$, and the night-time maximum criterion of 45dB L_{AMax}. See Appendix B for calculations.

3.13 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 of 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 area available.

3.14 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

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

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.

3.15 It is worth noting that the above provision does not prohibit the short opening of windows for purge ventilation of the property. The recommended trickle ventilation is design to achieve the required background ventilation for the property.

3.16 A consideration of the Building Regulations, and Approved Document O requirements around overheating is essential given the need for closed windows. The Regulations require adequate provision to be made for the removal of heat from the building and to limit solar gain.

3.17 Where the trickle ventilators do not provide sufficient 'free area', then additional provision to remove excess heat is required. Should additional wall or mechanical ventilation be used to achieve the 'free area' requirements, the chosen system must ensure that adequate acoustic attenuation is provided to achieve the required internal 35/30dB(A) day/night-time recommended levels.

Separating Structures

3.18 Condition 14 of the planning permission requires a minimum of 55dB $D_{nTw}+C_{Tr}$ attenuation to be provided between the ground floor retail unit and first floor residential apartment.

3.19 The separating structures are to be based around a standard wooden joist design. A variety of possible solutions are available to achieve the required reduction, for example the Gypsum White Book specifications or Robust details, one such design for the separating floor/ceiling and the separating wall between the entrance/staircase of the apartment and the ground floor are shown in Appendix C and will provide a level of attenuation in excess of the 55dB $D_{nTw}+C_{Tr}$ requirement.

Impact from the development on neighbouring properties.

3.20 The proposed development consists of a retail unit which will cannot operate outside of the hours 07:30-18:00 Monday to Friday, 07:00-18:00 Saturday and 09:00-17:00 on Sundays, with no deliveries outside of these hours or on Sundays or Bank holidays.

3.21 The final use of the site is currently unknown, but it is small in size and no external plant is to be installed. Sound levels from within the site are unlikely to be excessive, and limited to a few people talking, possible background music in the form of a radio.

An excessively high internal sound level of 80dB(A) has therefore been identified, equivalent to the lower action level within the Control of Noise at Work Regulations and highly unlikely to be reached within such a small retail unit.

3.22 Based on this internal sound level and the above specification for the separating structure the sound level within the first-floor apartment will be <25dB(A), below the daytime criterion of 35dB(A) identified above.

3.23 The nearest neighbouring property is the former Dale Inn property, located 2m to the east, given the reduction of the external wall being 46dB R_w, the façade sound level will be 22dB(A), substantially below the prevailing background sound level and the recommended external criterion of 50dB(A). Properties further away will experience an even lower sound level. The use of the ground floor retail unit is therefore unlikely to adversely impact on the neighbouring residential units.

3.24 In terms of deliveries given the size of the development deliveries are likely to be infrequent, arrive in small vehicles and be unloaded by hand. The sound levels will therefore be minimal and not dissimilar to current activities of people arriving and leaving for work at the surrounding properties.

3.25 The site is commercial as such it is appropriate to consider a BS4142:2-14+A1:2019 assessment of the impact of noise emissions on the surrounding properties. As detailed no external plant is to be installed and exaggerated internal sound levels have been shown not to result in any adverse impact on neighbouring properties.

3.26 The final use of the site is unknown as such corrections for tonality, intermittency and impulsivity have been applied but it has been assumed that the 80dB(A) internal sound level is continuous. A BS4142:2014 assessment is detailed below.

	Day	
Measured Ambient sound level		Site is not built and so no ambient sound level is present.
Residual Sound level	L_{Aeq} = 69.7dB	Average daytime level measured on site for operating hours
Background Sound Level	L_{A90} = 52.7dB	Average daytime level measured on site for operating hours

Reference period	60 minutes	Normal ref period,
Specific sound Level	L_{Aeq} = 22dB	Calculated to nearest property
Acoustic feature	+2 +3 +3	Tonal Impulsive Intermittent
Rating level	30dB	
Background sound level	L_{A90} = 52.7dB	
Excess of Rating level over background level	(30-52.7) dB = **-22.7dB** indicates no significant adverse impact	
Uncertainty		Final use of the site is unknown and internal sound levels are likely to be less than the presumed 80dB(A)

3.27 The assessment will not result in any adverse impact on the future residents.

3.28

4 Conclusion

4.1 On-site monitoring has identified existing background sound levels will result in an adverse impact on the proposed first floor apartment. As such additional mitigation measures are required.

4.2 These have been identified as standard double-glazing units with trickle window vents to ensure a suitable level of ventilation is achieved.

4.3 The above mitigation measures address condition 13 of the approved planning permission, ensuring an adequate level of protection is afforded to the first-floor apartment.

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.

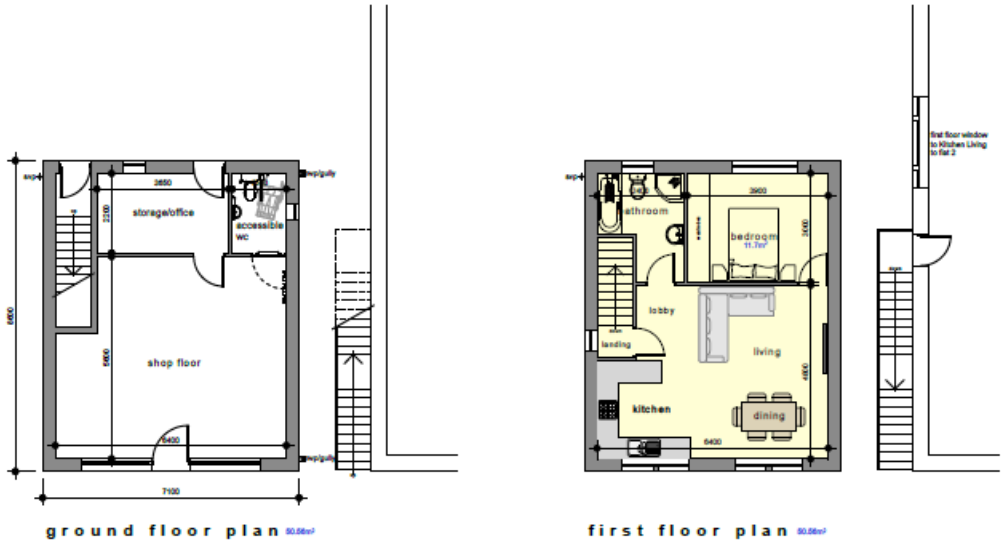
4.5 A consideration of the party structure between the ground and fist floor of the development has been undertaken and a proposed design specification identified to ensure the required 55dB $D_{nTw+}C_{Tr}$ level of attenuation is achieved as required by condition 14.

4.6 A consideration of the sound to be produced and emitted by the ground floor retail unit has been made, assuming worse-case internal sound levels. The results indicate no adverse impact on the neighbouring properties satisfying condition 12 of the planning permission.

4.7 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 or neighbouring properties from the development. The development is therefore considered to be acceptable in terms of noise.

Figure 1 – Aerial Photograph

Figure 2 – Proposed Layout Plan



Appendix A – Full Monitoring Results

Time	L_{Aeq} (dB)	L_{AMax} (dB)	L_{A90} (dB)
23/07/2024 16:00	70.0	91.6	53.3
23/07/2024 17:00	70.2	94.7	53.1
23/07/2024 18:00	68.6	88.5	49.1
23/07/2024 19:00	67.7	91.5	46.2
23/07/2024 20:00	67.2	96.8	41.3
23/07/2024 21:00	64.8	88.9	38.4
23/07/2024 22:00	63.4	87.2	33.8
23/07/2024 23:00	59.6	81.6	25.9
24/07/2024 00:00	57.2	87.5	24.8
24/07/2024 01:00	52.0	83.2	24.4
24/07/2024 02:00	52.4	82.5	24.8
24/07/2024 03:00	53.8	81.7	24.4
24/07/2024 04:00	57.1	82.6	25.7
24/07/2024 05:00	63.1	85.0	32.6
24/07/2024 06:00	69.3	90.4	46.6
24/07/2024 07:00	70.6	91.7	53.1
24/07/2024 08:00	70.2	95.5	53.2
24/07/2024 09:00	69.6	87.9	51.6
24/07/2024 10:00	69.2	88.7	52.7
24/07/2024 11:00	68.9	92.0	51.8
24/07/2024 12:00	69.6	94.9	52.4
24/07/2024 13:00	69.8	92.9	52.2
24/07/2024 14:00	69.3	91.6	50.9
24/07/2024 15:00	69.8	95.1	53.3
24/07/2024 16:00	70.4	92.8	54.9
24/07/2024 17:00	70.0	85.7	53.6
24/07/2024 18:00	69.5	97.8	50.6
24/07/2024 19:00	68.4	91.5	47.4
24/07/2024 20:00	66.8	93.1	41.8
24/07/2024 21:00	65.5	84.9	38.4
24/07/2024 22:00	62.0	84.5	32.2
24/07/2024 23:00	59.4	84.3	31.0
25/07/2024 00:00	56.1	88.5	30.6
25/07/2024 01:00	57.8	92.2	26.8
25/07/2024 02:00	51.1	79.2	25.5
25/07/2024 03:00	55.7	82.6	25.0
25/07/2024 04:00	58.8	90.3	24.5
25/07/2024 05:00	63.7	86.2	31.6
25/07/2024 06:00	68.9	91.1	44.7
25/07/2024 07:00	70.3	94.3	53.0
25/07/2024 08:00	70.2	89.2	52.9

25/07/2024 09:00	69.6	97.4	51.9
25/07/2024 10:00	69.2	92.2	51.1
25/07/2024 11:00	71.5	96.2	53.1

Appendix B – Facade Attenuation

Livingroom/Kitchen

Outdoor To Indoor Sound Transmission (v10.0.3)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within ±3 dB
- Key No. 2594
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Job No.: Initials:info
Date:09/08/2024
File Name:
Comment:

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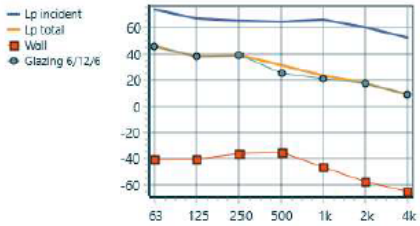

Source	Octave Band Centre Frequency (Hz) 63	125	250	500	1k	2k	4k	Overall dBA
Incident sound level (freefield)	74.0	67.4	65.3	65.0	66.5	60.3	52.9	69
Path								
Element 1 , STL	-43	-43	-39	-38	-49	-60	-68	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [24 m^2]	14	14	14	14	14	14	14	
Element sound level contribution	-40	-40	-36	-35	-46	-57	-65	-37
Element 2 , STL	-24	-25	-22	-35	-41	-38	-39	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [4.4 m^2]	6	6	6	6	6	6	6	
Element sound level contribution	45	38	39	25	21	18	9	32
Receiver								
Room volume(-10LogV) [77 m^3]	-19	-19	-19	-19	-19	-19	-19	
Reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10LogT)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	46	38	39	31	24	18	9	34
Level difference								LpAinc - LpARev,T0
D2m,nT	31	32	29	37	46	46	47	35

** Element descriptions: #1: Wall
#2: Glazing 6/12/6

Bedroom (distance attenuation only considered)

Daytime

Outdoor To Indoor Sound Transmission (v10.0.3)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within ±3 dB
- Key No. 2594
Job Name:
Job No.: Initials:info
Date:11/08/2024
File Name:
Comment:

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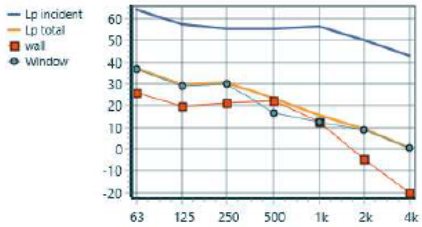


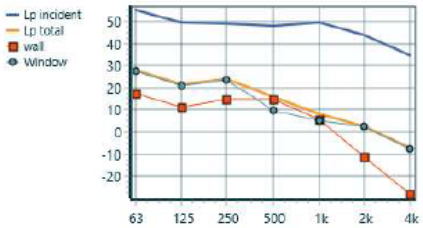
	Octave Band Centre Frequency (Hz)							
Source	63	125	250	500	1k	2k	4k	Overall dBA
Incident sound level (freefield)	64.0	57.4	55.3	55.0	56.5	50.3	42.9	59
Path								
Element 1 , STL	-43	-43	-39	-38	-49	-60	-68	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [15 m^2]	12	12	12	12	12	12	12	
Element sound level contribution	26	19	21	22	13	-5	-20	21
Element 2 , STL	-24	-25	-22	-35	-41	-38	-39	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [2.2 m^2]	3	3	3	3	3	3	3	
Element sound level contribution	37	29	30	17	12	9	1	23
Receiver								
Room volume(-10LogV) [29 m^3]	-15	-15	-15	-15	-15	-15	-15	
Reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10LogT)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	37	30	31	23	15	9	1	25
Level difference								LpAinc - LpARev,T0
D2m,nT	30	31	28	35	44	44	45	34

** Element descriptions: #1: wall
#2: Window

Night-time

Outdoor To Indoor Sound Transmission (v10.0.3)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within ±3 dB
- Key No. 2594
Job Name:
Job No.: Initials:info
Date:11/08/2024
File Name:
Comment:



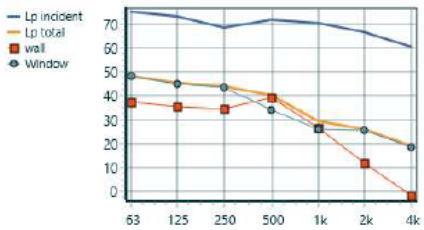
	Octave Band Centre Frequency (Hz)							
Source	63	125	250	500	1k	2k	4k	Overall dBA
Incident sound level (freefield)	55.1	49.4	48.9	47.8	49.5	43.8	34.9	52
Path								
Element 1 , STL	-43	-43	-39	-38	-49	-60	-68	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [15 m²]	12	12	12	12	12	12	12	
Element sound level contribution	17	11	15	15	6	-11	-28	14
Element 2 , STL	-24	-25	-22	-35	-41	-38	-39	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [2.2 m²]	3	3	3	3	3	3	3	
Element sound level contribution	28	21	24	9	5	2	-7	17
Receiver								
Room volume(-10LogV) [29 m³]	-15	-15	-15	-15	-15	-15	-15	
Reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10LogT)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	28	22	24	16	8	3	-7	18
Level difference								LpAinc - LpARev,T0
D2m,nT	30	31	28	35	44	44	45	34

** Element descriptions:
#1: wall
#2: Window

Night L_{AMax}

Outdoor To Indoor Sound Transmission (v10.0.3)

Program copyright Marshall Day Acoustics 2017
Margin of error is generally within ±3 dB
- Key No. 2594
Job Name:
Job No.: Initials:info
Date:11/08/2024
File Name:
Comment:



	Octave Band Centre Frequency (Hz)							
Source	63	125	250	500	1k	2k	4k	Overall dBA
Incident sound level (freefield)	75.4	73.5	68.7	72.2	70.5	66.9	60.9	75
Path								
Element 1 , STL	-43	-43	-39	-38	-49	-60	-68	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [15 m^2]	12	12	12	12	12	12	12	
Element sound level contribution	37	36	35	39	27	12	-2	37
Element 2 , STL	-24	-25	-22	-35	-41	-38	-39	
Facade Shape factor Level diff.	0	0	0	0	0	0	0	
Insertion Loss	0	0	0	0	0	0	0	
Area(+10LogA) [2.2 m^2]	3	3	3	3	3	3	3	
Element sound level contribution	48	45	43	34	26	26	19	38
Receiver								
Room volume(-10LogV) [29 m^3]	-15	-15	-15	-15	-15	-15	-15	
Reverberation time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
RT (+10LogT)	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	-3.0	
Equation Constant	11	11	11	11	11	11	11	
Room sound level	48	46	44	40	29	26	19	40
Level difference								LpAinc - LpARev,T0
D2m,nT	30	31	28	35	44	44	45	34

** Element descriptions: #1: wall
#2: Window

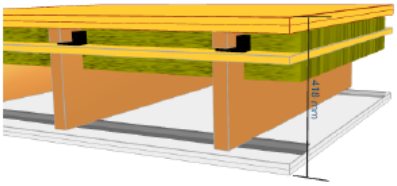
Appendix C – Proposed Internal Structures

Sound Insulation Prediction (v10.0.3)

Program copyright Marshall Day Acoustics 2017 | Margin of error is generally within Rw ±3 dB

Date: 10/08/2024

Job Name:

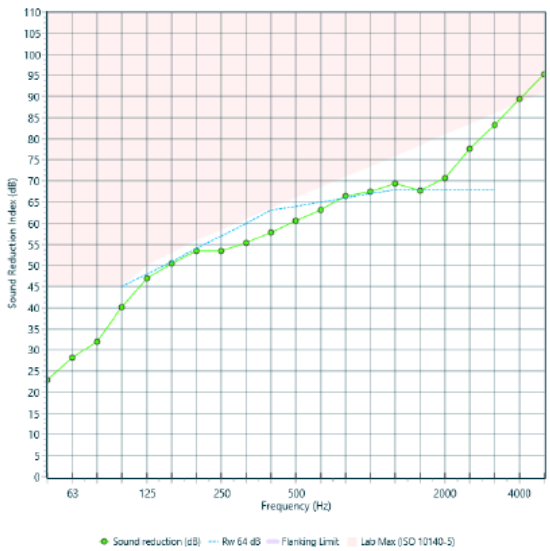


Rw 64 dB
C -2 dB
Ctr -7 dB

System description

Panel 1	2 x 20 mm Flooring Particle Board
Frame	Batten and Cradle (45 mm x 45 mm), Stud spacing 600 mm , Cavity Width 60 mm + 60 mm Fibreglass (10kg/m3) 60mm
Panel 2	1 x 20 mm Flooring Particle Board
Frame	Solid Joist with resilient rail (250 mm x 45 mm), Stud spacing 600 mm , Cavity Width 268 mm + 60 mm Fibreglass (10kg/m3) 60mm
Panel 3	2 x 15 mm Gyproc SoundBloc 15mm
Details	Panel Size 2.7 m x 4.0 m, Partition surface mass = 69 kg/m², Mass-air-mass resonant frequency = : 25 Hz, 73 Hz

freq.(Hz)	R(dB)	Roct (dB)
50	23	26
63	28	
80	32	
100	40	44
125	47	
160	51	
200	53	54
250	54	
315	55	
400	58	60
500	60	
630	63	
800	66	68
1000	67	
1250	69	
1600	68	70
2000	71	
2500	78	
3150	83	87
4000	89	
5000	95	



- Key No. 2594 | Initials:info | File Name:insul

Internal Wall to staircase

Sound Insulation Prediction (v10.0.3)

Program copyright Marshall Day Acoustics 2017 | Margin of error is generally within Rw ±3 dB

Date: 10/08/2024

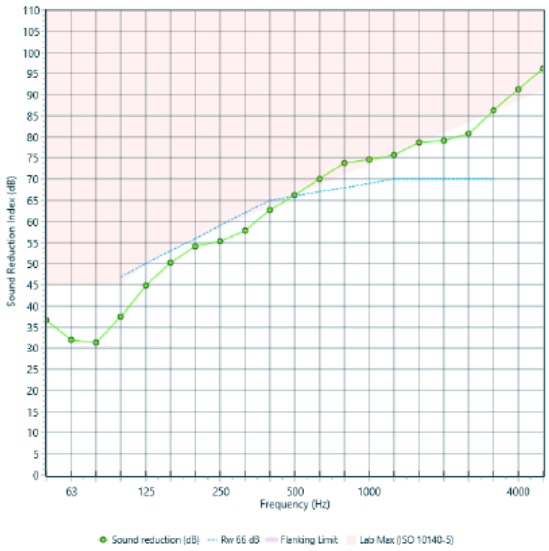
Job Name:

Rw 66 dB
C -3 dB
Ctr -10 dB

System description

Panel 1	1 x 100 mm Concrete Block
Frame	Timber stud + Resilient rail/bar (50 mm x 45 mm), Stud spacing 600 mm , Cavity Width 62 mm + 60 mm Fibreglass (10kg/m3) 60mm
Panel 2	1 x 15 mm Gyproc SoundBloc 15mm
Details	Panel Size 2.7 m x 4.0 m, Partition surface mass = 201 kg/m², Mass-air-mass resonant frequency = 60 Hz

freq.(Hz)	R(dB)	Roct (dB)
50	37	
63	32	33
80	31	
100	37	
125	45	41
160	50	
200	54	
250	55	55
315	58	
400	63	
500	66	65
630	70	
800	74	
1000	75	75
1250	76	
1600	79	
2000	79	79
2500	81	
3150	86	
4000	91	89
5000	96	



- Key No. 2594 | Initials:info | File Name:insul

Appendix D - Report Author Details

This report has been produced by Neil Martin, BSc (Hons), PGDip, CEnvH MCIEH, MIOA.

Neil is the principal acoustic consultant at Martin Environmental Solutions Ltd, a consultancy company specialising in Environmental Health disciplines including environmental noise assessment and control. He holds a Bachler's degree in Environmental Health and Diploma in Acoustics. He is a Chartered Member of the Chartered Institute of Environmental Health and a Full member of the Institute of Acoustics.

Neil has over 20year's experience working within a Local Authority Environmental Health setting, principally in the Environmental Protection and Public Health areas and has been working as an acoustic consultant since 2011.

Since its formation, Martin Environmental Solutions has advised and assisted many groups including residents, developers and local authorities about the problems of noise and vibration in the environment and the possible solutions. Neil also acts as an expert witness in the area of acoustics.