



Acoustic Survey and Assessment for Proposed conversation from Wine Bar to Shisha Cafe 7-11 Oldham Road, Rochdale, OL16 1UA.

Prepared for:

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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 from a wine bar to Shisha Café at 7-11 Oldham Road, Rochdale, OL16 1UA.

Site Location and Context

- 1.2. The development site is situated to the east of Oldham Road, and overlooks the busy Drake Street. The property forms part of a terrace row with commercial units to the ground floors and office, storage, and accommodation to the first. The room adjacent to the neighbouring property to the south is a store room. To the east is a rear yard area and a disused two storey commercial building.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. Concerns over ventilation of the proposed café have been raised and as such it is now proposed to fit an extraction unit to the site to draw out air from the building. This noise assessment has been undertaken to determine what if any impact will be experienced by neighbouring properties as a result of the extraction equipment.



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. 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

- 3.1 The proposed development will see the conversion of the site from a wine bar to shisha café, while it is anticipated that background recorded music will be played at the venue this is not consider to be substantially different to the current permitted development. What will be different is the inclusion of an extraction system to ensure internal atmosphere is suitable and any “smoke” is removed from the building.
- 3.2 The extraction system will run across the site drawing air from a number of extraction points within the public area. These will combine and exit the building via a flue to located to the central rear of the building. A suitable fan system will be chosen for this.
- 3.3 In order to obtain representative background sound levels for the rear extract area, on site monitoring was undertaken over the 22nd-23rd August 2023. The rear area being subject to a number of existing refrigeration and extraction systems serving the ground floor properties.
- 3.4 The sound level meter a Cirrus Optimus Green CR:171C units was placed at the top of the access stairwell, away from any reflections.
- 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, warm with no wind, particularly within the rear area surrounded by buildings.
- 3.7 The full results are shown in Appendix A, with a summary in the tables below.

Start Time	End Time	Duration	LAeq	LA90	LAMax
22/08/2023 19:00	22/08/2023 23:00	03:59:59	76.1	75.5	87.8
22/08/2023 23:00	23/08/2023 07:00	08:00:00	70.2	46.5	98.4
23/08/2023 07:00	23/08/2023 19:00	12:00:00	74.4	49.2	86.9

- 3.8 Background sound levels to the rear of the site were dominated by existing plant noise, which was very loud. Even during the night-time period and early morning when the commercial units were closed the graph in Appendix A indicates a high background sound level still dominated by cyclic on-off of refrigeration plant.
- 3.9 The nearest (potential) residential properties are those to either side of the venue, a distance of at least 12m from the extraction point and with the intervening structures



of the rear annexes to the building. It should also be noted that existing additional extraction systems are located to the southern neighbouring property and to the far side of the northern one.

- 3.10 The sound levels produced would also be substantial quieter than the existing plant within the court at 59dB(A) at 1.5m as opposed to the existing plant at ~74dB(A).
- 3.11 There are also existing extraction systems at the adjacent properties nearer to the noise sensitive properties.
- 3.12 The proposed extraction system is based around a Flaktwood JM Aerofoil Axial Fan, 45JM/16/4/5/30, manufacturers sound level data has been obtained and is presented in Appendix B. The proposed system will include a series of air extraction points across the internal customer area which will combine and flow through a single external extraction point. The fan will be located within the rear 'courtyard' area with the existing plant and final termination will be 1m above the eaves.
- 3.13 Given the above information the sound level at the nearest noise sensitive receptor, ignoring any barrier attenuation from the buildings would be 41dB(A), given a 15dB attenuation¹ for an open window the sound levels to be experienced internally would be 26dB(A).
- 3.14 In terms of a BS4142: 2014 assessment the proposed fan does not have any tonal components, will be on continuously and will not be otherwise distinctive against the existing background sound level. No corrections are therefore required.
- 3.15 The sound levels from the extraction system will be below the measured L_{A90} on site and levels previously obtained by Martin Environmental Solutions for other projects in the immediate area.
- 3.16 The inclusion of a CD 450-1D silencer will also reduce the sound levels further to 32.7dB(A) at the nearest receptor, 17.7dBA() internally.

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



4 Conclusion

- 4.1 In order to ensure a suitable internal environment for the development an extraction system is proposed which will terminate to the rear of the site just above the eaves level of the building.
- 4.2 Sound monitoring has identified high sound levels at this point and the chosen extraction system emits lower noise levels than the existing plant.
- 4.3 Two rear annexes from the building will also provide additional attenuation from any sound emissions to the nearest noise sensitive receptors, 2m away.
- 4.4 Resulting sound levels from the extraction system will not therefore result in any adverse impact on the surrounding receptor locations. In addition a silencer has been identified to reduce the impact further.
- 4.5 The inclusion of the above silencer will ensure that the sound levels at the receptor locations are acceptable and will result in a No Observe Effect on the future residents in line with the Noise Policy Statement for England, while providing a suitable internal environment at the development site.
- 4.6 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)
22/08/2023 19:00	76.3	85.2	75.5
22/08/2023 20:00	76.1	87.8	75.4
22/08/2023 21:00	76.0	77.9	75.4
22/08/2023 22:00	76.1	83.9	75.5
22/08/2023 23:00	76.3	89.0	75.7
23/08/2023 00:00	74.4	98.4	61.8
23/08/2023 01:00	65.1	71.6	61.5
23/08/2023 02:00	64.8	84.4	46.6
23/08/2023 03:00	61.9	71.2	35.3
23/08/2023 04:00	60.9	70.5	46.4
23/08/2023 05:00	64.0	71.4	46.6
23/08/2023 06:00	62.7	84.8	47.1
23/08/2023 07:00	62.2	71.5	47.9
23/08/2023 08:00	61.6	78.0	48.4
23/08/2023 09:00	61.3	70.5	47.6
23/08/2023 10:00	73.5	84.0	61.7
23/08/2023 11:00	75.8	77.8	75.2
23/08/2023 12:00	75.9	78.5	75.2
23/08/2023 13:00	75.7	78.1	75.0
23/08/2023 14:00	76.0	77.9	75.3
23/08/2023 15:00	76.0	77.8	75.3
23/08/2023 16:00	75.9	80.8	75.2
23/08/2023 17:00	75.8	83.1	75.0
23/08/2023 18:00	75.6	87.0	75.0



Appendix B – Manufacturers Sound Data.

Technical Details

Fan Code	45JM/16/4/5/30
Fan Diameter / Size	450 Size / mm
Blades	5
Fan Speed	1420 rpm
Velocity	7.6 m/s
Blade Angle	30°
Installation Type / Form of Running	D / B
Fan Casing	Long
Requested Duty	1.2m³/s @ 135 Pa (static)
Outlet Dynamic Pressure	35 Pa
Duty Shaft Power	0.322 kW
Max Shaft Power	0.331 kW
Total Efficiency	64.1 %
Pitch Angle Range	24° - 30°
Motor Frame	BT9 (Sized at 1.2kg/m³ Air Density)
Motor Grade	IE1
Motor Rating	0.320 kW
Full Load Current	2.2 A
Starting Current	5 A
Motor Mounting	Pad
Electrical Supply	220-240 Volts 50 Hz 1 Phase
Start Type	DOL
Motor Winding	Standard
Enclosure	Standard All
ErP [FMEG] Rating	N 51 (ErP Compliant 2013)
ErP [FMEG] Target	N 50
Measurement Category	D
Efficiency Category	Total
Fan + Motor Efficiency	43.0% (1.5 m³/s @ 132 Pa)
Motor Input Power (ErP)	0.463 kW
SFP value	0.41 W/(l/s)
Energy Consumption	999 kWh (2000 h/year)
Running Cost / Year	£90
Air Density	1.2 kg/m³ / 20 °C / 0 m / 50% RH
Smoke Venting	Non Smoke Venting
Product Number	EJ461466

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	75	74	70	68	64	63	59	55	79	50
Outlet*	76	74	70	68	64	63	60	56	79	50
Breakout*	66	56	48	45	39	35	38	32	67	28

* Lw dB re 10⁻¹² W ** dBA re 2x10⁻⁵ Pa

Performance data has been derived from tests carried out in a Flakt Woods laboratory, in accordance with ISO 5801 and is specifically applicable for Ducted installations. When an electronic controller is incorporated, enhanced motor noise can occur - particularly when the operating speed is well below maximum. FWL therefore recommend using an auto transformer speed controller for noise sensitive applications.

SILENCER

Dynamic Insertion Loss & Pressure Graphs

Dynamic Insertion Loss

Fan Size	Silencer Length	Silencer Type	Insertion Loss @ Octave Band (Hz)							
			63	125	250	500	1k	2k	4k	8k
0250	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-14	-16	-11	-10
	2D	ENP	-4	-7	-10	-15	-19	-16	-12	-9
		EP	-7	-10	-15	-16	-15	-17	-13	-13
0315-0560	1D	ENP	-2	-5	-6	-9	-13	-11	-6	-6
		EP	-4	-6	-8	-11	-18	-19	-17	-14
	2D	ENP	-4	-8	-12	-17	-23	-17	-12	-10
		EP	-7	-10	-12	-21	-26	-26	-24	-22
0630-0800	1D	ENP	-3	-4	-9	-15	-15	-8	-7	-6
		EP	-4	-6	-8	-17	-23	-20	-18	-10
	2D	ENP	-6	-8	-13	-22	-22	-13	-12	-9
		EP	-8	-11	-16	-27	-32	-31	-29	-19
900-1000	1D	ENP	-3	-4	-9	-14	-13	-7	-7	-6
		EP	-4	-6	-11	-20	-18	-15	-13	-11
	2D	ENP	-6	-8	-13	-21	-18	-12	-11	-9
		EP	-8	-11	-18	-26	-27	-26	-22	-16

Resulting sound level at nearby receptor will silencer.

	63	125	250	500	1000	2000	4000	8000	Lw	Lp@3m	Lp@12m
45JM/16/4/5/30	76	74	70	68	64	63	60	56	79	61	49.4
silencer - CDA 450 1D	2	5	6	9	13	11	6	6			
a-weighting	-26.2	-16.1	-8.6	-3.2	0	1.2	1	-1.1			
resulting sound level	47.8	52.9	55.4	55.8	51	53.2	55	48.9	62.3	45	32.7