



Acoustic Survey and Assessment for Proposed Hot Food Takeaway at The Village Chippy, 37 Bloom Street, Manchester, M1 3LY.

Prepared for:

The Village Chippy Manchester Ltd
37 Bloom Street
Manchester
M1 3LY.

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1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic assessment to support a planning application for the change of use of 37 Bloom Street, Manchester, M1 3LY, into a hot-food takeaway (Fish and Chip shop).

Site Location and Context

- 1.2. The development site is a mid-terrace two storey property with additional basement level situated in the centre of Manchester. The proposed development is located on the ground floor. Additional commercial properties are located above and below the site and along the full terrae block. To the west is an open-air car park and the east a mixture of residential and commercial uses including a nightclub. A new residential block was at the time under construction immediately behind the site.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. Concerns have been raised over the potential impact from noise associated with the extraction system to be fitted as part of the development and its impact on existing and future residential receptors.



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 February 2019, 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. In addition, the published '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.
- 2.16. 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 Lancashire guidance, WHO and BS 8233: 2014.

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 On-site monitoring was undertaken over the 8th-9th July 2021. At the time the country was still experiencing lock down as part of the Covid 19 pandemic. As such the surrounding area which usually has a very busy night life was much quieter than normal and no night club or music venues were open.
- 3.2 The businesses along Bloom Street were open and trading and this included the proposed hot-food take-away. To the rear of the site there are several extraction systems, air handling units and condensers serving the many businesses along the Street, which consist of restaurants, take-ways, convenience stores.
- 3.3 It is also noted that the new block of flats being constructed at the time will provide a substantial barrier to any other residential dwellings to the far side of the rear access road. A review of the planning application for these flats identifies that an enhanced glazing system is required in the form of a triple glazing unit of 10mm/8mm/6mm/200mm/6mm to meet the required internal sound levels. This glazing specification will provide a sound reduction of 50dB R_w.
- 3.4 Monitoring was undertaken by leaving a sound level meter approx. 1m from the first-floor rear window. This position was also approx. 1m from the extraction system. The meter a Cirrus Optimus Green CR:171B sound level meter was field calibrated before and after the measurement period with no significant deviation, see Appendix B for calibration details. Factory calibration certificates are available on request.
- 3.5 The full results are available in Appendix A.
- 3.6 The monitoring has identified the sound levels with the development extraction system switched on and operating as normal throughout. Other mechanical units in the area were also operating.
- 3.7 The fish and chip shop was operating until 23:00 on the day of the monitoring and a review of the audio measurements and the sound levels identifies a significant drop in sound levels at 22:45 from 69.9dB(A) to 58dB(A).
- 3.8 Assuming this sound level 69.9dB(A) for the chippy extraction system.
- 3.9 The extract location is 3m from the façade of the new property to the rear, resulting in a façade sound level of 60.4dB(A). The proposed glazing to the building will reduce



this further to 29.8dB(A), see Appendix C. This considers a simple deduction of the glazing specifications to each frequency and not the overall building element (more rigorous BS8233 calculation) which would show a lower level.

- 3.10 The above suggests that the extraction system will not result in any adverse impact on the adjacent residential property.
- 3.11 It is however normal procedure to undertake a BS4142:2014 assessment for extraction equipment which as described in section 2 above considers the sound levels externally.
- 3.12 A BS4142:2014 assessment has been undertaken, concentrating on the night-time period. This is shown below. No tonal, impulsive, or intermittent elements exist to the system, and it is not dissimilar to other extraction and plant noise in the area.

	Night-time	Night-time with silencer	
Measured Ambient sound level	$L_{Aeq} = 69.9\text{dB}$ Distance corrected	-	Measured on site
Residual Sound level	$L_{Aeq} = 57.1\text{dB}$	$L_{Aeq} = 57.1\text{dB}$	Measured at 03:30
Background Sound Level	$L_{A90} = 56.3\text{dB}$	$L_{A90} = 56.3\text{dB}$	Measured at 03:30
Reference period	15 minutes	15 minutes	Normal night-time ref period,
Specific sound Level	$L_{Aeq} = 60.0\text{dB}$	$L_{Aeq} = 51.7\text{dB}$	Distance calculated to the façade.
Acoustic feature	-	-	No correction applied
Rating level	60.0dB	51.7dB	
Background sound level	$L_{A90} = 56.3\text{dB}$		
Excess of Rating level over background level	(60.0-56.3) dB = +3.7dB indicates adverse impact	(51.7-56.3) dB = - 4.6dB	



		indicates no significant adverse impact	
Uncertainty	Monitoring was undertaken during Covid 19 restrictions, late night entertainment was largely closed at the time as such background sound levels are likely to be higher.		

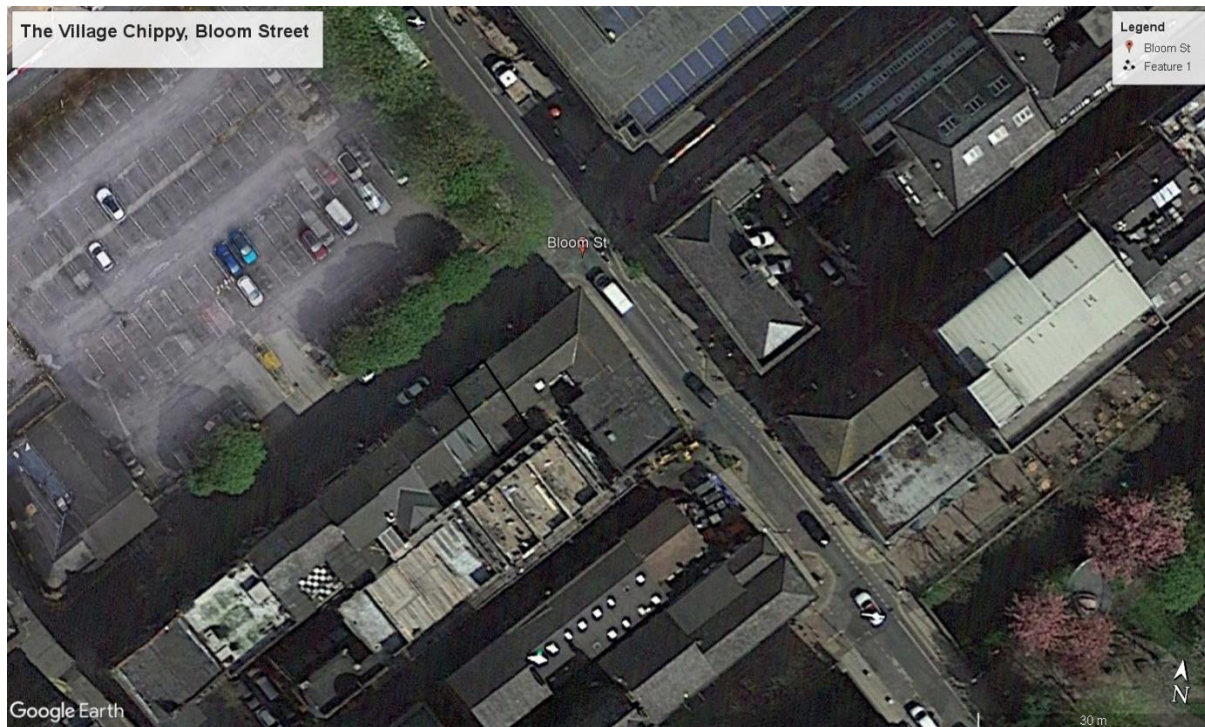
- 3.13 The BS4142:2014 identifies a significant adverse impact based on the monitoring data. As mentioned, this does not take account of the mitigation measures already designed into the residential development to the rear of the site.
- 3.14 Given this potential adverse impact it is recommended that further mitigation measures are included into the design of the extraction system, in the form of a silencer.
- 3.15 A Flaktwood BDER-60-020-120 silencer will reduce the sound level at the façade to 51.7dB(A), below the prevailing background sound level by 4.6dB(A), therefore the BS4142 assessment indicates that the extraction system would not result in an adverse impact.



4 Conclusion

- 4.1 On-site monitoring has identified existing background sound levels along with current sound levels from the extraction system.
- 4.2 Based on the approved plans and mitigation measures for the adjacent new residential units to the rear the extraction system will not result in any adverse impact on the future residents in line with the standards identified by the World Health Organisation and BS8233:2014.
- 4.3 In addition to the above calculations a BS4142:2014 assessment has been undertaken. This identified a potential adverse impact from the extraction system, it is therefore recommended that an additional silencer be fitted to the flue to reduce the sound levels. This will result in sound levels below the prevailing night-time background without the extraction system operating.
- 4.4 The inclusion of the above mitigation measures to all habitable rooms will ensure that the internal and external 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	Duration	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
07/07/2021 19:00	01:00:00	70.3	74.9	69.8
07/07/2021 20:00	01:00:00	70.1	74.4	69.6
07/07/2021 21:00	01:00:00	70.2	91.6	69.7
07/07/2021 22:00	01:00:00	68.5	78.0	57.0
07/07/2021 23:00	01:00:00	58.3	75.4	56.6
08/07/2021 00:00	01:00:00	57.6	75.7	56.4
08/07/2021 01:00	01:00:00	57.5	79.0	56.2
08/07/2021 02:00	01:00:00	57.7	74.7	56.4
08/07/2021 03:00	01:00:00	57.4	72.5	56.3
08/07/2021 04:00	01:00:00	56.5	73.9	55.5
08/07/2021 05:00	01:00:00	50.5	68.0	48.8
08/07/2021 06:00	01:00:00	53.0	71.7	49.2
08/07/2021 07:00	01:00:00	68.8	94.3	50.9
08/07/2021 08:00	01:00:00	63.7	85.9	53.0



Appendix B – Calibration and Sound Level Meter Details

Type	Value
Instrument	G066429, CR:171B
Time History Rate	1 second
Audio Quality	16 bit, 16 kHz
Last Factory Calibration	27/04/2021
Time	07/07/2021 18:34
Level	93.7 dB
Offset	-0.06 dB
Time	08/07/2021 09:35
Level	93.7 dB
Offset	-0.22 dB



Appendix C – Break-in Calculations

		63	125	250	500	1000	2000	4000	8000	Lp
Source		67	70.3	71.9	67.1	62.6	62.8	58.5	51.8	
distance		-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	
Glazing		31	34	48	48	54	62	67	67	
		26.5	26.8	14.4	9.6	-0.9	-8.7	-18	-24.7	29.8

		63	125	250	500	1000	2000	4000	8000	Lp
Source		67	70.3	71.9	67.1	62.6	62.8	58.5	51.8	
distance		-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	-9.5	
Silencer		11	11	25	31	36	48	33	23	
Façade		46.5	49.8	37.4	26.6	17.1	5.3	16	19.3	51.7
Glazing		31	34	48	48	54	62	67	67	
Internal		15.5	15.8	-10.6	-21.4	-36.9	-56.7	-51	-47.7	18.7