



Acoustic Survey and Assessment for proposed change of use from public house to convenience store and residential apartments at Shakespeare Hotel, Wytham Street, Padiham, B12 7DX.

Prepared for

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Contents

1. Introduction	3
Site Location and Context	3
2. Policy and Guidance.....	4
3. The Assessment	8
Impact on proposed Residential units	8
Impact from Proposed Convenience Store.....	9
4 Conclusion.....	11
Figure 1 – Aerial Photograph	12
Appendix A – Full Monitoring Results.....	13
Appendix B – Report Author Details	16



1. Introduction

- 1.1. Martin Environmental Solutions has been commissioned to undertake an acoustic survey and assessment to support a planning application for a proposed change of use from public house to convenience store, barbers and four first floor apartments at Shakespeare Hotel, Wytham Street, Padiham, B12 7DX.

Site Location and Context

- 1.2. The site currently consists of the former public house with beer garden to the rear (west) small asphalt parking area to the front (east). The building is a two-story cavity brick-built structure with tiled roof. To the immediate north of the site is a water course, with housing beyond. To the west a housing development is being built and housing also lies to the east on the far side of the road.
- 1.3. An aerial Photograph is enclosed in Figure 1.
- 1.4. The local planning authority have requested a Noise Impact assessment be undertaken for the proposed development hence the request for this report.



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

Impact on proposed Residential units

- 3.1 In order to obtain representative background sound levels for the area on site monitoring was undertaken over the 14th-16th December 2023.
- 3.2 The sound level meter, a Cirrus Optimus Green unit was placed to the eastern façade overlooking the road. The meter was placed ~1m from the façade out of a first-floor window.
- 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 of the first day.
- 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}
14/12/2023 11:01	14/12/2023 23:00	11:58:13	65.5	47.9	92.2
14/12/2023 23:00	15/12/2023 07:00	08:00:00	49.2	46.4	77.1
15/12/2023 07:00	15/12/2023 23:00	16:00:00	61.7	47.6	94.7
15/12/2023 23:00	16/12/2023 07:00	08:00:00	50.6	45.7	94.9
16/12/2023 07:00	16/12/2023 07:09	00:09:09	49.8	46.9	66.7

- 3.6 Background sound levels were dominated by passing traffic and the adjacent building works for the site to the rear, with periods of delivery vehicles idling at the front of the site raising the background sound level. At night the river to the north could be clearly heard.
- 3.7 At night the maximum sound levels regularly exceeded at were due to the passing traffic with levels being 69.2dB(A) not regularly exceeded.
- 3.8 Given a 15dB attenuation¹ for an open window the sound levels to be experienced by the future occupants are slightly above those identified within the guidance documents detailed in section 2 of the report. Therefore, further mitigation measures are required.

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



- 3.9 A standard 6/12/6 double glazing unit will provide a sound reduction, $R_w(C;C_{tr})$, of 33(-1;-3). Therefore, adequate to protect the future occupants of the front barn from the existing sound levels.
- 3.10 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.
- 3.11 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.

Impact from Proposed Convenience Store

- 3.12 The proposed plant for the convenience store is currently unknown although it has been assumed that external refrigeration plant will be included within the development.
- 3.13 A review of the planning application for the housing estate to the rear has identified a requirement for double glazed windows and trickle ventilation but only to a level of 15dB attenuation equivalent to an open window.
- 3.14 The nearest windows to the new development will be located 20m from the rear of the proposed convenience store, with garden areas to the rear of the development.
- 3.15 Based on the night-time average background sound level of 41.2dB $L_{A90,15min}$, as the daytime figures were influenced by the construction activity a combined sound emission for the proposed plant can be identified.
- 3.16 In accordance with BS4142:2014 a 3dB penalty can be applied for intermittency (although not reduction for 'operational on-time' has been), modern plant refrigeration



plant is not tonal or impulsive. In effect bring the background sound level down to 38.2dB(A).

- 3.17 A typical refrigeration plant (J&E Hall) has been identified with sound levels of 39-44dB(A) at 10m or 33-38dB(A) at 20m. Thus, below the prevailing background sound level.
- 3.18 Combined sound levels from any external plant should therefore be below 44dB(A) (at 10m) and once identified the exact sound level at the nearby property can be calculated.
- 3.19 For the proposed apartments on the first floor the above sound level would result in a façade level of 53dB(A), through the closed windows an internal sound level of 23dB(A).



4 Conclusion

- 4.1 On-site monitoring has identified existing background sound levels will result in an adverse impact on those proposed residential apartments. 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 In addition, a combined sound level for any external plant has been identified at 44dB(A) at 10m to avoid any adverse impact on either the new development to the rear of the site or the first-floor apartments. Exact calculations may offer a slight exceedance of the above once the final design and location are known.
- 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



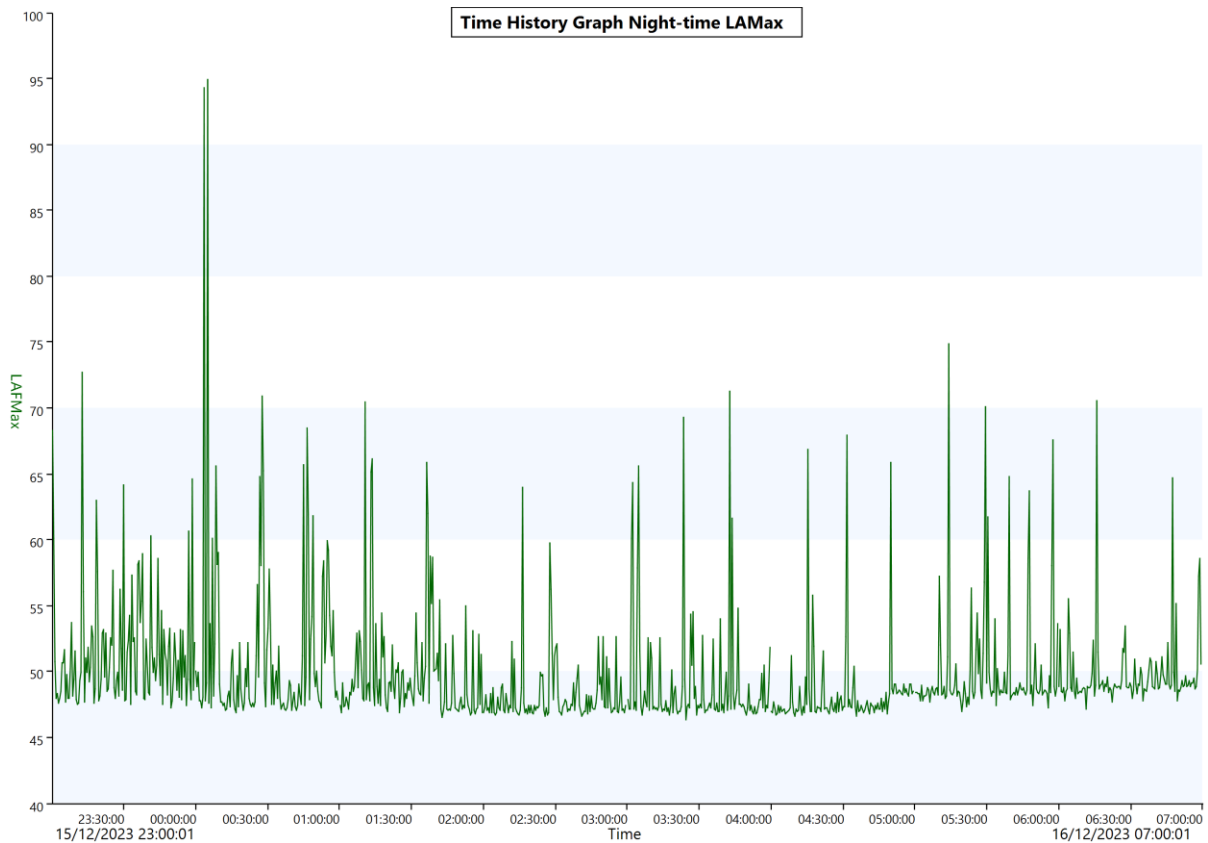
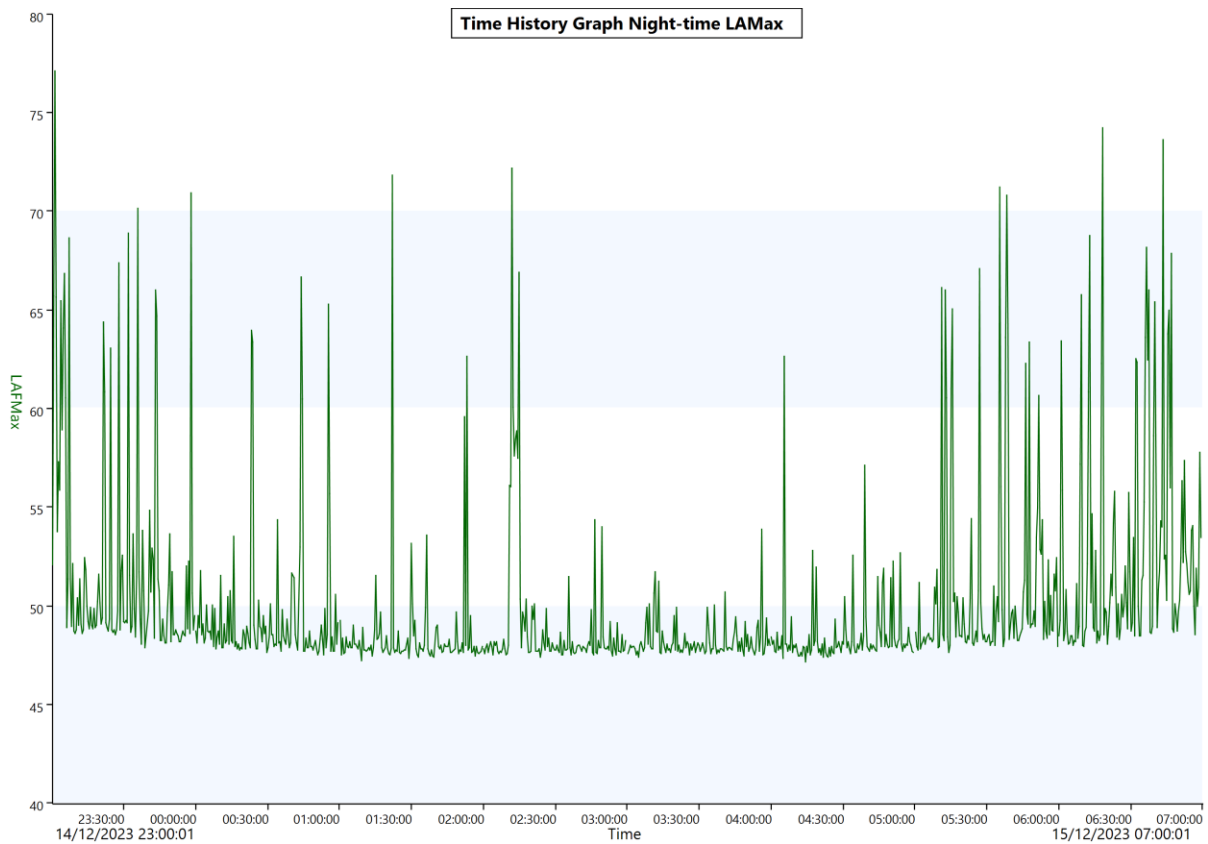


Appendix A – Full Monitoring Results

Time	L _{Aeq} (dB)	L _{AMax} (dB)	L _{A90} (dB)
14/12/2023 11:01	57.4	80.9	51.7
14/12/2023 12:00	59.7	84.5	52.3
14/12/2023 13:00	75.7	92.2	52.6
14/12/2023 14:00	60.8	85.4	50.5
14/12/2023 15:00	60.1	81.0	52.6
14/12/2023 16:00	57.2	75.4	49.8
14/12/2023 17:00	55.5	72.8	49.0
14/12/2023 18:00	56.6	84.1	48.9
14/12/2023 19:00	54.2	71.2	48.3
14/12/2023 20:00	53.1	72.5	47.5
14/12/2023 21:00	53.3	76.8	47.4
14/12/2023 22:00	50.9	74.0	47.4
14/12/2023 23:00	51.5	77.1	47.0
15/12/2023 00:00	47.9	66.6	46.4
15/12/2023 01:00	47.7	71.8	46.1
15/12/2023 02:00	47.8	72.2	46.2
15/12/2023 03:00	46.8	53.9	46.2
15/12/2023 04:00	46.9	62.6	46.2
15/12/2023 05:00	50.2	71.2	46.7
15/12/2023 06:00	51.4	74.2	47.0
15/12/2023 07:00	59.5	85.9	48.0
15/12/2023 08:00	63.9	86.0	51.3
15/12/2023 09:00	61.4	88.2	51.0
15/12/2023 10:00	63.1	91.9	51.3
15/12/2023 11:00	60.4	85.2	51.2
15/12/2023 12:00	59.2	88.7	50.9
15/12/2023 13:00	60.4	85.9	50.1
15/12/2023 14:00	56.9	75.3	50.4
15/12/2023 15:00	63.6	85.6	50.9
15/12/2023 16:00	62.4	94.7	50.1
15/12/2023 17:00	69.1	89.6	50.0
15/12/2023 18:00	54.7	73.4	48.8
15/12/2023 19:00	53.0	74.7	47.6
15/12/2023 20:00	53.5	73.0	47.0
15/12/2023 21:00	52.8	71.5	46.5
15/12/2023 22:00	51.6	73.1	46.3
15/12/2023 23:00	49.5	72.7	46.0
16/12/2023 00:00	56.5	94.9	45.7
16/12/2023 01:00	48.5	70.4	45.5
16/12/2023 02:00	46.6	64.0	45.4
16/12/2023 03:00	48.1	71.3	45.4



16/12/2023 04:00	47.3	67.9	45.4
16/12/2023 05:00	49.5	74.8	45.9
16/12/2023 06:00	47.9	70.5	46.3
16/12/2023 07:00	49.8	66.7	46.9





Appendix B – 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 Bachelor'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 20-years 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.