JPM ACOUSTICS

11 LORD STREET, WREXHAM

NOISE IMPACT ASSESSMENT

MARCH 2025

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Author	Adam Barr		
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REGISTERED ADDRESS
JPM Acoustics Ltd
97 Hazelhurst Road
Worsley
Manchester
M28 2SW

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CONTENTS

1.0. INTRODUCTION 5
1.1. OVERVIEW 5
1.2. SITE LOCATION AND PROPOSED DEVELOPMENT 5
2.0. STANDARDS AND GUIDANCE 7
2.1. BS 4142:2014+A1:2019: METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND (BS 4142) 7
3.0. BASELINE NOISE SURVEY 8
3.2. EQUIPMENT 8
3.3. WEATHER CONDITIONS 9
3.4. RESULTS 9
4.0. ASSESSMENT 10
5.0. CONCLUSION 12

APPENDICES

APPENDIX A: GLOSSARY

1.0. INTRODUCTION

1.1. OVERVIEW

1.1.1. JPM Acoustics Ltd has been appointed to undertake a Noise Impact Assessment to support a planning application for a proposed residential development at 11 Lord Street in Wrexham.

1.1.2. This report considers the potential for the existing noise environment on the site to impact the proposed residential dwellings. The assessment has been undertaken with due regard to relevant planning policies, British Standards, and technical guidance documents relating to noise.

1.1.3. This report is necessarily technical in nature. Therefore, to assist the reader, a glossary of acoustic terminology is provided in **Appendix A**.

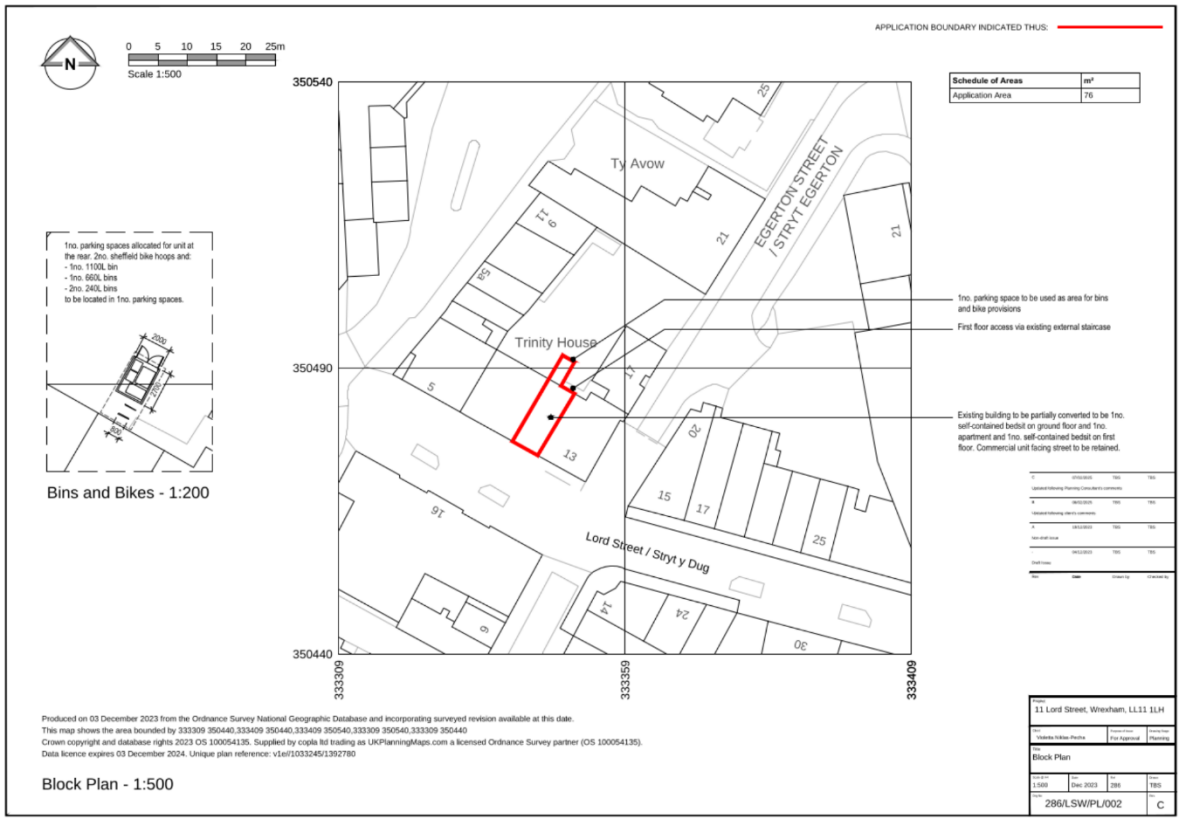
1.2. SITE LOCATION AND PROPOSED DEVELOPMENT

1.2.1. The proposed residential development is to comprise three residential apartments and a shop, within the existing building at 11 Lord Street in Wrexham.

1.2.2. The site is bounded by Lord Street to the south and existing buildings to the east and west with retail use at ground floor level. To the north is a small courtyard used as a car park.

1.2.3. **Figure 1.1** shows the site location.

Figure 1.1: Site location plan



2.0. STANDARDS AND GUIDANCE

2.1. BS 8233:2014: GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS (BS 8233)

2.1.1. BS 8233 provides guidance for the control of noise in and around buildings and recommends internal and external noise level criteria for residential dwellings. The British Standard states that it is desirable that internal ambient noise levels do not exceed the guideline values in **Table 2.1**.

Table 2.1: Internal desirable guideline values from BS 8233

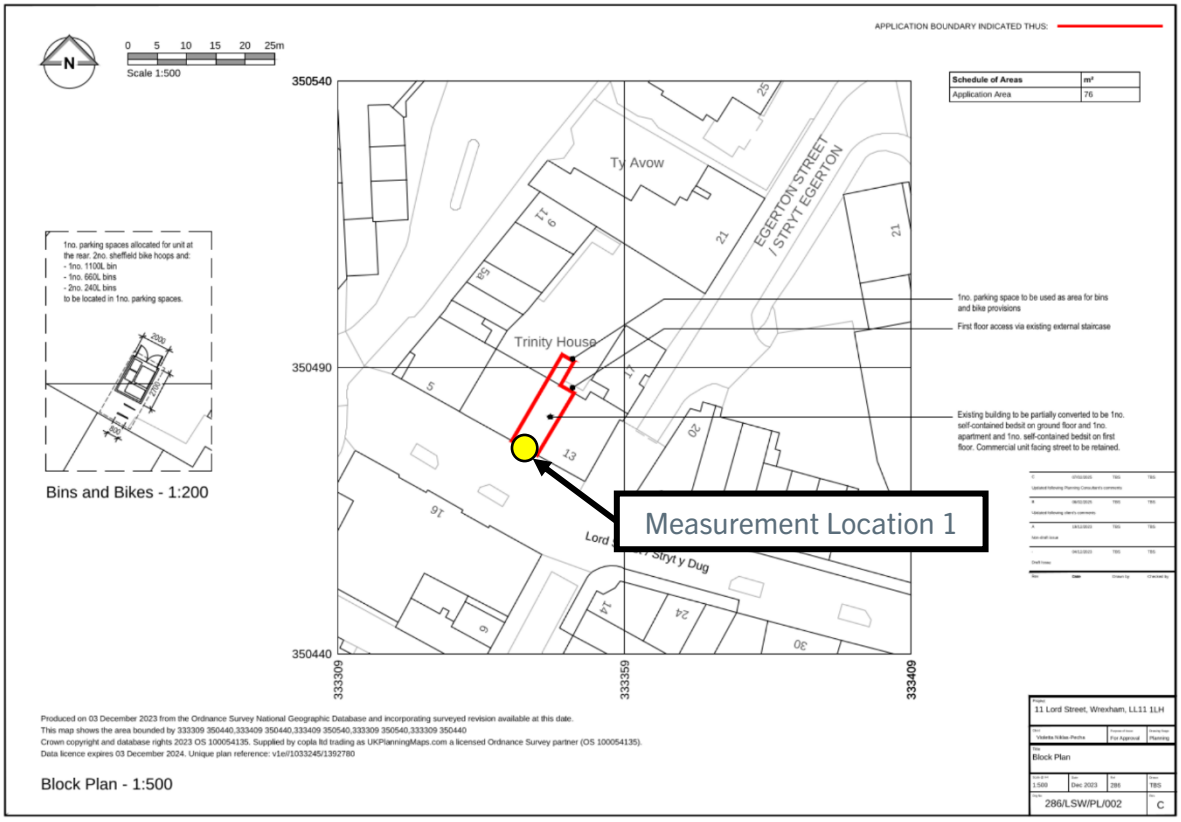
Activity	Location	Period	
		07:00 to 23:00 (Daytime)	23:00 to 07:00 (Night-Time)
Resting	Living Room	35 dB $L_{Aeq, 16h}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq, 16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16h}$	30 B $L_{Aeq, 8h}$

2.1.2. BS 8233 does not provide specific criteria for one-off noise events (L_{AFmax}), however, it is common practice to adopt 45 dB L_{AFmax} as a criterion for typical events at night, based on the guidance from the World Health Organisation (WHO) *Guidelines for Community Noise* 1999 and *Environmental Noise Guidelines for the European Region* 2018. Therefore, this criterion has been adopted for this assessment.

3.0. BASELINE NOISE SURVEY

3.1.1. A baseline noise survey has been undertaken to determine the prevailing noise climate on the site. **Figure 3.1** shows the measurement location adopted during the survey.

Figure 3.1: Baseline noise survey measurement location



3.1.2. Unattended measurements were undertaken at Measurement Location 1 (ML1) from 16:45 on 10th March until 16:00 on 11th March 2025. The purpose of the measurements was to establish the prevailing noise climate on the site. The microphone was fixed to a pole protruding 1 m from a first-floor window in façade conditions.

3.2. EQUIPMENT

3.2.1. The noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3.1**. The measurement equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed.

3.2.2. The sound level meter, pre-amplifier and microphone were calibrated to traceable standards within 24 months prior to the measurements. The portable calibrator was calibrated within 12 months prior to the measurements.

Table 3.1: Equipment details

Equipment	Make and Model	Serial Number	Calibration due Date
Sound Level Meter	Svantek 971	60745	06/09/2025
Microphone	AcoPacific 7052E	66815	
Preamplifier	Svantek SV18	64535	
Calibrator	01dB-Stell Cal 21	34675335	27/11/2025

3.3. WEATHER CONDITIONS

3.3.1. Weather conditions during the survey were generally conducive to environmental noise monitoring, it being dry with low wind speeds (<5 ms^{-1}).

3.4. RESULTS

3.4.1. A summary of the measured noise levels at ML1 during the survey is presented in **Table 3.2**. The free-field noise levels in **Table 3.2** have been derived from the measured façade noise levels by applying a -3 dB correction.

Table 3.2: Summary of measured sound pressure levels, free-field

Date and Start time	Period	Duration	Sound Pressure Levels		
			dB $L_{Aeq,T}$	dB $L_{A90,T}$[1]	dB L_{AFmax}[2]
10/03/2025 16:45	Daytime[3]	16 hours	55	47	-
10/03/2025 23:00	Night-time	8 hours	58	41	72

[1] Taken to be the mean of measured $L_{A90,15min}$ values during relevant periods.
[2] 90th percentile of measured $L_{AFmax,15min}$ periods during the night-time.
[3] Includes periods between 16:45 and 23:00 on 10th March and between 07:00 and 16:00 on 11th March 2025.

4.0. ASSESSMENT

4.1.1. In accordance with guidance from BS 8233, internal noise levels in dwellings can be estimated from external free-field noise levels by applying a -15 dB correction, assuming the façade contains a partially open window for ventilation or cooling. **Table 4.1** shows the predicted internal noise levels within proposed habitable spaces overlooking Lord Street (i.e. the worst affected elevation) with windows open.

Table 4.1: Predicted internal noise levels with windows open

Date and Start time	Period	Duration	Sound Pressure Levels	
			dB $L_{Aeq,T}$	dB L_{AFmax}
10/03/2025 16:45	Daytime	16 hours	40	-
10/03/2025 23:00	Night-time	8 hours	43	57

4.1.2. It can be seen from **Table 4.1** that the predicted internal noise levels with windows open are above the desirable guideline values from BS 8233, as detailed in **Table 2.1**. As such, consideration has been given to the noise levels that can be achieved with windows closed.

4.1.3. In accordance with Section G.1 of BS 8233, internal noise levels with windows closed can be estimated by subtracting the sound insulation performance of the glazing from the external free-field noise levels. Standard, thermally proficient double glazed window units typically achieve a sound insulation performance of circa 33 dB R_w. **Table 4.2** shows the predicted internal noise levels in habitable spaces overlooking Lord Street (i.e. the worst affected elevation) assuming windows are closed.

Table 4.2: Predicted internal noise levels with windows closed

Date and Start time	Period	Duration	Sound Pressure Levels	
			dB $L_{Aeq,T}$	dB L_{AFmax}
10/03/2025 16:45	Daytime	16 hours	22	-
10/03/2025 23:00	Night-time	8 hours	25	39

4.1.4. It can be seen from **Table 4.2** that the desirable guideline values from BS 8233 are predicted to be achieved consistently with windows closed, assuming standard double glazing is installed. The 45 dB L_{AFmax} night-time criterion from the WHO guidelines is also predicted to be achieved.

4.1.5. It is assumed that whole dwelling ventilation rates (as defined in Approved Document F of the Building Regulations) could be achieved using a continuous mechanical extract ventilation (MEV) system, with passive frame mounted trickle ventilators installed in the building façade (i.e. System 3 from Approved Document F). To ensure that trickle ventilators in the building façade do not undermine the sound insulation performance of the wider façade, it is recommended that all ventilators are selected to achieve a minimum sound insulation performance of 33 dB $D_{n,e,w}$

when in the open position. This is achievable by most proprietary non-acoustic trickle ventilators (Greenwood EAV vent or similar).

4.1.6. Given that the desirable guideline values can be achieved with standard double glazing and trickle ventilators, it is considered that further mitigation measures are unwarranted.

5.0. CONCLUSION

5.1.1. JPM Acoustics Ltd has been appointed to undertake a Noise Impact Assessment to support a planning application for a proposed residential development at 11 Lord Street in Wrexham.

5.1.2. This report considers the potential for the existing noise environment on the site to impact the proposed residential dwellings. The assessment has been undertaken with due regard to relevant planning policies, British Standards, and technical guidance documents relating to noise.

5.1.3. The assessment of noise levels measured on the site indicated that the desirable guideline values from BS 8233 are achievable with standard double glazing and trickle ventilators.

5.1.4. Given the findings of this assessment, it is considered that noise need not be a determining factor in granting planning consent for the proposed development.

APPENDIX A: GLOSSARY

Table A.1: Noise terminology

Terminology	Description
A-weighting, dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' - weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
Decibel, (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 $\log_{10}$ (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20 Pa.
Façade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast Time Weighting (F)	Averaging time constant used in sound level meters and commonly used in the measurement of environmental noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m away.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period, T. L_{10} may be thought of as the "average maximum" noise level. Generally used to describe road traffic noise.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period, T. L_{90} may be thought of as the "average minimum" noise level. Generally used to describe background noise.

Terminology	Description
$L_{eq,T}$	A noise level index called the equivalent continuous noise level over the time period, T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level during the period, T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
Sound Power	The sound energy radiated per unit time by a sound source. Measured in watts (W).
Sound Power Level, L_w	Sound power measured on a decibel scale, relative to a reference value of 10^{-12} W.
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure. Measured in pascals (Pa).
Sound Pressure Level (Sound Level), L_p	The sound level is the sound pressure on a decibel scale, relative to a reference value of $20x10^{-6}$ Pascals.