

Acoustic assessment of proposed bar to nearby residential properties

854 Manchester Road, Castleton, Rochdale



Client: Patsy's Cocktail Bar

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0. SUMMARY

- 0.1. ACA Acoustics Limited have been commissioned to assess the acoustic impact of the proposed conversion of a commercial unit to a new bar at 854 Manchester Road, Castleton, Rochdale.
- 0.2. The assessment is required to provide evidence that noise emissions from the new bar will not be detrimental to the amenity of nearby residents and complies with relevant criteria.
- 0.3. To protect the amenity of residents of nearby habitable properties, ACA Acoustics recommends that noise emissions from the bar should be controlled such that the LAeq does not exceed the measured background sound levels and with low frequencies in the L10 indices not exceeding the corresponding L90 background values, outside the nearby properties.
- 0.4. Nearby residential properties on Manchester Road overlook the front façade of the development site, and properties on Charlton Street overlook the rear of the site.
- 0.5. A background sound level survey has been carried out over a 24-hour period on the 4th – 5th July 2024. Whilst on site the author considered the sound climate primarily consists of traffic activity from nearby routes.
- 0.6. Source sound levels have been measured within various similar venues to establish likely internal levels when trading. Typical sound levels within the bar are anticipated to not exceed LAeq 94dB during a busy weekend evening period, and maximum permissible music levels within the venue have been suggested in this report.
- 0.7. A computer model has been used to calculate operational sound transmission via the shopfront to outside nearby residential properties close to the development site. A scheme of mitigation measures has been designed to ensure noise emissions comply with the recommended criteria. This will provide a good level of amenity to residents of nearby properties and no further noise mitigation is required.
- 0.8. Internal noise transmission through the separating party wall has also been assessed within this report. Calculated sound levels have been compared against suitable NR criteria to consideration of low frequency noise is included within the assessment.
- 0.9. Internal sound transmission through the party walls to adjoining residential properties will not exceed NR 15, with benefit of acoustic linings to the development site, ensuring that the amenity of occupants of these properties will be preserved.

1. INTRODUCTION

ACA Acoustics Limited has been commissioned to carry out an assessment of noise emissions from a proposed conversion of a commercial unit to a bar at 854 Manchester Road, Castleton, Rochdale. The assessment considers operational noise (patrons and music) from the bar to nearby residential properties.

The objective of the assessment is to determine the impact the proposed use would have on nearby residential properties, and where necessary to make recommendation for suitable noise mitigation treatments.

This report presents results of the sound level surveys and assessment. This revision to the report includes assessment of through the structure to an adjoining noise-sensitive property.

2. ACOUSTIC CRITERIA

2.1. Operational Noise Breakout

In March 2003, the Institute of Acoustics (IOA) published a *Good Practice Guide on the Control of Noise from Pubs and Clubs*. The guide is a useful document; however, it does not provide objective noise criteria or measurement procedures for assessment of entertainment noise. To address this, a working group of the IOA has produced a working draft annex on criteria and measurement guidelines which includes suggested numerical criteria for music emissions.

Paragraph A2.3 of the draft annex recommends that for sites where entertainment (music) takes place more than once per week and continues beyond 23:00 hours,

“Criteria applicable for both external and internal assessments at noise-sensitive properties:

- The LAeq of the entertainment noise should not exceed the representative background noise level LA90 (without entertainment noise), and*
- The L10 of the entertainment noise should not exceed the representative background noise level L90 (without entertainment noise) in any 1/3rd octave band between 40Hz and 160Hz.*

If the above criteria are met entertainment noise will be virtually inaudible inside noise-sensitive property.”

2.2. Internal Noise Transmission to Adjoining Noise-Sensitive Properties

The IOA Good Practice Guide is appropriate for assessment of music noise emission to external receptors, however it does not provide guidance for assessment of internal noise transmission. As a result, acoustic criteria has been chosen which will ensure the amenity of the adjoining residents will be protected.

There is no specific British Standard which assesses the impact of amplified music on adjoining receptors and little available guidance. Considering guidance that is available for other similar types of venues, ACA Acoustics consider that to ensure a good standard of amenity in the adjoining residential properties, internal sound levels from the venue within habitable rooms should not exceed NR15. The use of an NR criteria will protect the residents from low frequency noise disturbance.

3. REVIEW OF SITE LOCATION & DEVELOPMENT PROPOSALS

An existing commercial unit is being redeveloped at 854 Manchester Road, Castleton, Rochdale into a new bar. The unit incorporates ground, first, and second (loft) spaces.

The client has advised that amplified music with DJs will be played. There are existing residential properties to the front of the site overlooking Manchester Road, and also to the rear of the site on Charlton Street.

The bar will operate until 23:00 hours.

Drawings provided by the client are shown in Figure 1 below. The venue will incorporate music at all levels, with no music to be played externally.



Figure 1: Proposed ground floor layout

Location of the nearest residential properties and sound level survey position are shown in Figure 2 below.



Figure 2: Development site, survey location, and nearest residential properties

4. SOUND LEVEL SURVEY

4.1. Background Sound Level Survey

To assess the impact of the proposed bar, a background sound level survey has been conducted at the development site to determine ambient sound levels in the vicinity of nearby residential properties.

The sound level survey was carried out over a 24-hour period between the 4th – 5th July 2024. The survey was carried out using two microphones on pole arrangements extended out of first floor windows of the development site to the front and rear of the site. Sound levels will be representative of those experienced at the windows of the nearby residential properties.

The following equipment was used during the survey; the sound level meter was calibrated before the survey and checked after with no deviation noted.

Equipment	Serial Number
NTi Audio Class 1 sound level meter type XL2-TA complete with weatherproof and lockable outdoor environmental kit	A2A-10964-E0
Svantek Class 1 sound level meter type SVAN971A, complete with MOLES weatherproof and lockable outdoor environmental kit	121131
Svantek calibrator type SV33B. Compliant to IEC 60942-1:2003	83826

Table 1: Equipment used during the sound level survey

Weather conditions during the sound level survey were cool and remained dry and calm throughout the survey.

Results of the survey in terms of raw data are shown in Figure 3 and Figure 4 below.

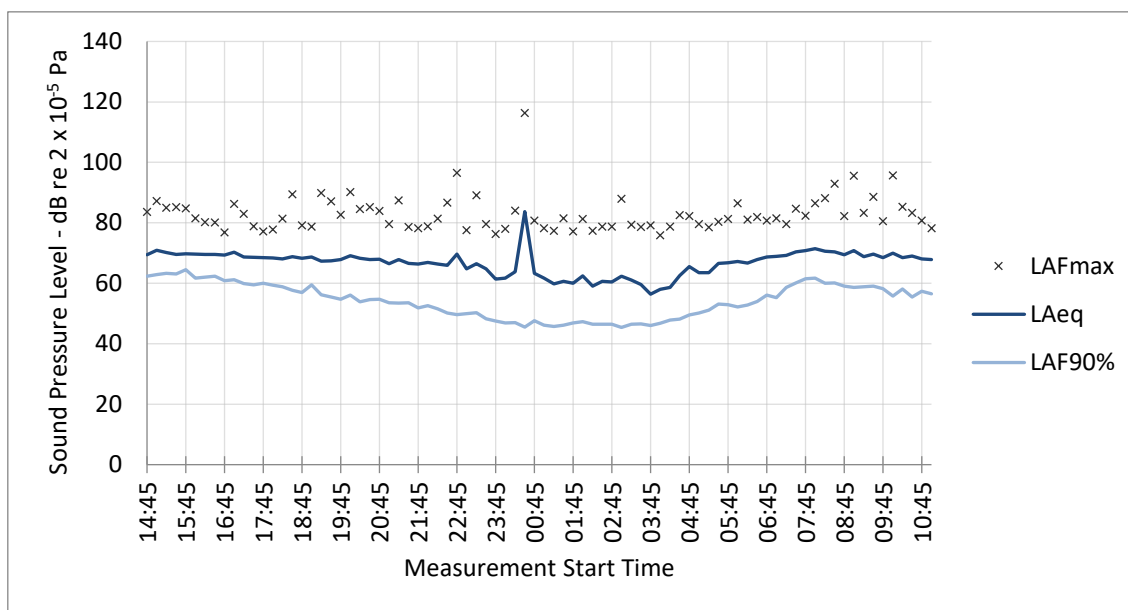


Figure 3: Sound level survey results to the front façade

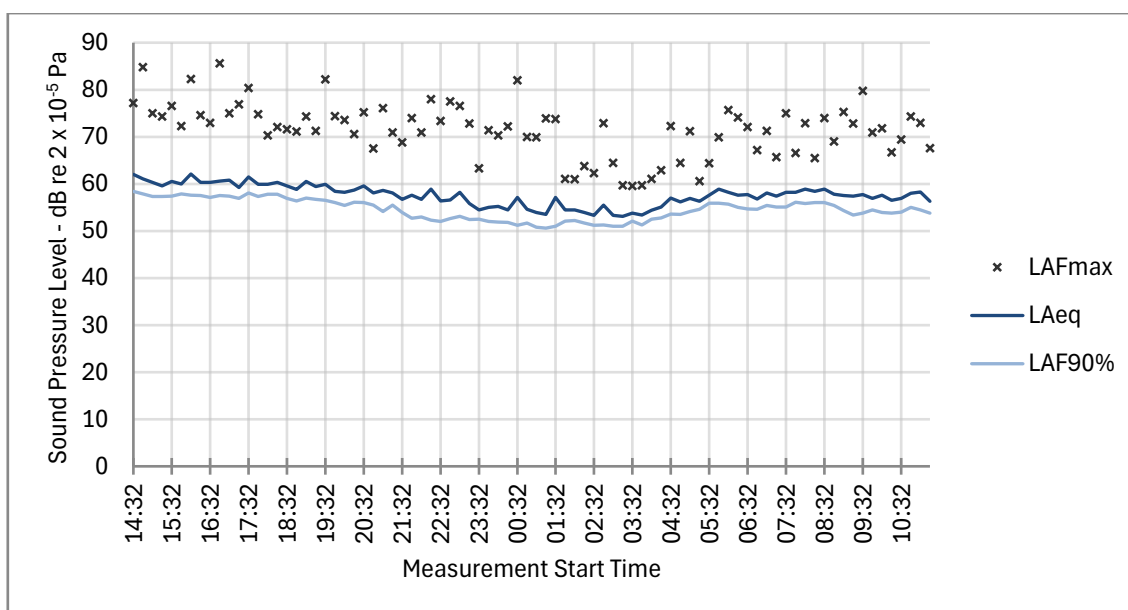


Figure 4: Sound level survey results to the rear façade

Summary of the measured sound level results during the latest proposed opening hours for the LA90 are shown in tabular form in Table 2.

Assessment Location	22:00 – 23:00 Hours LAeq	22:00 – 23:00 Hours LA90	22:00 – 23:00 Hours L90	
			63Hz	125Hz
Front façade, Manchester Road	67 dB	51 dB	52	48
Rear façade, Charlton Street	57 dB	52 dB	50	49

Table 2: Summary measured sound level survey results

4.2. Sound Insulation to Adjoining Residential Properties

To determine the acoustic performance of the separating walls of the proposed venue and adjoining residential properties, sound insulation tests were carried out through the separating wall to Room 3 of 852A which directly adjoins the first floor of the development site.

The survey was conducted by Tommy Burn of ACA Acoustics on 15th January 2025. The sound insulation performance of the separating partitions was measured generally in accordance with procedures set out in BS EN ISO 16283-1:2014 *Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation*.

The following equipment was used during the survey; the sound level meter was calibrated before the survey and checked after with no change noted.

Equipment	Serial Number
NTi Audio Class 1 sound level meter type XL2-TA	A2A-16877-E0
Svantek calibrator type SV33B. Compliant to IEC 60942:2003	57595

Table 3: Equipment used

Results of the measured level difference, in terms of weighted single-figure value, is shown in the table below.

Full results may be found within **Error! Reference source not found..**

Test Reference	Source Room	Receiving Room	Level Difference D_{w} (dB) (+ C'tr)
AW01	Ground Floor	First Floor Room 3	61(-4) dB
AW01	Ground Floor	Stairwell	61(-4) dB
AW03	First Floor	First Floor Room 3	46(-4) dB
AW04	First Floor	Stairwell	45(-5) dB

Table 4: Sound insulation test results

5. ASSESSMENT OF OPERATIONAL NOISE TO NEARBY PROPERTIES

5.1. Source Sound Levels

To calculate the potential impact of the proposed development it is necessary to establish typical sound levels within the new bar once it is trading; this is the source sound level data.

Sound levels have been recorded in a number of similar venues for previous projects. Spectra used in the assessment equates to an overall sound level of LAeq 94dB. This is representative of the internal sound level within a similar venue on a busy weekend evening, with a DJ playing. The measurement includes the venue at full capacity with patrons talking and laughing simultaneously and amplified music. Sound levels at low frequency are limited by compliance with the recommended criteria. It is recommended that a music volume limiter can be used to set maximum music sound levels to comply with these limits.

Confirmation of the source sound level data used in the assessment is shown in Table 5 below.

Description	Metric	Octave Band Frequency (Hz) – LAeq (dB)								dBA
		63	125	250	500	1k	2k	4k	8k	
Anticipated sound levels within the venue	Leq	87	89	94	92	89	81	77	73	93
	L10	90	92	99	94	92	82	79	76	96

Table 5: Typical source sound levels

5.2. Acoustic Assessment of Operational Noise Transmission Through the External Façade

A computer model has been used to calculate sound transmission via the shopfront to within the nearby residential properties. The model assumes windows closed, and uses the methodology of BS EN 12354-4:2000 to predict the transmission of indoor sound to outside and then the environmental corrections of ISO 9613-2:1996 to account for the distance from the shopfront to the residential windows, acoustic reflections, and acoustic screening.

The assessment includes an additional secondary glazed unit behind the existing windows as detailed in Section 6.

Summary of calculated sound emissions via the shopfront to outside the residential windows are shown in the table below.

Receptor Location	Internal Sound Level within the bar	Calculated sound level outside residential windows	Criteria
Properties at the front façade on Manchester Road	LAeq 94dB L10 63Hz: 91dB L10 125Hz: 94dB	LAeq 33dB L10 63Hz: 44dB L10 125Hz: 42dB	LAeq ≤51dB L10 63Hz: ≤52dB L10 125Hz: ≤48dB
Properties at the rear façade on Charlton Street		LAeq 22dB L10 63Hz: 34dB L10 125Hz: 35dB	LAeq ≤52dB L10 63Hz: ≤50dB L10 125Hz: ≤49dB
Adjoining Properties at 852A Manchester Road		LAeq 38dB L10 63Hz: 49dB L10 125Hz: 49dB	LAeq ≤52dB L10 63Hz: ≤50dB L10 125Hz: ≤49dB

Table 6: Summary of calculated sound emissions via the openable shopfront to outside noise-sensitive properties

The assessment includes façade elements as shown in Table 7 below.

Description	Construction	Sound Insulation Performance
External façade	Brick-cavity-brick construction	Rw (+C'tr) 54(-6)dB
Glazing	Secondary glazing comprising laminated 8mm inner pane installed behind existing glazing	Rw (+C'tr) 47(-7)dB
Roof	Tile/slate roof with 25mm (2 no. layers 12.5mm) SoundBloc plasterboard ceiling and high density rockwool insulation in the cavity	Rw (+C'tr) 46(-7)dB

Table 7: Facade elements included within the assessment

The current installed glazing specification is unknown, however installing secondary glazing to the rear of these windows with minimum cavity of 100mm between should ensure that the sound insulation performance exceeds the minimum standard shown in the table above. This is required to glazing at both front and rear facades. In addition, the roof/ceiling structure should incorporate the construction shown in Table 7.

With benefit of noise control treatments as shown in Section 6, calculated sound levels will achieve the required criteria.

5.3. Acoustic Assessment of Internal Operational Noise Transmission

Based on the anticipated source sound level and the measured level difference of the stripped-out structure along with proposed mitigation measures detailed in Section 6, resultant sound levels in the adjoining residential properties are shown in Table 8 below.

Source LAeq	Calculated Level of Sound Transmission to Adjoining Properties	Criteria
93dBA as Table 5	NR 15	NR 15

Table 8: Calculated operational sound transmission from the bar to adjoining residential receptors

Results in Table 8 confirm that with mitigation works as recommended by ACA Acoustics then noise emissions to the residential properties rooms will achieve the recommended criteria.

6. Acoustic Mitigation Treatments

6.1. Acoustic Partition Between Venue and Adjoining Properties

It is recommended that an independent lining is installed to all external and party walls of the development site. The separating wall between the venue and residential properties is key, however linings to other less direct walls will also be required to control flanking noise transmission.

Specification for a suitable acoustic partition and flanking walls and columns will typically comprise:

- 3 layers 15mm SoundBloc plasterboard, supported on independent studs with 150mm cavity and 100mm rockwool insulation in the void. All plasterboard joints should be staggered, taped, and skimmed.
- Where the partition abuts the ceiling and the walls, the partition must not be structurally connected, but be independent, with stud framework supported on resilient strips.
- It is recommended the acoustic linings are imperforate. Necessary small penetrations, such as for cables, must be sealed with a flexible mastic.

6.2. Façade Acoustic Treatments

As per Table 7 above, it is recommended that secondary glazing is installed to the the existing glazing at both front and rear facades. In addition, the existing roof and ceiling structure should be upgraded to match the performance shown in Table 7.

6.3. Door Lobbies

In order to ensure sound levels from venue are minimised when patrons are entering and leaving it is recommended that a door lobby is installed to the front and rear external doors. It is recommended that the lobbies incorporate acoustically absorptive finishes.

Doors should be on closers to ensure that they cannot be left open and should incorporate acoustic P or O type seals.

6.4. Music Volume Limiter

The music system should be a modern networked system such as Soundweb or incorporate a separate volume limiter. This allows the maximum music volume to be set and locked, which cannot be overridden by staff. A suitable limiter will include a graphic equaliser, allowing individual frequencies to be set at the required level such that internal sound levels in Table 5 aren't exceeded.

ACA Acoustics would be able to attend site once the system is installed to assist in setting the limiter to a level to ensure music noise transmission achieves the requirements of the Local Authority.

Where appropriate the music volume limiter would be set in conjunction with the sound engineer, and ACA Acoustics. Music would be played in the venue while noise monitoring and subjective listening is undertaken in the adjoining residential properties and outside nearby dwellings to confirm an acceptable level has been achieved.

7. CONCLUSION

ACA Acoustics have assessed operational noise breakout of a proposed bar at 854 Manchester Road, Castleton, Rochdale.

Allowing for the proposed mitigation strategy set out in this report, sound transmission will be below the existing background sound levels and will not be detrimental the amenity of nearby residential properties.

It is recommended that planning consent may be granted for the development and no further mitigation measures are required.

