

Acoustic South East



Noise Assessment – Change of Use

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Project: J3768

Issue 1

Site: **The Ironworks, Cheapside, Brighton. BN1 4GD**

Client: **Flat Yard Limited**

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Issue 1	02/01/2024	Original Issue
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1 Introduction and Executive Summary

Acoustic South East have been appointed to undertake an acoustic assessment to support a planning application for a change of use. Specifically, it is understood that Brighton and Hove City Council wish to see a retrospective submission for a change of use from Class E to a mixed class E/sui generis use.

Standards and guidance referenced for this assessment include:

- BS8233 (Sound insulation and noise reduction for buildings) 2014
- Acoustics, Ventilation and Overheating Guidance, Jan 2020
- BSEN ISO9921:2003- *Ergonomics – Assessment of Speech Communication*

Two class 1 sound level meters were set up on the site over a week period to measure both internally inside Studio A as well as externally, adjacent to the normal front door access and gazebo where drinks/smoking/vaping might reasonably occur by patrons.

A sound insulation break out test was undertaken to ascertain how studio A and B perform in terms of the building envelope containing sound energy.

Worst case measured noise levels from inside studio A and B and outside (adjacent to the front door) were assessed against the measured soundscape likely to be experienced by the nearest residents at Blackmore Court to the North.

The assessment indicated that the noise emissions from the site and indeed people noise are below the measured soundscape and should not give rise to noise concerns for residents.

Combined with the noise mitigation measures already employed by the premises, ie perimeter checking, patrons leaving by different access, 21:00 hours curfew for use of the external area, the results indicate that the site is being managed and that noise emissions are not a concern for nearby residents.

Retrospective planning permission for a class E to a mixed class E/sui generis use should not therefore be withheld on noise grounds.

2 Context, Noise Criteria & Noise Assessment Methodology

2.1 Context

Brighton and Hove City Council as the local planning authority have requested a retrospective planning application for a change of use. The current listing is offices and class E, however a 'sui generis' use class (mixed use class E) is being sought to accommodate theatre, live music events which take place on occasional evenings etc.

The Ironworks occupies the ground floor of the building as shown in Figure 1 below. Offices in different ownership occupy the first floor.

The site operates as a comedy club/theatre/arts space and this is primarily inside Studio A. Studio B is the break out space and it is utilised and occupied prior to any shows, at intervals and post production. Studio C remains outside of the scope of the assessment due to different ownership.

The focus of the report is therefore on Studio A and B as the spaces most likely to impact any residential neighbours to the North.

The site no longer operates temporary event notices (TENS) in order to put on short notice events.

2.2 Current Measures to Minimise Sound Concerns from the Site

The premises employ a number of mitigation measures to ensure that the soundscape generated within the Ironworks is kept inside the Ironworks and these are as follows:

- Technical staff regularly undertake external subjective assessments of the sound and these are reinforced with readings.
- Door staff are employed on a risk basis to manage the flow of patrons.
- The external seating area ceases to be used beyond 21:00 hours
- When patrons depart the premises, a different exit is utilised on Blackman Street which is predominantly offices rather than residential occupancy.
- Loading for events is carried out during daytime hours and also via Blackman Street
- No Temporary Event Notices occur and all events are within the premises licence (licensing Act 2003)

2.3 Site Location

The application site is detailed with a red outline in Figure 1 below. To the North is Cheapside. To the immediate East is Halfords as a commercial premises and then Whitecross Street. To the West is Blackman Street and offices are located further West (Brinell Building).

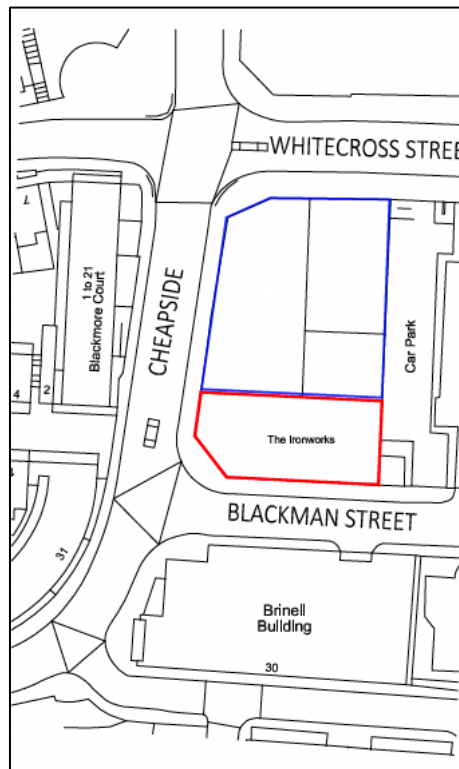


Figure 1. Site Location

2.3.1 Internal Floorplan

The ground floor layout can be seen as follows:

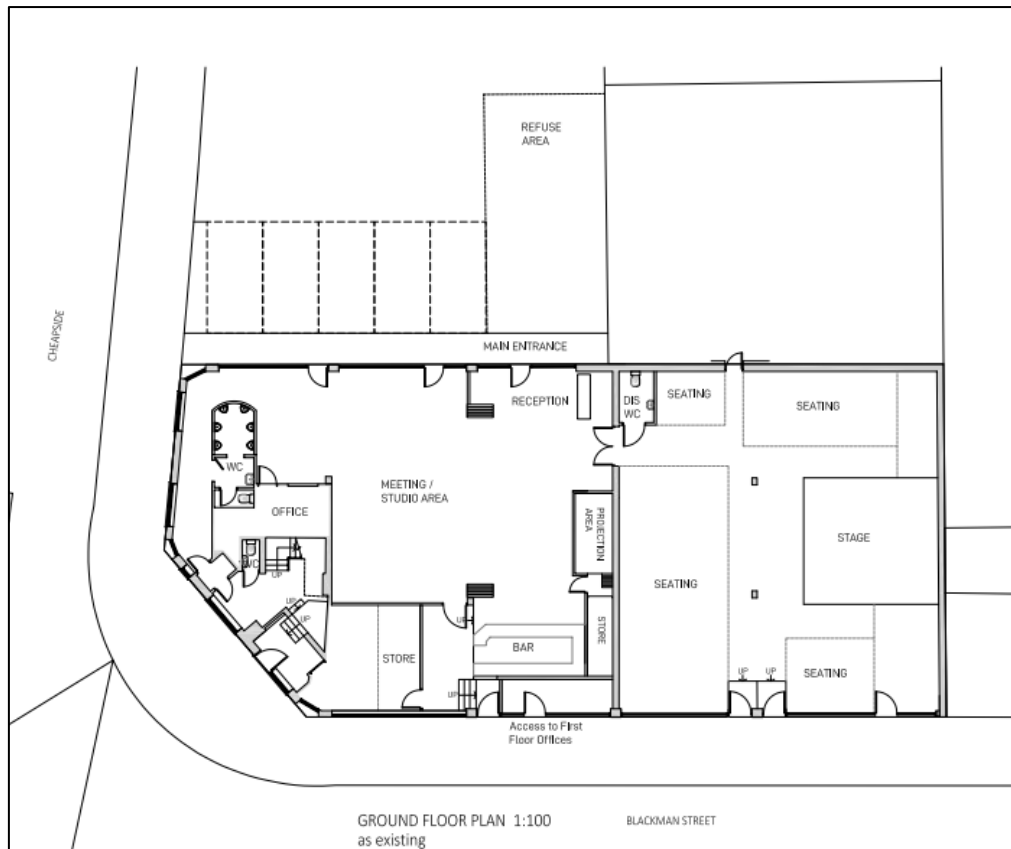


Figure 2. Ground Floor Layout

Figure 3 below shows Studio A as the principal theatre/exhibition space and Studio B as the entry/congregation area prior to filling up Studio A and would be used for any interval periods.

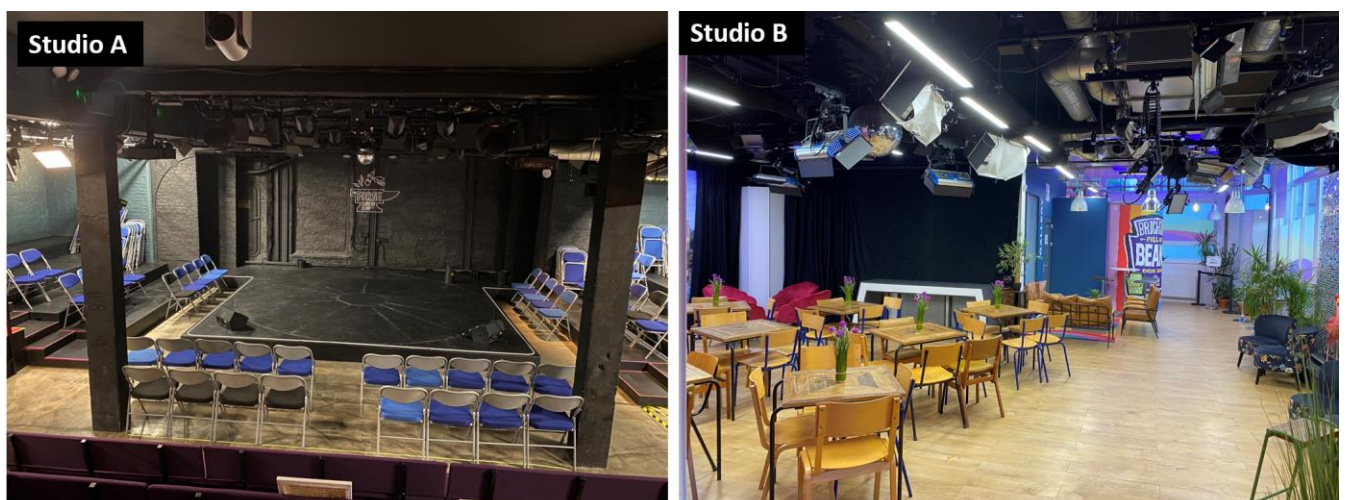


Figure 3. Inside Ironworks

2.4 Soundscape

The soundscape outside of the site was dominated by road traffic noise, intermittent sounds from Halfords, gull noise as well as distant construction noise.

2.5 Closest Residential Property/Window

The closest residential property are flats to the North, Blackmore Court (1-21)

2.6 Assessment Methodology

To consider how sounds from the venue might impact the nearest residential properties the following was undertaken:

1. Measure the attenuation of the building fabric by carrying out an airborne sound insulation test to excite the inside of Studio A and B and then measuring externally with and without the pink noise being played to correct for background.
2. A class 1 sound level meter was left in Studio A to identify a worst-case hour and the spectral profile of the shows being played over a week period.
3. An additional class 1 sound level meter was also left at the area where patrons congregate at the site entrance to assess the extent of any noise generated and to be able to compare and contrast nights without activities being undertaken at the Ironworks.
4. The duration of the assessment also deliberately included a weekend and a number of Christmas events/shows as well as nights without any activity.
5. By being aware of the building performance in terms of attenuation, and the sound levels generated internally (Studio A), it is possible to predict how sound may escape the building and model how this propagates to the nearest residential dwellings/flats.
6. Unfortunately, due to the location, a secure position to mount a sound level meter in a city centre location at the pavement position was not considered practical. Therefore, a short sound reading was undertaken at the edge of the roadside to compare against the long-term sound level meter to understand what the road traffic noise might look like for residents who overlook the site at Blackmore Court.

2.7 Assessment Locations



Figure 4. External Survey Positions (Left-Long-term-Right -Short term)

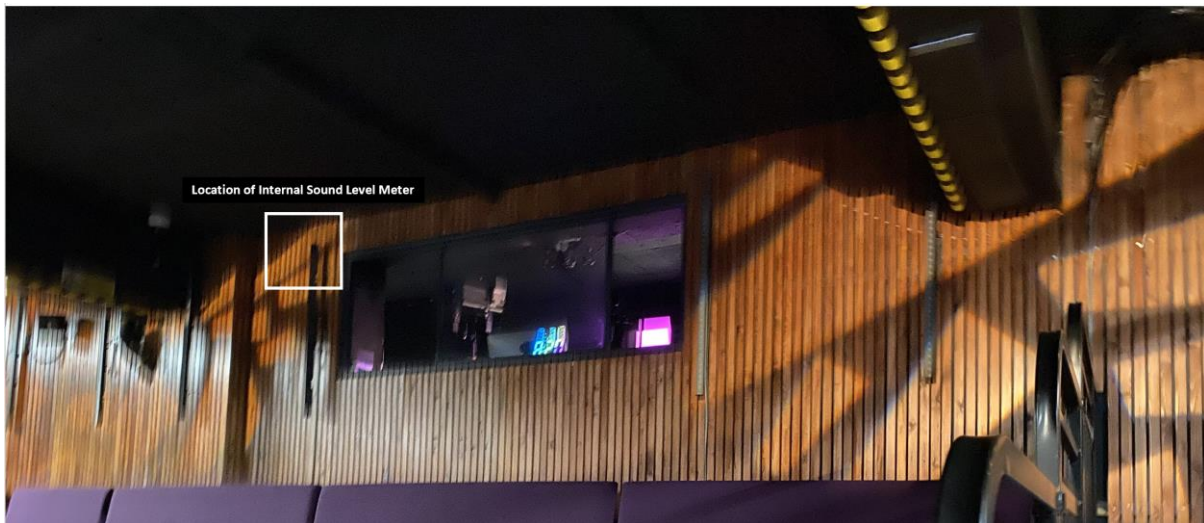


Figure 5. Location of Internal Sound Level Meter (Studio A)

Survey(s) carried out by	Scott Castle BSc(Hons) Env Health, MCIEH CEnvH PGDip Acoustics MIOA
Equipment Used	Studio A – 01dB Symphonie, Class 1 Sound level meter External -Svantek Mirus 971, Class 1 Sound level meter
Equipment Used	Castle Acoustic Calibrator – Serial No. 041173
Duration	11 th to 18 th December 2023

Figure 6. Survey Equipment

3 Events Held

A number of events were held on the run up to the Christmas during the survey period and these included:

- Long Nose Puppet Shows – Childrens events, mid-morning and early afternoon shows
- In a Sense – 20:00 hours start. Monday 11th December
- Tinsel and Tassels – Cabaret event – Friday 15th December – 20:00 hours show
- Club Xmas Party – Sat 16th December- 20:00 hours show
- DWNN and Delilah Show, Sun 17th December – 19:30 show.

4 Results

4.1 Outcome of Sound Insulation Testing

To determine how sound breaks out of the venue spaces, an inside to outside sound test was carried out. This involved playing high volumes of pink noise (98-99dB $L_{Aeq,30 \text{ seconds}}$) inside studio A and B, measuring internally, and then measuring externally, still with the pink noise being broadcast. The internal sound source was then switched off and the sound pressure levels corrected for background.

The resulting D_w values represent the attenuation of the building envelope for Studio A and B. These were as follows:

Studio A – 41.7dB

Studio B – 31dB

4.2 Outcome of Internal Survey (Studio A)

A class 1 sound level meter was placed into the rear and secured against the wall of Studio A. It measured in Fast time weighting and dB $L_{Aeq,1 \text{ second}}$ and has been converted into 1-hour periods to identify a worst-case scenario. The shaded orange cells represent the highest measured single hour period.

Studio A Internal Sound Level Meter-dB L _{Aeq, 1 hour}							
Time	Mon	Tues	Wed	Thu	Fri	Sat	Sun
07:00		29.3	31.4	30.6	31.3	28.8	28.8
08:00		30	33.2	31.9	32.3	50.9	50.9
09:00		31	40.4	32.3	32.6	65.3	52.2
10:00	33	49.1	59.6	49.8	36.4	65.2	60.9
11:00	45.7	48.1	56.9	52.8	50.3	75.9	73.7
12:00	42.5	55.4	44.2	35.5	41.3	57.9	55.7
13:00	52.2	46.2	49.9	45.8	36.4	59.8	66.7
14:00	48	44.6	43.3	35.1	44.3	74.4	74.6
15:00	60.6	50	43.9	41.4	50.2	55.8	57.8
16:00	65.4	47.6	54.4	33.1	67.9	64.9	75.6
17:00	74.8	44.2	64.2	32.4	81	67	66.7
18:00	85.2	49.1	53.4	32.9	82.5	67.4	60.4
19:00	80.2	30	59.9	31	79.4	77.1	85.1
20:00	86.2	29.4	51	31.2	90.9	83.4	86.2
21:00	87.2	28.9	59.9	29.1	89.9	82.4	87.9
22:00	82.8	28.9	58.9	31.4	88.4	59.6	85.9
23:00	52.9	27.8	56.7	29.4	59.5	58.5	47.8

Figure 7. Studio A - Measured Hourly Data

The worst-case internal hour is 91dB L_{Aeq, 1 hour} (rounded) and according to the timetabling is the Friday evening cabaret, Tinsel and Tassels.

4.3 Outcome of External Survey

A sound level meter was placed adjacent to the front door (primary access) and the covered gazebo area to measure sound pressure levels. The results are façade and seen in Figure 8 below.

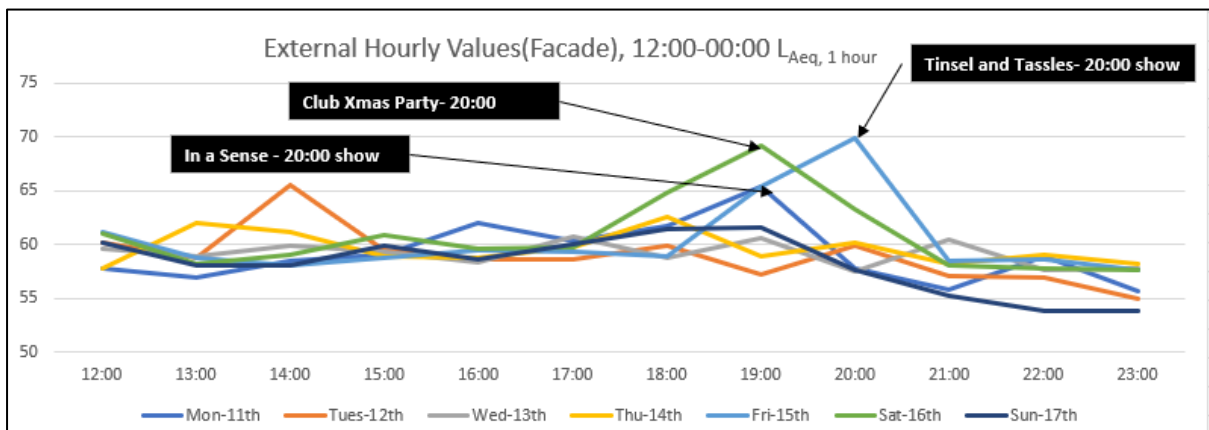


Figure 8. Measured Hourly Data, Externally, by Front Door

A number of items may be drawn from the measured sound pressure levels as follows:

- The noisiest event was consistent with the event organisers/management suggestions regarding the cabaret/Tinsel and Tassells on the Friday evening.
- Consistent with the management narrative, the data does not indicate any increased sound pressure levels post 21:00 hours when the area is closed off.
- It is also apparent that there are not events all of the time and with this in mind, the Tuesday, Wed and Thursday evenings (12-14th December 2023) may be used as the baseline to consider normalised sound pressure levels outside of the premises.

4.4 Outcome of Attended Survey-Roadside Noise (Simultaneous Assessment)

Having set up the external sound level meter by the primary access, a simultaneous 10minute reading was taken at the building edge, level with the pavement onto Cheapside to the North. The position was laser measured as 17.4m in distance. Both sound level meter clocks were synchronised to allow a like for like measurement.

The rationale for the simultaneous measurement being that the road traffic noise generated by Cheapside traffic will be experienced by Blackmore Court, as the same. Therefore, if evenings without any entertainment are assessed at the front door and the correction applied, it is fair to assume that the residents will experience that as a baseline sound pressure level.

- The measurement close to the front door was 57.7dB $L_{Aeq, 10 \text{ minutes}}$.
- The measurement position at the pavement edge was 64.1dB $L_{Aeq, 10 \text{ minutes}}$.

Therefore, it is reasonable to assume that it is noisier closer to Cheapside due to the road traffic noise and that a correction of 6.4 decibels can be applied to obtain a baseline of what the residents of Blackmore Court might experience.

4.5 Predictions of Noise Breakout from Studio A

Using a worst case of Studio A for the Tinsel and Tassells event, this was 91dB $L_{Aeq, 1 \text{ hour}}$. This occurred at 20:00-21:00 hours on the Friday 15th December.

With Studio A and the intervening Lobby of studio B, the breakout of sound energy from inside to outside is likely to be 42dB rounded.

The sound externally of the ironworks building resulting from the studio A show is therefore 49dB $L_{Aeq, 1 \text{ hour}}$ (91 minus 42).

Reviewing the same time period, ie 20:00-21:00 hours for Tues-Thurs (12th-14th Dec), the sound pressure level outside the front door without any shows was an average of 59dB $L_{Aeq, 1 \text{ hour}}$.

To correct this baseline closer to the road, an additional 6.4dB may be applied, see section 4.4 above.

The soundscape likely to be experienced by residents of Blackmore Court to the North is therefore 65.4dB $L_{Aeq, 1 \text{ hour}}$.

Clearly sound will attenuate with distance but even assuming no distance attenuation, the sound from the show is 16.4dB below the measured ambient noise levels. The sound pressure level would only decrease further with distance attenuation applied.

Therefore, as a worst case, the break out sound from Studio A is comfortably 16dB below ambient noise levels.

4.6 Predictions of People Noise from Outside Main Door

The likely arrival and any interval for the Tinsel and Tassels event provided for the highest sound pressure level externally for the outside area. This accounted for an external sound pressure level of 70dB $L_{Aeq, 1 \text{ hour}}$.

The distance from the gazebo to the façade of Blackmore Court is approximately 34m.

The sound level meter was located at approximately 1m from the gazebo.

A distance attenuation calculation can be undertaken to determine the loss in sound pressure levels using $20\log(34/1)$. This will provide a loss of 30.6dB.

Therefore, the predicted sound pressure level at the façade of Blackmore Court from people noise alone is estimated to be 39.4dB $L_{Aeq, 1 \text{ hour}}$.

The sound from outside patrons/arrivals must therefore be considered in context and again uses the ambient noise levels derived in section 4.5 above, (ie Tues-Thu night 20:00-21:00 hours will be 65.4dB $L_{Aeq, 1 \text{ hour}}$).

The sound from patrons is therefore 25dB below the ambient noise levels and should not be audible at such levels.

It is wise to also consider a worst-case assessment with a resident having an open window. Consistent with the Acoustics, Ventilation and Overheating Guidance, (AVOG, March 2020), a partially open window is taken to provide 13dB of attenuation from outside (freefield) to inside (reverberant) conditions.

Therefore 39.4dB with 13dB subtracted for an open window accounts for 26.4dB inside a habitable room. Given that people noise is likely to include laughter, changes in tone and pitch, it would be reasonable to argue that the sound is not continuous and anonymous. Accordingly, the 35dB $L_{Aeq, 16 \text{ hour}}$ normally provided for internal sound pressure levels where sound is continuous and anonymous will not apply, albeit a worst case hour is already being used. Notwithstanding this, a reduction of 5dB to the internal daytime table 4 values from BS8233:2014 will be an internal sound pressure level of 30dB $L_{Aeq, 16 \text{ hour}}$.

The internal sound pressure level from people noise is 3.6dB below the more stringent target and people noise is not likely to present a concern to local residents.

Context is entirely relevant. As previously discussed, the front door and gazebo area ceases at 21:00 hours and at the end of shows, customers are shown to exits on Blackman Street which is dominated by offices without being overlooked by residents.

4.7 Predictions of Noise Breakout from Studio B

It is estimated that Studio A can hold approximately 220 individuals and it is reasonable to assume that at an interval or break, these could occupy Studio B and the bar area. An estimation of sound pressure levels is therefore made as follows.

It is reasonable to assume that with a speaker listener relationship, not all individuals talk at the same time, so at a worst case there will be a single listener and a single speaker.

BSEN ISO9921:2003 has data for a normal vocal effort (60dB L_{Aeq} , at 1m) and a raised vocal effort (66dB L_{Aeq} , at 1m), so for the purposes of a robust assessment, it is appropriate for 220 individuals to consider 110 speaking at once, with 55 at a normal vocal effort and 55 using a raised voice. The sound pressure levels can be considered as follows:

Normal voice = $60+10\log(55)= 77.4\text{dB } L_{Aeq,T}$

Raised voice = $66+\log(55) = 83.4 \text{ dB } L_{Aeq,T}$

Combined total of 110 speakers = $84.4\text{dB } L_{Aeq,T}$

Based on the measured performance of the building attenuation, this would likely attenuate by 31dB with the resulting external sound pressure level being 53.4dB $L_{Aeq,T}$.

This figure must also be considered in context in that it does not occur all of the time and the external soundscape for the period in question is significantly higher at 65.4dB for the Blackmore Court residents to the North. Therefore, the sound externally before any distance attenuation is already 12dB below measured ambient noise levels.

5 Discussion

The assessment has used a worst case measured sound pressure level from inside studios A and B to determine how this might propagate and impact nearby residents. This is not likely to be heard by the closest residents at Blackmore Court with the Cheapside Road traffic noise being the dominant sound source. To quantify the break out noise, the same time period was used without the site having any shows in order to compare ambient noise levels.

People noise/arrivals/intervals were also assessed at the front door gazebo location, again using the worst case measured external hour and were noted not likely to be significant to residents to the North.

It is understood that historic complaints had arisen due to the front door being left open accidentally and that this is no longer the case with site management aware of this.

6 Conclusion

Two class 1 sound level meters were set up on the site over a week period to measure both internally inside Studio A as well as externally, adjacent to the normal front door access and gazebo where drinks/smoking/vaping might reasonably occur by patrons.

A sound insulation break out test was undertaken to ascertain how studio A and B perform in terms of the building envelope containing sound energy.

Worst case measured noise levels from inside studio A and B and outside (adjacent to the front door) were assessed against the measured soundscape likely to be experienced by the nearest residents at Blackmore Court to the North.

The assessment indicated that the noise emissions from the site and indeed people noise are below the measured soundscape and should not give rise to noise concerns for residents.

Combined with the noise mitigation measures already employed by the premises, ie perimeter checking, patrons leaving by different access, 21:00 hours curfew for use of the external area, the results indicate that the site is being managed and that noise emissions are not a concern for nearby residents.

Retrospective planning permission for a class E to a mixed class E/sui generis use should not therefore be withheld on noise grounds.