

Project

Co-op Live
Noise Breakout from Ancillary Hospitality
Spaces

Prepared for

Oak View Group
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Mayfair
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WIS IDG

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Summary

Oak View Group appointed SRL Technical Services Ltd (via BAM Construction) to report the findings from the noise breakout validation testing of the ancillary hospitality areas. The testing has been done to support a variation to the planning permission which proposes extending the operating hours of the ancillary hospitality areas (as per application ref I39501/JO/2024).

The ancillary hospitality areas are the Decibel Club, Bentley Record Room, West Atrium and Backstage Bar.

We have used the noise measurements to demonstrate that music breakout from the ancillary hospitality spaces meets the low frequency noise limits at 63Hz and 125Hz.

The music noise levels at 250Hz to 4kHz which have been derived from the noise measurements are not considered to be accurate because ambient noise levels from other local sources are around 20dB higher than the music breakout noise limits and it is not possible to say categorically that one noise source is 20 dB lower than another noise source.

We have therefore used the following evidence to determine that the music breakout from the ancillary hospitality spaces also meets the noise limits at 250Hz to 4kHz:

- Music was completely inaudible at the measurement location at all times.
- The measured noise levels were very consistent with music on and music off. This consistency demonstrates that the ambient noise levels are dominant.
- Low frequency noise is much more difficult to control, and therefore as it's been possible to demonstrate that the low frequency noise breakout levels are below the noise limits, it's very likely that the high frequency breakout levels are significantly below the noise limits.

Based on the above evidence, we conclude that music breakout from the ancillary hospitality spaces meets the entertainment noise limits at all frequencies. The demonstrates compliance with the agreed noise limits for the ancillary hospitality spaces and supports the application to extend the operating hours of these spaces so noise should not be a reason for refusal.

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1.0 Introduction

Condition 14 of Planning Permission Ref: I26431/FO/2020 (as amended), which is attached to the Co-op Live arena, is worded to limit the hours of operation for events and hospitality use between the hours of 0900 and 0000 Monday to Sunday, with flexibility to agree extended hours with the Local Planning Authority on a maximum of 25 occasions per annum.

A Section 73 application has been submitted to vary the hours of operation for the ancillary hospitality spaces (application ref. I39501/JO/2024), in line with the Premises Licence with Manchester City Council (March 2024).

Table 1 – Proposed operating hours for ancillary hospitality spaces

Period	Currently Permitted Hours	Proposed Opening Hours
Sunday to Thursday	09:00 to 00:00	10:00 to 01:00 (with closing time of 01:30)
Friday and Saturday	09:00 to 00:00	10:00 to 02:00 (with closing time of 02:30)
Sundays prior to a Bank Holiday	09:00 to 00:00	10:00 to 02:00 (with closing time of 02:30)

The closest and most affected noise sensitive receptor is the residential block at No. 2 Stuart Street which is located approximately 100m to the east of the site on the other side of Alan Turing Way as highlighted by the blue square in Figure 1.

Figure 1 - Stuart Street Receptor

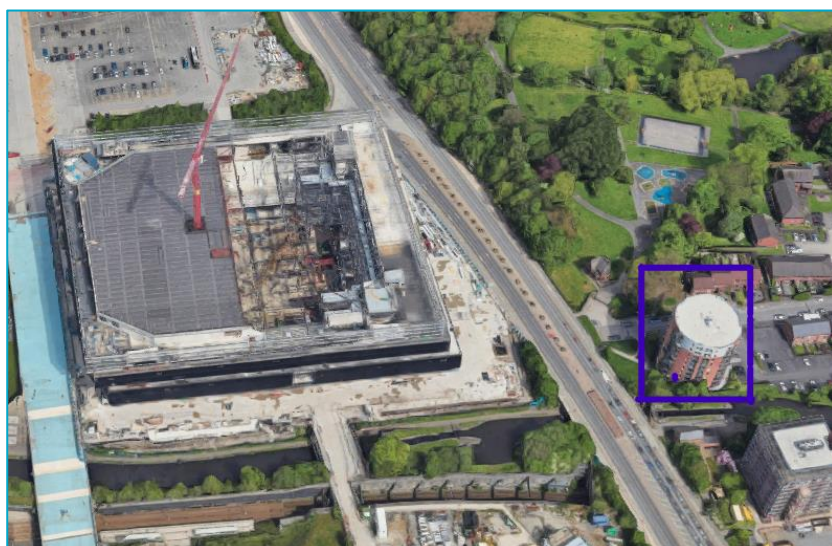


Figure 2 – Noise Measurement Location



The ancillary spaces are located on level 00 and level 01 of the arena so we consider the most affected dwellings to be at the lower levels of No. 2 Stuart Street. Noise measurements were therefore taken at ground floor level, approximately 1m from the façade of No. 2 Stuart Street as indicated in Figure 2.

Figure 3 – Installed Noise Logging Equipment



2.0 Criteria

The planning condition for event-noise breakout from the arena bowl attached to consent ref. 126431/FO/2020 is reproduced below. It has been agreed with Manchester City Council's Environmental Protection team that the same criteria which have been applied for the arena bowl are applied to noise breakout from ancillary areas at the nearby noise sensitive receptors.

2.1 Condition 23 - Entertainment Noise Breakout

Condition 23a states:

"The acoustic insulation of the arena building hereby approved shall be implemented in accordance with the following documents:

- *Appendix 10 of the Environmental Statement (Noise survey results) stamped as received by the City Council, as Local Planning Authority, on the 30 March 2020;*
- *Acoustic response prepared by BuroHappold stamped as received by the City Council, as Local Planning Authority, on the 17 June 2020; and*
- *Technical Note 'Noise and Vibrations' stamped as received by the City Council, as Local Planning Authority, on the 3 July 2020".*

Buro Happold and Vanguardia agreed noise limits with Manchester City Council (MCC) which are based on MCC noise and planning guidance for low frequency entertainment noise within dwellings:

"Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (L_{eq}), respectively".

The noise limits for the other octave bands above these frequency ranges (250Hz upwards) are 10dB below the baseline L_{90} noise levels.

The proposed limits for noise from late night use of the ancillary areas, at 1m from the façade of the nearest noise sensitive receptors, are taken from the entertainment noise limits and summarised in Table 2.

Table 2 - External noise limits from use of ancillary areas at residential receptors

	Octave band centre frequency							dB(A)
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
L_{eq}, dB Day (07:00 – 23:00)	52*	46*	42	41	42	32	19	44
L_{eq}, dB Night (23:00 – 07:00)	52*	46*	34	32	32	22	16	35

* Noise limits include an assumed attenuation of 5dB at these frequencies for a façade containing an open window.

Should an assessment of noise break-out levels be subject to façade reflections (e.g. the windows are closed on the NSR) then the noise level limits detailed above are subject to a 3 dB addition in all octave band frequencies.

3.0 Noise Breakout

3.1 System Set-up and Calibration

Vanguardia set music playing simultaneously within the following four ancillary hospitality spaces. The dance track “Get Lucky” by Daft Punk was configured to provide 5 minutes of audio on and 5 minutes of audio off across a 30-minute period.

- L00 Decibel Club
- L00 Bentley Record Room
- L00 Atrium
- L01 Backstage Bar

Figure 4 – Level 00 Floor Plan

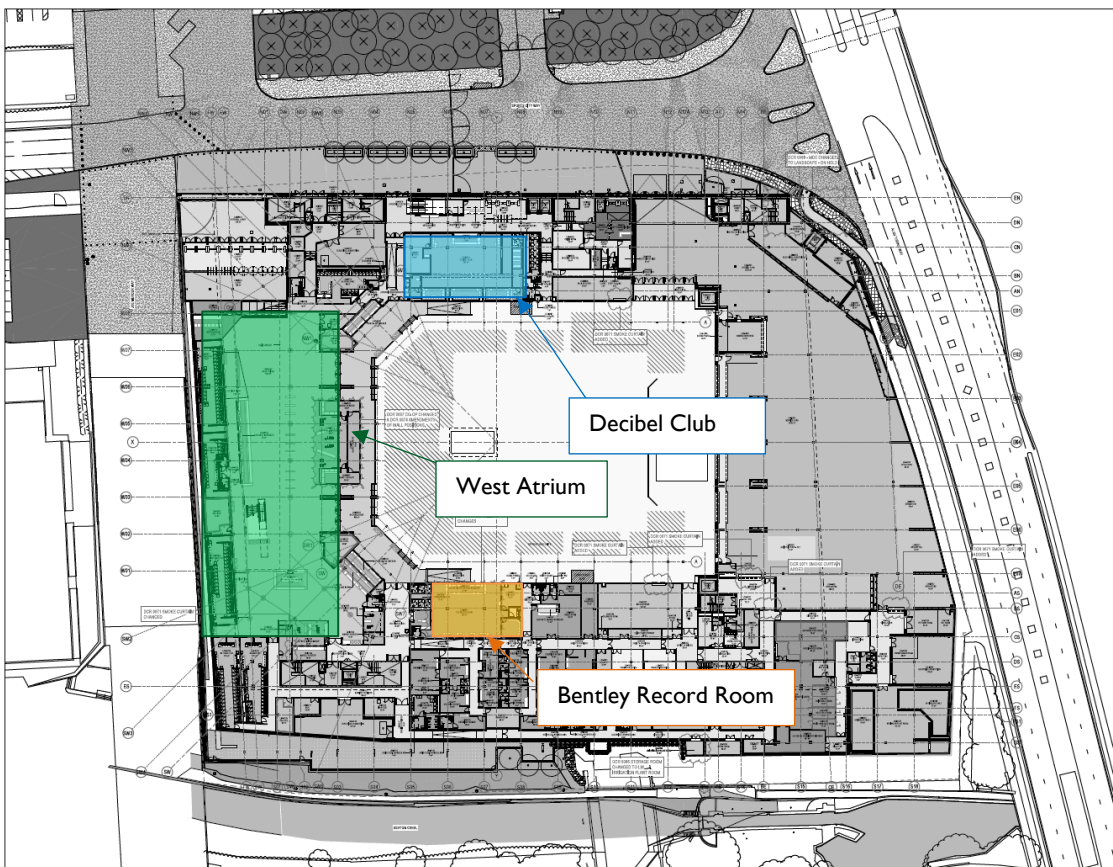
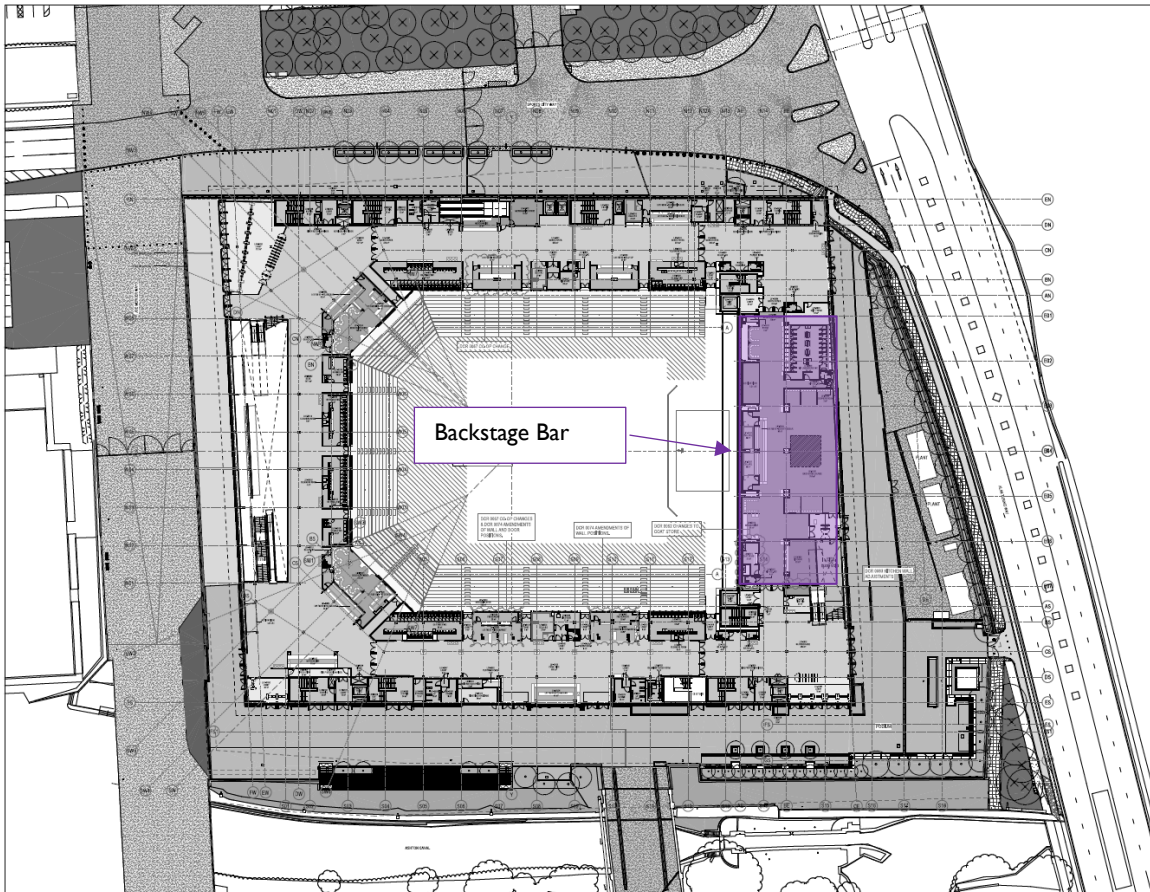


Figure 5 – Level 01 Floor Plan



Vanguardia has confirmed the following setup and calibration methodology was used for setting the noise levels within in the Atrium, Bentley Bar and Decibel Club:

“The permanently installed sound systems in the Atrium, Bentley Bar and Decibel Club were functioning and subsequently used for the testing. Note, as these are the installed Public Address and Voice Alarm (PAVA) system, they are not representative of any production audio systems. If production audio systems are considered for any of these spaces in the future, re-testing should occur to set appropriate internal noise levels.

For each of the above-named spaces, the signal was input to the PAVA system in the L04 control room. The volume on the playback device was increased till compression was observed on the input, as seen in Figure 4-1. It is understood this represents the maximum input level. The signal was routed to each of the spaces under test at the maximum send level, seen in Figure 4-2. This resultantly gave the maximum sound pressure level achievable by the installed system in each space”.

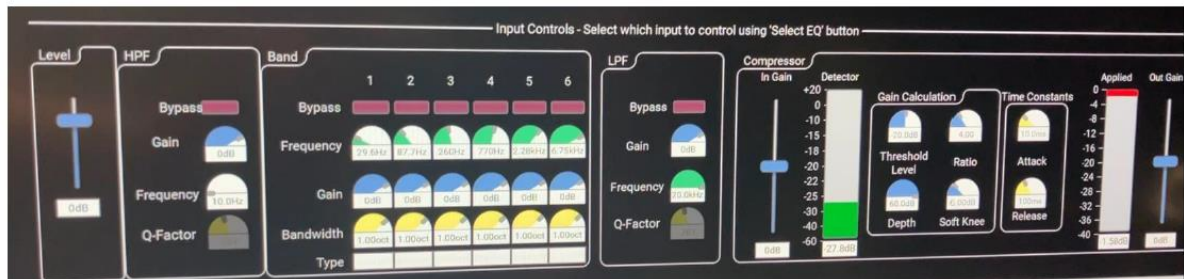


Figure 4—1 Input control panel

Zone 01	Core 1	South Hangout	+	6.20dB	Zone 21	L02-V
Zone 02	Core 2	South Hangout	+	6.20dB	Zone 22	L02-V
Zone 03	Core 3	South Hangout	+	6.20dB	Zone 23	L02-V
Zone 04	Core 4	South Hangout	+	9.20dB	Zone 24	L02-V
Zone 05	Core 5	South Hangout	+	9.20dB	Zone 25	L02-V
Zone 06	ATR-W	South Hangout	+	0dB	Zone 26	L02-V
Zone 07	L00-ART-S	South Hangout	+	6.20dB	Zone 27	L02-V
Zone 08	L00-DBC-N	South Hangout	+	0dB	Zone 28	L02-V
Zone 09	L00-FOC-S	South Hangout	+	0dB	Zone 29	L02-V
Zone 10	L00-PRD-S	South Hangout	+	6.20dB	Zone 30	L02-V
Zone 11	L00-SC-N	South Hangout	+	6.20dB	Zone 31	L02-V
Zone 12	L00-SF-E	South Hangout	+	6.20dB	Zone 32	L02-V
Zone 13	L00-SF-N	South Hangout	+	6.20dB	Zone 33	L03-E
Zone 14	L00-SF-S	South Hangout	+	6.20dB	Zone 34	L03-P
Zone 15	L00-VIPR-N	South Hangout	+	0dB	Zone 35	L03-P
Zone 16	L01-BSL-E(SZ3)	South Hangout	+	6.20dB	Zone 36	L03-P
Zone 17	L01-DS-N	South Hangout	+	9.20dB	Zone 37	L03-SF

Figure 4—2 Zone Send Levels at Maximum

Vanguardia has confirmed the following setup and calibration methodology was used for setting the noise levels within the Backstage Bar.

“The installed system in the Backstage was not ready for testing so a comparable overlay system was installed from the same loudspeaker manufacture. The sound pressure level of the system was set using a microphone at the rear of the main area on axis to the system. The system was set to a level representative of the upper operating range (102 dBA)”.

The measured levels within the Backstage Bar during the “music on” measurement period are summarised in Table 3.

Table 3 – Backstage Bar internal noise levels during measurements (dB, $L_{eq,5mins}$)

Octave band centre frequency, Hz							dBA
63	125	250	500	1k	2k	4k	
109	110	104	97	97	89	86	102

4.0 Subjective Noise Assessment

With music levels set up in the ancillary hospitality spaces using the methodology described above, the noise levels were subjectively assessed by Vanguardia and two representatives of Manchester City Council’s Licensing Out of Hours Team at the receptor location shown in Figure 2. They have reported that music breakout was completely inaudible at all times, even during lulls in road traffic.

5.0 Noise Measurements

Noise measurements were taken at the No. 2 Stuart Street receptor between 02:00hrs and 02:30hrs on Sunday 12th May 2024. Vanguardia took 5-minute noise level measurements at the location shown in Figure 2 alternately with music on and music off over a 30-minute period.

5.1 Assessment of Music Noise Levels

The requirement is for music noise alone to meet the stated limits at the receptor locations. The receptor noise measurements also include existing ambient noise, which is louder than noise from the sound source, so the music noise level must be derived from the measurements. For example, as the music breakout levels at the receptor locations are lower than the ambient noise levels, the music level can only be determined approximately, especially as the ambient noise varies over time. To allow more accurate measurements we have deliberately taken the measurements later at night when the ambient noise levels were lower.

Measurements have been assessed by the most relevant Scenario for each octave band from 63Hz to 4kHz.

Where the receptor L_{eq} noise level with music playing is the same (or less than) the ambient L_{eq} noise level without any music, then the music L_{eq} noise level is **at least** 10dB below the ambient L_{eq} noise level, however you cannot say with certainty how much below.

Where the receptor L_{eq} noise level with music playing is up to 3 dB higher than the ambient L_{eq} noise level alone, then it is possible to estimate the music noise level as follows.

Increase in measured noise level when music is playing	The “music” noise level alone is the measured noise level, minus
3 dB	3 dB
2 dB	4 or 5 dB
1 dB	6 to 9 dB

The calculation is:

$$\text{Music noise level } L_{eq} = 10\log_{10} (10^{L_R/10} - 10^{L_B/10})$$

Where:

- L_R is the measured receptor L_{eq} noise level (background noise plus “music” noise from the source)
- L_B is the measured ambient L_{eq} noise level

5.2 Measurement Results

Noise measurements at the Stuart Street receptor, taken at approximately 1.5m above the ground and 1m from the building façade are presented in Table 4. At all times noise from music breakout was inaudible, even during lulls in road traffic. Noise levels were dominated by other local sources; road traffic, residents talking on balcony, water lapping in canal and plant noise.

Table 4 – Music noise breakout measurements at Measurement Position 1 (Stuart Street Ground Floor), dB $L_{eq,5mins}$

Scenario	Start time	Octave band centre frequency, Hz							dBA
		63	125	250	500	1k	2k	4k	
Music ON	02:00	61	59	55	50	53	46	34	56
Music OFF	02:05	59	57	54	48	52	46	35	55
Music ON	02:10	58	57	54	49	53	48	42	56
Music OFF	02:15	58	56	53	47	52	45	32	54
Music ON	02:20	58	57	53	48	52.2*	46	34	55
Music OFF	02:25	59	57	53	48	51.2*	46	34	54

* Values reported to 1 decimal place to allow calculation of music noise where receptor L_{eq} noise level (ambient noise plus “music” noise from the source) is greater than the ambient L_{eq} noise level but not by more than 3dB.

The values highlighted **green** show that the receptor L_{eq} noise level (ambient noise plus “music” noise from the source) is no higher than the ambient L_{eq} noise level, and therefore the music L_{eq} noise level is **at least** 10dB less than the ambient L_{eq} noise level. The levels are also very consistent with music on and music off. This consistency demonstrates that the ambient noise levels are dominant.

The values highlighted in **blue** suggest that the receptor L_{eq} noise level (ambient noise plus “music” noise from the source) is slightly greater than the ambient L_{eq} noise level alone. We have therefore assumed a worst case scenario in our assessment, that the music is only around 6 dB below the measured level, although it is more likely to also be at least 10dB below as it was inaudible.

The values highlighted above have been used to derive the music noise level (without ambient noise) using the methods described in Section 5.1 above. Please note that these are the highest levels that the music noise could potentially be.

Table 5 – Derived music noise levels at Measurement Position (Stuart Street Ground Floor)

	Octave band centre frequency, Hz							dBA
	63	125	250	500	1k	2k	4k	
Music noise level at Stuart St Ground Floor ($L_{eq,5mins}$, dB)	≤ 48	≤ 47	≤ 43 ²	≤ 38 ²	≤ 45 ²	≤ 35 ²	≤ 22 ²	≤ 47 ²
Entertainment noise limits ($L_{eq,5mins}$, dB) ¹	55	49	37	35	35	25	19	38

¹ Noise limits include a 3 dB addition as the measured noise levels were subject to façade reflections.

² Derived music noise levels at 250Hz and above are not considered to be accurate because ambient noise levels from other local sources are significantly higher than the entertainment noise limits.

We have used the noise measurements to demonstrate that music breakout from the ancillary hospitality spaces comfortably meets the low frequency noise limits at 63Hz and 125Hz.

The music noise levels at 250Hz to 4kHz which have been derived from the noise measurements are not considered to be accurate because ambient noise levels from other local sources are between 12dB and 20dB higher than the music breakout noise limits. When there are two noise sources present (music and ambient) and one is inaudible (music), it is possible to say that the inaudible noise source is AT LEAST 10 dB lower than the other noise source, but not how much more than 10dB below.

We have therefore used the following evidence to determine that the music breakout from the ancillary hospitality spaces also meets the noise limits at 250Hz to 4kHz:

- Music was completely inaudible at the measurement location at all times.
- The measured noise levels were very consistent with music on and music off. This consistency demonstrates that the ambient noise levels are dominant.
- Low frequency noise is much more difficult to control, and therefore as it's been possible to demonstrate that the low frequency noise breakout levels are below the noise limits, it's very likely that the high frequency breakout levels are significantly below the noise limits.

Based on the above evidence, we conclude that music breakout from the ancillary hospitality spaces meets the entertainment noise limits at all frequencies. The demonstrates compliance with the agreed noise limits for the ancillary hospitality spaces.

Appendix A - Survey Details

A1. Location of Survey

2 Stuart Street, Manchester M11 4DG

A2. Date & Time of Survey

02:00 to 02:30 on 12th May 2024.

A3. Personnel Present During Survey

Olly Creedy (Vanguardia)
Tom Cotter (Vanguardia)

A4. Weather Conditions during Survey

14°C, low wind speeds of 2-3mph. No precipitation.

A5. Instrumentation

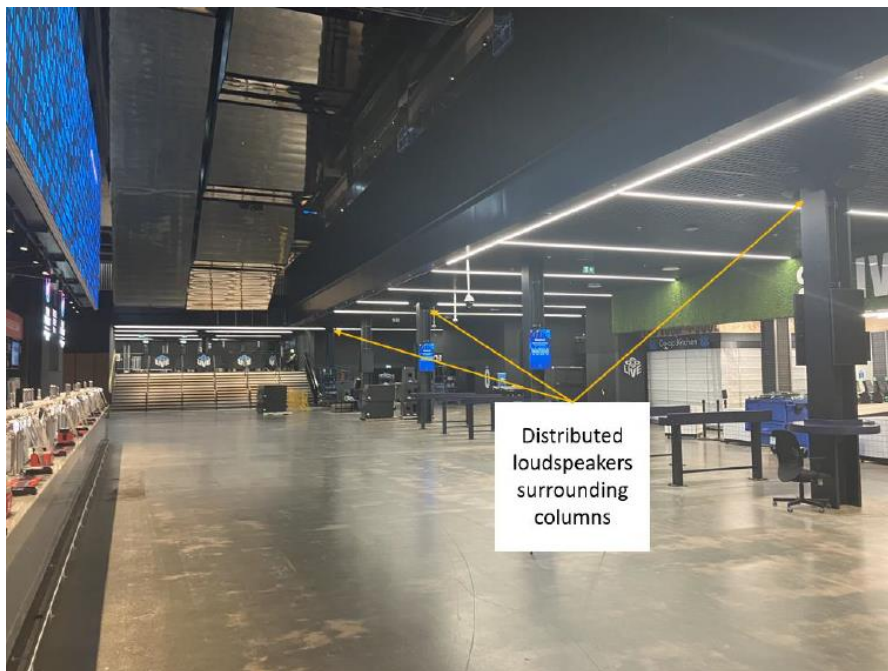
Type I Larson Davis LxT Sound level meter

A6. Calibration Procedure

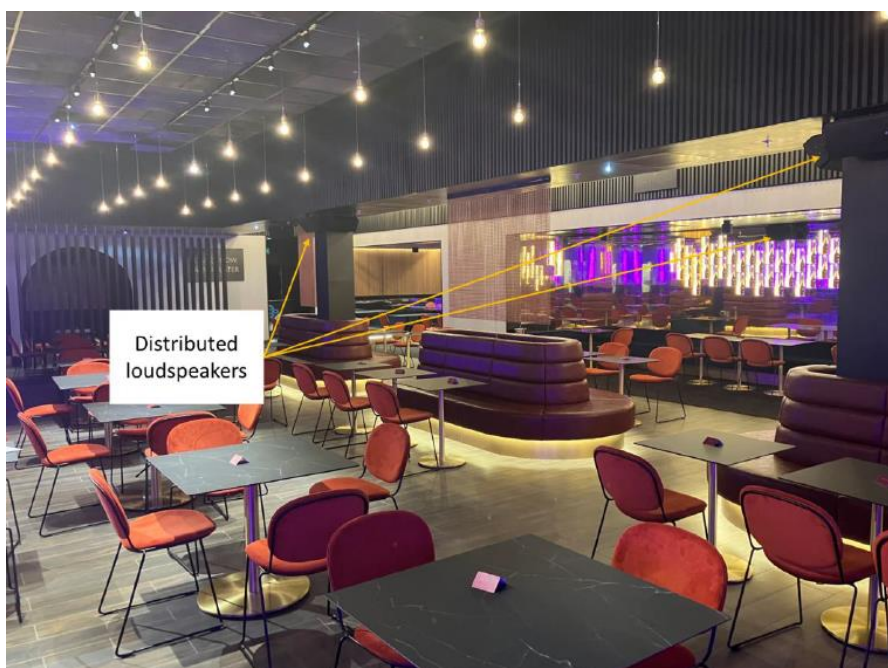
Before and after the survey the measurement apparatus was check calibrated. No significant drift was found to have occurred.

Appendix B – Ancillary Hospitality Spaces Photos

B1. West Atrium



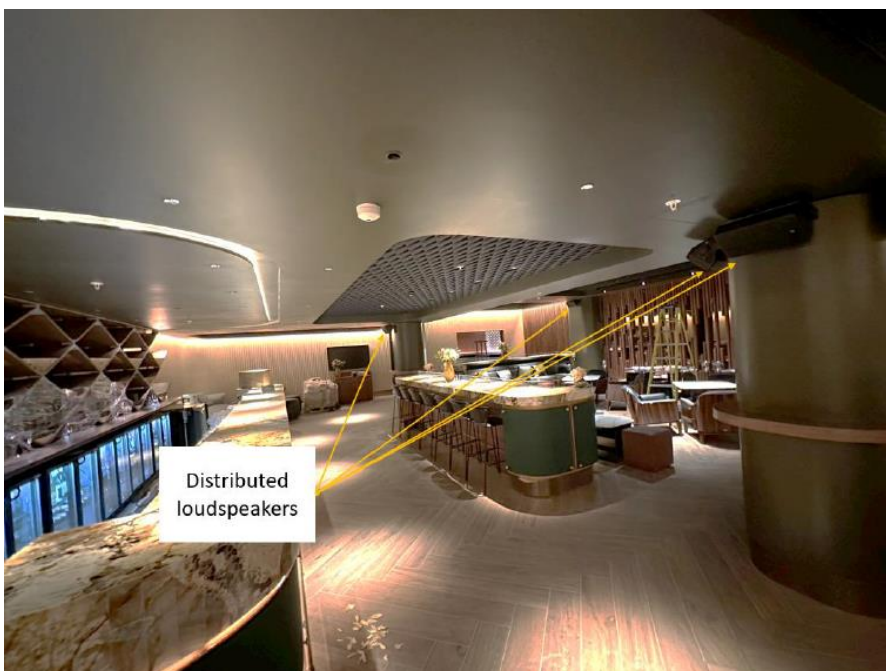
B2. Decibel Club



B3. Bentley Record Bar



B4. Backstage Bar



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