From: **Anthony Horne** <[redacted]>
Date: Thu, 26 Mar 2020 at 11:28
Subject: FW: 244535AM2 Assembly New premises application
To: [redacted]>
Cc: Premises Licensing

Hi Ashia – thank you for the e-mail below. This response is being copied in to all objectors whose e-mail details I hold (namely all bar 2).

I have now taken instructions from my clients, and would advise as follows:-

1. If the new Premises Licence is granted, then the contents of the attached Acoustic Report will be incorporated into the building works;

2. The use of the outside area will cease at 22:00 – with all moveable furniture cleared away by that time;

3. Only smokers will be allowed outside after that time;

4. The hours for licensable activities are to be reduced to 23:15 on Sundays-Thursdays (the premises closing by 23:30) and 00:15 on Fridays & Saturdays (the premises closing by 00:30).

Please let me know if agreement can be reached, thereby obviating the need for a formal Hearing.

Keep safe.

Anthony Horne (Director)

[redacted]

MZA ACOUSTICS

POP CITY, BARBIROLLI SQUARE

Discharge of Condition 6

Document History

Rev	Date	Comment	Author	Checked
P01	May 2020	Draft for comment	RC	GH

Contents

1. INTRODUCTION

MZA Acoustics has been appointed by AEW to undertake an assessment of noise impact of a proposed development upon nearby noise sensitive receptors. The assessment is in place to discharge a planning condition relating to noise emissions from the Site, with the impacts measured at nearby noise sensitive premises.

An environmental noise survey has been undertaken to determine prevailing background sound levels in the surrounding area which have been used as the basis of the assessment. Furthermore, a study of the prevailing sound insulation performance of the façade has been undertaken. Using the results of the acoustic testing, and the guidance provided by the Local Authority and other relevant guidance documents, the impact of the proposed development has been determined. Noise mitigation measures have been proposed where necessary in order to satisfy the requirements of the Local Authority in relation to pre-construction noise conditions.

This report occasionally employs technical terminology. In order to assist the reader, a glossary of terms is presented in Appendix A.

2. SITE DESCRIPTION

The site is located in Manchester city centre at 100 Barbirolli Square, M2 3AB. The development Site is an existing basement level unit that sits below Barbirolli Square, which faces onto The Bridgewater Hall. The Site is bound by the upper floors of the 100 Barbirolli Square office building to the east, Chepstow House residential properties to the south, The Bridgewater Hall to the west and Handlesbanken Manchester HQ to the north.

The nearest residential property is Chepstow House which is located approximately 20m to the south of the Site. Figure 1 presents the site in the context of its surroundings. The site itself has been highlighted in the figure.

Figure 1 – Site location in the context of the area. Nearest residential receptor shown also

The sound climate at the Site is generally dominated by water noise from the Bridgewater Hall Basin which sits immediately in front of the Site. A water feature is located within the basin which runs throughout the daytime and night-time. Further to this water feature, noise road traffic and tram traffic noise also feature.

2.1 Development Proposals

The development proposals involve the refurbishment of the space into a commercial unit. The unit is understood to be predominantly a kitchen and dining space with occasional use as a function hall. The front elevation which faces onto the Bridgewater Basin will be refurbished to feature newly installed access doors and glazed areas.

3. GUIDANCE AND CRITERIA

3.1 BS 7445-2:1991 'Description and Measurement of Environmental Noise'

BS 7445-2:1991 *'Description and Measurement of Environmental Noise - Part 2: Guide to the acquisition of data pertinent to land use'* defines parameters, procedures and instrumentation required for noise measurement and analysis. Accordingly, together with associated guidance within the documents below, this Standard has been used to ensure the survey and data are fit for purpose.

3.2 BS 4142:2014 'Method for Rating and Assessing Industrial & Commercial Sound'

BS 4142 is the generally adopted method for assessing plant noise emissions affecting residential areas, and is specifically referenced as the assessment methodology in POL05 of BREEAM 2011 and is also specified by the majority of local authorities for such instances commercial & industrial sound affecting residential properties.

The BS 4142 Standard describes methods for rating and assessing the following:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train movements on or around an industrial and/or commercial site.

The methods use outdoor sound levels to assess the likely effects of sound at receptor locations specifically used for residential purposes upon which the sound is incident.

If appropriate, the specific sound level of the source ($L_{Aeq,T}$) is corrected, by the application of one or more corrections for acoustic features such as tonal qualities and/or distinct impulses, to give a 'rating' level ($L_{Ar,Tr}$).The Standard effectively compares and rates the difference between the rating level of the specific sound and the typical background sound level ($L_{A90,T}$) in the absence of the specific sound.

The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background sound level at the time(s) the source in question operates or is proposed to operate in the future.

Comparing the rating level with the background sound level, BS 4142 states:

- "Typically, the greater this difference, the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background

sound level, this is an indication of the specific sound source having a low impact, depending on the context."

3.3 Manchester City Council Planning Condition

A decision notice has been granted for the development (decision notice 125539/FO/2019), based on a number of planning conditions. One of these (Condition 6) relates to noise emissions from site. Note that the condition has a design element, which is addressed in this report, and an element to be addressed upon completion of the scheme. The condition is as follows:

> *"6) The premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.*
>
> *Where entertainment noise is proposed the LAeq (entertainment noise) shall be controlled to 10dB below the LA90 (without entertainment noise) in each octave band at the facade of the nearest noise sensitive location, and internal noise levels at structurally adjoined residential properties in the 63HZ and 125Hz octave frequency bands shall be controlled so as not to exceed (in habitable rooms) 47dB and 41dB, respectively.*
>
> *Before the Class A3 use hereby approved commences, the premises shall be acoustically insulated and treated to limit the break out of noise in accordance with a noise study of the premises and a scheme of acoustic treatment that has been submitted to and approved in writing by the City Council as Local Planning Authority.*
>
> *The scheme proposed shall normally include measures such as acoustic lobbies at access and egress points of the premises, acoustic treatment of the building structure, sound limiters linked to sound amplification equipment and specified maximum internal noise levels. Any scheme approved in discharge of this condition shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as Local Planning Authority.*
>
> *Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that acceptable criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.*
>
> *Reason - To safeguard the amenities of the occupiers of the building and occupiers of nearby properties."*

It should be noted that there are no structurally adjoining residential properties and as such the requirement for the 63HZ and 125Hz octave frequency bands to be controlled to be below 47dB and 41dB, respectively is not applicable here.

4. NOISE MEASUREMENTS

As part of the assessment process, two types of noise survey were undertaken. The first was a survey of environmental noise levels at positions considered to be representative of the conditions at the nearest sensitive receptors to the development, while the second survey was to determine the existing level of noise break-out from the premises in order to identify sound leakage paths such that appropriate mitigation works can be determined. Both surveys are discussed in turn below.

4.1 Environmental Sound Survey

4.2 Description

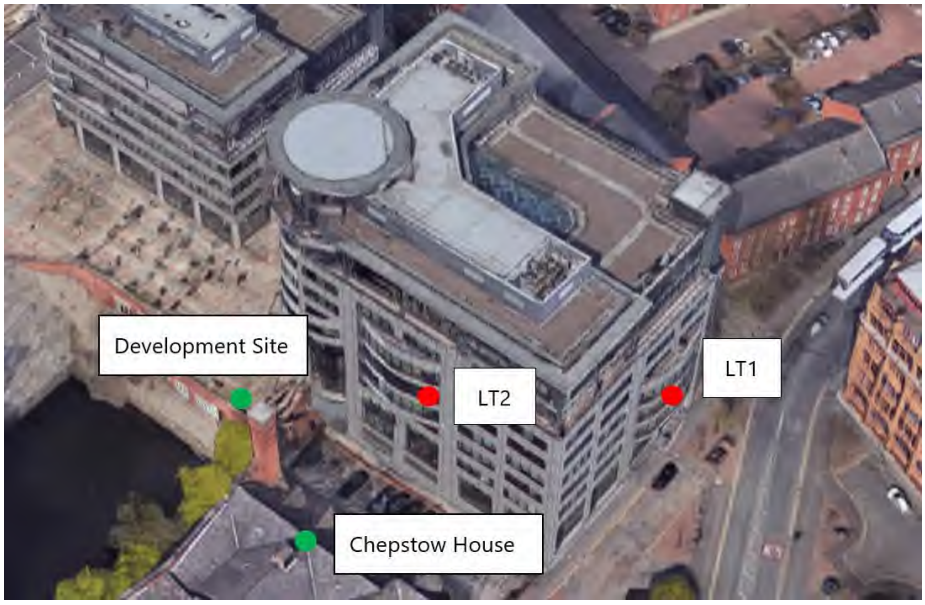
Baseline environmental sound monitoring was undertaken at the site on Wednesday Monday 9th to Tuesday 10th July 2018 in order to quantify the existing prevailing background sound levels close to the existing noise sensitive receptors to the proposed development site. The survey commenced at approximately 14:00 hours on the 9th July and concluded at approximately 12:30 on the 10th July. The survey was undertaken initially for the use in the assessment associated with the office phase of the 100 Barbirolli Square development. The noise survey was undertaken by Graham Hornby of MZA Acoustics (Director).

This survey consisted of two unattended measurement locations during critical daytime and night time periods. A description of the measurement locations is detailed below, with the locations highlighted on the plan in Figure 2.

Four long-term fixed and short-term attended noise measurement positions were used during the survey, however, only two are considered relevant to this assessment and as such are the only two that have been included in this report.

- LT1 – Long Term (24-hour measurement) on the 4th Floor balcony on the Cheptsow Street elevation. The noise climate at this location was dominated by road traffic noise.
- LT2 – Long Term (24-hour measurement) on the 6th Floor balcony overlooking Cheptsow House and the canal The noise climate at this location was dominated by road traffic noise.

Figure 2 Site noise measurement locations and source/receiver locations (courtesy of Google Maps)



4.3 Results

Table 1 presents the results of the noise survey across the four measurement locations.

Table 1 Site noise survey results summary

Measurement Position	Location	Measurement Period	Measured Daytime Noise Levels		Measured Night Time Noise Levels	
			dB $L_{Aeq,T}$	dB $L_{A90,T}$	dB $L_{Aeq,T}$	dB $L_{A90,T}$
LT1	Balcony overlooking Chepstow Street	14:00 09/07/18 – 12:30 10/07/18	62	55	57	49
LT2	Balcony overlooking Chepstow House	14:30 09/07/18 – 12:00 10/07/18	60	58	51	43

LT2 is considered to be representative of the properties most exposed to noise emissions from the development and as such will be used as the basis of the assessment.

4.4 Equipment

Table 2 details the equipment used during the survey. The sound level meters were field-calibrated before and after measurements using the acoustic calibrator shown. No significant drift in calibration level was recorded (<0.1 dB). The calibrator and sound level meters have been calibrated by a UKAS accredited calibration laboratory within the past year and in the past two years respectively.

Table 2 Measurement Equipment

Measurement Position	Equipment	Model Type	Serial Number
LT1	Sound Level Meter	SVANTEK Svan 971	55531
LT2	Sound Level Meter	SVANTEK Svan 971	55548

Weather conditions throughout the survey were considered conducive to the measurement of environmental noise, being dry throughout with low winds, generally below 10km/h with occasional gusts. Temperatures ranged from 13 to 25 degrees Celsius.

4.5 Noise Breakout from Premises

A second noise survey was undertaken by MZA Acoustics on 2nd March 2020 to determine the level of sound break-out from the building and to estimate the sound insulation performance of existing openings such that any upgrade works could be specified.

In order to undertake the above, one speaker was located within the proposed development. A pink noise source was used to create an internal reverberant noise level of sufficient magnitude so as to be clearly measured outside, above the prevailing background noise. As

such an internal reverberant sound pressure level of approximately 100 dB(A) was produced. Three separate sound source positions were used inside of the building.

In addition, measurements of the noise break-out levels were undertaken immediately outside of the development, at the location of the proposed outdoor seating area. Three receiver positions were used here, one for each source measurement position. These measurements were used to determine the level difference (D) in each octave band across different points of the façade. One measurement was taken with doors open to determine the sound insulation offered by the solid elements only.

Figure 3 presents external measurement positions. The internal measurement positions were located immediately on the inside of the doors relative to the outdoor positions. Internal measurement were taken 1.5m from the internal façade adjacent to the labelled external measurement position. External measurements were made at 1m from the external façade at the positions identified in the figures below.

Background sound levels were measured at 1.5m from the building façade in the absence of any internal noise source. The background sound level was measured to be 67 dB $L_{Aeq,30s}$. This is more than 10 dB lower than the lowest measured external sound level with the source operational; hence background levels will have less than 1 dB of influence on the measured external levels.

4.6 Equipment

Table 3 details the equipment used during the survey. The sound level meters were field-calibrated before and after measurements using the acoustic calibrator shown. No significant drift in calibration level was recorded (<0.1 dB). The calibrator and sound level meters have been calibrated by a UKAS accredited calibration laboratory within the past year and in the past two years respectively.

Table 3 Measurement Equipment

Component	Model	Serial Number	Calibration Test Date	Calibration Due Date
Sound Level Meter	SVAN 971	80342	26/03/2018	26/03/2020
Microphone	ACO 7052E	59531		
Preamp	SV18	71576		
Calibrator	01dB-Stell Cal 21	34675335	28/08/2018	28/08/2019

Figure 3 – Noise break-out measurement positions

4.7 Results

The results of the noise survey are provided in Tables 4 to 7 below.

Table 4 – Position 1 noise break-out measurement, doors closed

Description	Measured broadband level		Measured octave band level, dB							
	$L_{Aeq,T}$	L_{AFmax}	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Internal	102	101	103	98	104	99	99	99	92	89
External	77	76	78	81	83	78	73	72	67	65
Difference (D)	25	25	25	17	21	21	27	27	25	24

Table 5 – Position 2 noise break-out measurement, doors closed

Description	Measured broadband level		Measured octave band level, dB							
	$L_{Aeq,T}$	L_{AFmax}	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Internal	105	104	107	98	104	100	101	102	96	93
External	79	78	80	80	85	78	74	74	70	68
Difference (D)	26	26	27	18	20	23	27	28	25	26

Table 6 – Position 3 noise break-out measurement, doors closed

Description	Measured broadband level		Measured octave band level, dB							
	$L_{Aeq,T}$	L_{AFmax}	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Internal	103	95	102	97	98	98	94	91	90	103
External	83	80	88	81	79	77	74	72	71	83
Difference (D)	20	15	15	16	19	21	20	19	20	20

Table 7 – Position 3 noise break-out measurement, doors open

Location	Measured broadband level		Measured octave band level, dB							
	$L_{Aeq,T}$	L_{AFmax}	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Internal	103	95	102	97	98	98	94	91	90	103
External, Doors Open	92	86	94	90	88	86	81	78	78	92
Difference (D)	11	9	8	7	10	12	13	13	12	11

5. ASESSMENT

5.1 Acoustic Design Criteria

Based on the requirements outlined in condition 6 of the planning consent the following criteria are to be applied to the scheme:

1. Entertainment noise (dB L_{Aeq}) shall be controlled to 10 dB below the background noise level (dB L_{A90}) in each octave band at the facade of the nearest noise sensitive location (Chepstow House)
2. Internal noise levels at structurally adjoined residential properties shall be controlled so as not to exceed 47dB in the 63 Hz octave band, and 41dB in the 63HZ and 125Hz octave frequency band, when measured in habitable rooms

Based on the requirements of criterion 1 above and the background noise levels measured at the Site. As there are no structurally adjoining residential properties criterion 2 above can be dismissed with no need for assessment.

Based on criteria 1 above, Table 8 and Table 9 presents the acoustic design criteria applicable at the façade of the receptor (Chestow House) and at the façade of the development. Note that Table 8 presents daytime levels (07:00 to 23:00) and Table 9 presents night time levels (23:00 to 07:00).

Table 8 – Noise level criteria, daytime (07:00 – 23:00hrs)

Description	Measured octave band level, dB								Total dBA
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Background noise level at receptor	62	63	56	54	55	49	41	33	58
Criterion at receptor (background - 10 dB)	52	53	46	44	45	39	31	23	48
Criterion at 1m from façade of development (20m from receptor)	65	66	59	57	58	52	44	36	61

Table 9 – Noise level criteria, night time (23:00 – 07:00hrs)

Description	Measured octave band level, dB								Total dBA
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	
Background noise level at receptor	47	50	42	39	40	34	26	17	43
Criterion at receptor (background - 10 dB)	37	40	32	29	30	24	16	7	33
Criterion at 1m from façade of development (20m from receptor)	50	53	45	42	43	37	29	20	46

5.2 Existing Façade Sound Insulation

The façade currently offers between 19 and 26 dB of sound insulation with doors closed and approximately 11 dB of sound insulation with doors open. This sound insulation offered with doors closed is lower than what an external door typically offers and is most-likely due to poorly sealed door junctions and a louvred opening above the doors. Based on these findings, mitigation measures will likely be required to uplift the performance of the façade.

Figure 4 presents images from the site showing the gaps around door frames and louvred openings.

Figure 4 -

Using MZA Acoustics' noise data library we can determine external levels based on typical internal activities. The data shown presents three scenarios, each of which are considered to present high (worst case) noise levels.

Table 10 – Example of noise levels of entertainment venues

Description	Measured octave band level, dB								Total dBA
	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
Restaurant w/ background music	-	73	80	78	77	76	76	76	83
Bar area quiet	72	87	90	89	85	82	75	70	87
Bar area loud	75	91	95	95	93	89	82	77	94

Based on the above and the sound insulation performance of the existing façade we can expect external noise levels of approximately 60 to 70 dBA at 1m from the façade of the development, which is in exceedance of both daytime and night time criteria. As such we proposed that an improvement in the existing façade performance is tagetted to allow for the deisred operation of the space to correlate with the requirements of the local authority.

5.3 Sound Insulation requirements

Due to external noise levels being the limiting factor with regards to Condition 6, the sound insulating performance of the façade will determine the maximum permitted internal level. As the façade is to feature a significant amount of glazing, as well as access/emergency doors, the sound insulation peformance will be somewhat limited compared to a fully sealed façade. This section will look at external noise level criteria and provide sound sinulation performance requirements in octave bands that aim to satisfy the requirements of MCC, in line with Condition 6.

It is understood that the venue is proposed to be used primarily as a bar and dining space. As such we have presented below the sound insulation requirements to reflect the internal noise level presented in Table 10 against the external noise level requirements of the Council presented in Table 8 and Table 9. Note that these levels are considered to be a worst-case and levels will likely be lower for typical use of the development.

Table 11 – Façade requirement for use, daytime

Description	Octave band level, dB							
	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Restaurant w/ background music	-	73	80	78	77	76	76	76
Bar area quiet	72	87	90	89	85	82	75	70
Bar area loud	75	91	95	95	93	89	82	77
Daytime criterion at 1m from façade of development	68	65	66	59	57	58	52	44
Sound insulation requirement of façade [1]	7	26	29	36	36	31	30	33
[1] Based on the maximum requirement in each octave band								

Table 12 - Façade requirement for use, night time

Description	Octave band level, dB							
	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Restaurant w/ background music	-	73	80	78	77	76	76	76
Bar area quiet	72	87	90	89	85	82	75	70
Bar area loud	75	91	95	95	93	89	82	77
Night time criterion at 1m from façade of development	52	50	53	45	42	43	37	29
Sound insulation requirement of façade [1]	23	41	42	50	51	46	45	48
[1] Based on the maximum requirement in each octave band								

Table 11 and Table 12 show the sound insulation requirements of the façade in octave bands for daytime and for night time with regards to internal noise for bar/restaurant activity. Note that these are based on library noise data and internal levels may differ in

practice. Room factors such as geometry and reverberation time will impact the spectra and ultimately alter the noise level in octave bands. As such it is proposed that the maximum permitted internal levels are revisited once the post-completion site testing has been undertaken, in line with the requirements of Condition 6.

If the external façade achieves this performance, then the external noise criteria required by MCC will be achieved. Note that the internal levels used here are expected to be worst-case levels for a bar/restaurant development and in practice, levels will typically be lower. However, as these internal levels may be possible during operation, and typical underperformance of products in-situ when compared to the laboratory tested performance, it is considered prudent to design to these upper levels.

The exact design of any such façade elements depends upon their construction and their location in relation to sound sources within the development. The design team should keep in close contact with MZA Acoustics to review such design elements to ensure their compliance with the sound insulation requirements.

It is advised that if amplified music is proposed to be played during the night time (23:00-07:00), then a sound limiter should be applied to any PA equipment that limits the output so that the noise criteria is not exceeded. This exact level will be determined by the sound insulation offered by the façade. Note that the use of a limiter will not remove the requirement for significant sound insulation from the façade but will provide operator control to ensure that the façade design remains effective.

5.4 Access to outdoor area

In the case that patrons have access to the outdoor area it is recommended that access to such areas from the inside is via an acoustic lobby. Such a lobby should be designed as follows:

- An R_w 35dB acoustically rated door be installed in the external façade. Due care must be taken to ensure the frame is sealed tightly to the door opening. Any small voids to be sealed with non-setting acoustic mastic. Any gaps larger than 10mm to be packed with a compressible filler (such as low density mineral wool to the full depth of the void), sealed at the outer edge with non-setting acoustic mastic and a metal angle (such as British Gypsum GA2 or GA4) used to cover the junction between the frame and the reveal.
- An internal lobby is created to completely enclose the external door opening, with the walls and ceiling of the lobby construction to achieve a minimum rating of R_w 45 dB. This can be achieved using a minimum 70mm stud lined each side with one layer of 15mm dense plasterboard (e.g. SoundBloc) and 50mm mineral wool quilt with a minimum density of 10kg/m3 (e.g. APR1200) in the cavity (secured to avoid sagging etc). It is important the construction noted is applied to the roof of the lobby as well as the walls.
- A new R_w 30dB acoustically rated door be installed in the new lobby. Due care must be taken to ensure the frame is sealed tightly to the door opening.
- Acoustically absorbent (Class A) soffit to the ceiling of the lobby
- It is recommended that measures are in place to avoid both sets of doors being opened whilst music is being played. This could be means of either a management procedure.

The manufacturer or supplier of the acoustic door set(s) shall guarantee the specified SRI and ensure that the method of installation does not detract from the guaranteed performance. Any failure to meet the specification because of faulty design, manufacture or installation, will result in the manufacturer or supplier being held liable for remedial or replacement costs including consequential liability.

Details of acoustic door constructions are as follows

- The acoustic door set(s) shall be supplied complete with all the seals and frames, and with furniture as specified by the Architect.
- The door furniture should be designed and installed so as to ensure that the seals are acoustically effective over the whole periphery of the door.
- It is recommended that the door set(s) should be of steel construction with double neoprene/rubber compression, or knife edge, seals to head, jambs and threshold.
- Double leaves should incorporate a central jamb or overlapping leaves to ensure a good seal at the middle joint.
- Wipe seals will not be permitted at thresholds; doors must be fitted with a raised threshold or rising butt hinges with a compression seal.
- Any deviations from the above specification must be agreed by and confirmed in writing to MZA Acoustics.

5.5 Outdoor Noise

If patrons can gain access to the outdoor area then there is the potential for noise from their activity to disturb residents at nearby properties, particularly at night.

The noise levels presented in Table 8 and Table 9 are the maximum noise levels permitted outdoors during the daytime and the night time. If there is to be outdoor activity then these levels cannot be exceeded.

If there is to be significant activity in this area during the night time (i.e. smoking area during a live music event) then mitigation measures will likely be required. This could be controlled via management of the use of the space, limiting the number of people who can use it at any one time, or by including an acoustically screened area. However, it should be noted that activity in this area will likely need to be limited at night time in order to protect the nearby residents at Chepstow House from noise disturbance.

5.6 Completion Testing

As a requirement of Condition 6 a series of acoustic tests are to be undertaken upon completion of the building works. As such the results of the testing will ultimately determine the maximum operational internal noise levels. Whilst the design considerations here will allow for a high level of acoustic performance from the development there are ultimately a number of factors that can impact this performance in-situ. Workmanship is of utmost importance here to ensure that the acoustic integrity of the façade is maintained and that the permissible operational noise levels can allow for reasonable use for the tenants and for suitable living conditions for nearby residents and noise sensitive receptors.

6. CONCLUSIONS

MZA Acoustics has been appointed by AEW to undertake an assessment of noise impact of a proposed development upon noise sensitive nearby receptors. The assessment is in place to discharge a planning condition relating to noise emissions from the Site, with the impacts measured at nearby noise sensitive premises.

An environmental noise survey has been undertaken to determine prevailing background sound levels in the surrounding area which have been used as the basis of the assessment. Furthermore, a study of the prevailing sound insulation performance of the façade has been undertaken.

The development proposals involve the refurbishment of the space into a commercial unit. The unit is understood to be predominantly and kitchen and dining space with occasional use as a function hall.

Based on the results of the noise surveys external noise criteria have been applied at the façade of the nearest residential receptor (Chepstow House) and immediately outside of the façade of the development. These criteria have been based upon the requirements outlined in Manchester City Council decision notice 125539/FO/2019, Condition 6.

Sound insulation requirements of the external façade have been provided for daytime and night time based on three internal noise level spectra. The façade should be designed to target the sound insulation performances presented in Table 11 and Table 12. Furthermore, advice has been offered with regards to noise limiters on PA systems and with regards to noise control at access points to outdoor areas.

As a requirement of Condition 6 a series of acoustic tests are to be undertaken upon completion of the building works. As such the results of the testing will ultimately determine the maximum operational internal noise levels. Whilst the design considerations here will allow for a high level of acoustic performance from the development there are ultimately a number of factors that can impact this performance in-situ. Workmanship is of utmost importance here to ensure that the acoustic integrity of the façade is maintained and that the permissible operational noise levels can allow for reasonable use for the tenants and for suitable living conditions for nearby residents and noise sensitive receptors.

Subject to the above it is considered that the venue can operate as planned whilst satisfying the requirements of condition 6 of the planning decision.

Appendices

Appendix A – Acoustic Terminology

NOISE

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc, according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

An indication of the range of sound levels commonly found in the environment is given in the following table.

Typical sound levels found in the environment

SOUND LEVEL	LOCATION
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft on take off
140 dB(A)	Threshold of Pain

TERMINOLOGY RELATING TO NOISE

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20μPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1 / s_2)$. 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 20μPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
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.
$L_{eq,T}$	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.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m
Facade	At a distance of 1m in front of a large sound reflecting object such as a building façade.
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.
R_w	A single number quantity that characterises the airborne sound insulation of a material or building element in the laboratory. See BS EN ISO 717-1:1997
SRI	Sound Reduction Index. A quantity, measured in a laboratory, which characterises the sound insulating properties of a material or building element in a stated frequency band. See BS EN ISO 140-3:1995
Reverberation	The persistence of sound in a space after a sound source has been stopped.

Appendix B - Limitations

Limitations to This Report

This Report has been prepared by MZA Acoustics Limited for the project specified and should not be used (in whole or part) and relied upon for any other project or body without the written authorisation of MZA Acoustics Ltd.

MZA Acoustics Ltd accepts no responsibility or liability for the consequences of this document if it is used for a purpose other than that for which it was commissioned. Should any person(s) wish to use or rely upon this Report for any other purpose, they must seek written authority to do so from MZA Acoustics Ltd and agree to indemnify the same for any and all loss or damage resulting there from. MZA Acoustics Ltd also accepts no responsibility or liability to any other party other than the person / organisation who commissioned this Report.

The findings and opinions expressed are relevant to the dates of the site works and should not be relied upon to represent conditions at substantially later / other dates. Opinions included therein are based on information gathered during the study and from our experience. If additional information becomes available which may affect our comments, conclusions or recommendations MZA Acoustics Ltd reserve the right to review the information, reassess any new potential concerns and modify our opinions accordingly.

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