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PROJECT TECHNICAL MEMORANDUM

JOB TITLE : 58 Mosley Street
REF : HT:30387/PTM1
DATE : 18 December 2023
FROM : James Hardacre
ISSUED TO : Design Team

RE: PLANNING CONDITION 13a DISCHARGE LETTER 58 MOSLEY STREET

1.0 Overview

The development at 58 Mosley Street, has been granted planning permission subject to several conditions, including 13a, which is as follows:

“Condition 13 a) Prior to the commencement of the construction of the rooftop extension hereby approved, a scheme shall be submitted to limit the breakout of noise from the use hereby approved in accordance a noise study of the premises and a scheme of acoustic treatment, including measurements that has been submitted to and approved in writing by the City Council as local planning authority. The scheme shall then be implemented in full before the use hereby approved commences.”

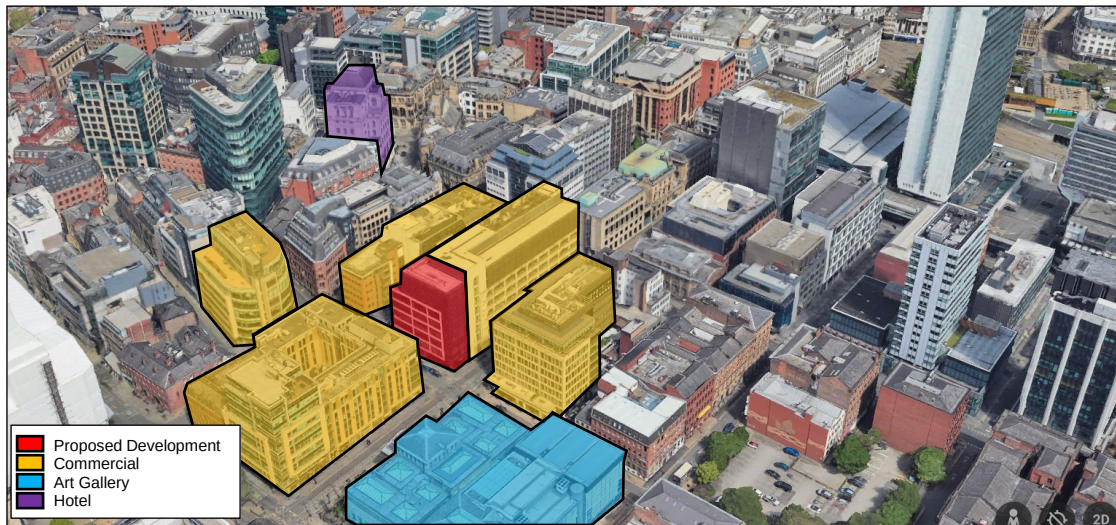
This intention of this letter is to assist in the discharge of the above condition by presenting an acoustic review of the progressed design solutions against noise limits set out in the Hann Tucker Noise Impact Assessment Report (30387/NIA1) submitted with the planning application.

2.0 Site Description

The figure below highlights the site in question, which is bounded by Mosley Street, Booth Street, and West Mosley Street, with a tram line running along Mosley Street. The site is predominantly surrounded by commercial and entertainment establishments, with the closest commercial structure situated roughly 15m southeast. An art gallery is also present, located approximately 25m to the south. The nearest residential building, which is well shielded from the site, is around 130m to the northwest.

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A UKAS Accredited testing laboratory No.4083 for Sound Insulation and Air Tightness Testing; ISO 9001 Accredited
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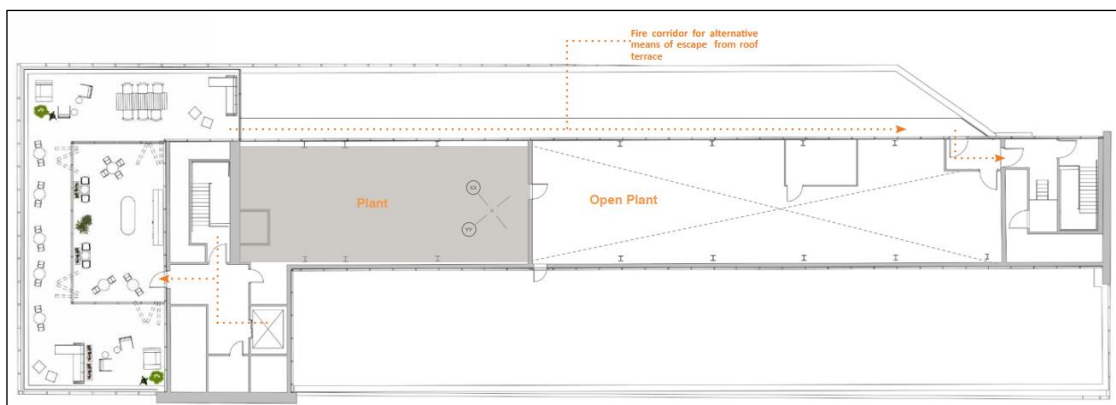
Site Location Map (Imagery c/o Google Earth 2023)

3.0 Project Proposals

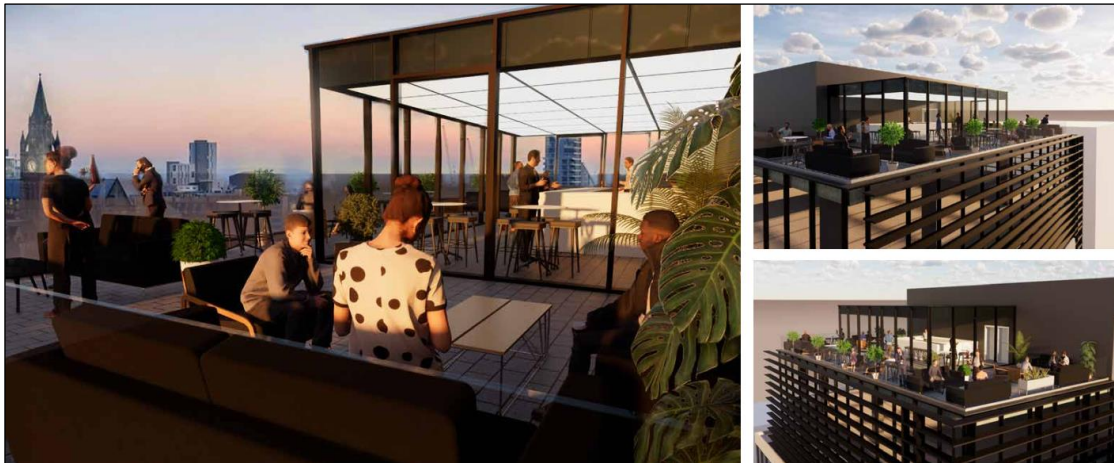
The development plan involves the construction of a new rooftop terrace on the eighth floor, located on the southern side of the premises, accessible via an extension on the same level. Given the anticipated usage of the space, the primary concern is the potential noise pollution emanating from the terrace activities, which could affect nearby office spaces. However, the closest residential area is more than 125 meters away, reducing the potential for impact on residential noise levels.

The concept for this rooftop terrace involves the establishment of a sheltered pavilion space that can be utilized in all weather conditions. This space can also be transformed into an open-air lounge and pavilion area when desired.

Proposed building plans and a CGI are provided in the figures overleaf for context.



Proposed Plan of Roof Terrace Development



Indicative 3D View of Proposed Roof Terrace

4.0 Baseline Noise Survey

4.1 Procedure

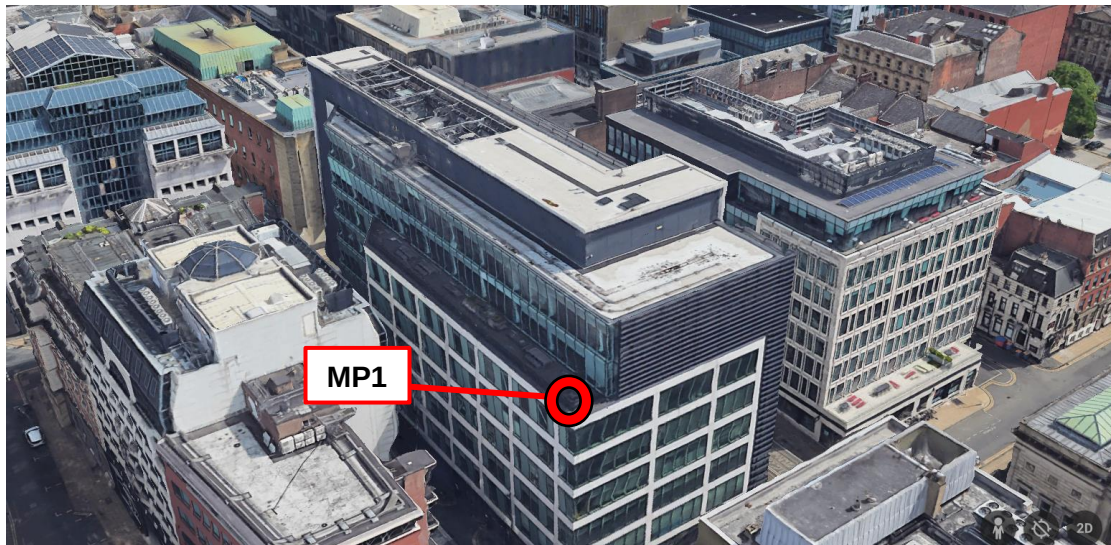
Unattended noise monitoring was undertaken on site over a 5-day period to establish full daytime and night-time noise levels over a typical weekday and weekend period. The monitoring was carried out between 15:00 on Wednesday 7 December 2022 and 14:30 on Monday 12 December 2022, with equipment set up to record broadband and spectral (octave band) sound pressure levels over discrete 15-minute periods.

The surveys were performed by Alex Jang BEng(Hons). All measurements were collated in general accordance with BS 7445-1:2003 *Description and Measurement of Environmental Noise*.

4.2 Measurement Positions

The measurement positions were as described and illustrated below.

Position	Type	Description
1	Unattended	To the east side of the site, on the existing 6 th floor terrace space, approximately 25m above ground level. Attached to a pole on the terrace railing, approximately 4m away from the façade. This is considered to be a free-field level.



Measurement Position (© Google Earth)

4.3 Weather Conditions

For the unattended survey between 15:00 on Wednesday 7 December 2022 and 14:30 on Monday 12 December 2022, local weather reports indicated no periods of prolonged and/or heavy rainfall. Temperatures ranged from -6°C (night) to 3°C (day) and wind speeds generally less than 5 m/s. During our time on site, skies were clear, wind conditions were calm and from a northerly direction and road surfaces were dry.

Weather conditions were deemed suitable for obtaining representative noise readings.

4.4 Instrumentation

The instrumentation used during the survey is presented in the table below.

Position	Description	Manufacturer	Type	Serial Number	Last Calibration
1	Type 1 Data Logging Sound Level Meter	Larson Davis	824	4047	22/05/2022*
1	Type 1 Calibrator	Larson Davis	Call200	3083	06/05/2021*

*Calibration dates provided are those relevant to the time the survey was undertaken, not the most up-to-date.

The sound level meter was housed in a weatherproof case with the microphone connected via an extension cable. The sound level meter was fitted with a windshield.

The sound level meter was calibrated prior to and on completion of the surveys. No significant deviations occurred (not more than 0.3 dB).



4.5 Measurement Results

4.5.1 Unattended Survey

The results of the unattended survey have been plotted on Time History Graph 30387/TH1 enclosed. This graph presents the 15-minute A-weighted (dBA) L_{90} , L_{eq} and L_{max} free-field sound pressure levels at Position MP1 throughout the duration of the survey.

A summary of the results, as used to inform subsequent assessments against current guidelines, is presented in the table below. The L_{A90} values presented are the 'representative lowest' sound levels determined through statistical analysis of the 15-minute readings, in line with BS 4142. L_{Amax} values are the '15th highest' 2-minute value. All results are presented as free-field levels.

Position	Daytime (07:00 – 23:00 hrs)		Night-time (23:00 – 07:00 hrs)		
	$L_{Aeq,16hr}$	L_{A90}	$L_{Aeq,8hr}$	L_{A90}	Typical Highest L_{Amax}
MP1	60	54	59	53	78
1 External L_{Amax} noise level not normally exceeded more than 10 times a night. This is considered to be the ventilation design case.					

4.6 Discussion of Noise Climate

Due to the nature of the survey, i.e., unattended, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However, at the beginning and end of the survey period the noise climate was noted to be dominated by road traffic noise, primarily from Mosley Street and Booth Street.

5.0 Noise Emission Limits

5.1 Residential Receptors

On the basis of Manchester City Council's guidance, and the results of the environmental noise survey, we propose that the following noise emission criteria be achieved at 1 metre from the nearest noise residential sensitive receptor, presented as free-field limits.

Time Period	Music Noise Emission Limits (dBA) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Daytime (07:00 – 23:00)	54	51	52	50	49	44	36
Night-time (23:00 – 07:00)	49	46	49	45	43	38	29



5.2 Office Receptors

MCC stipulate amplified noise egress criteria for residential receptors should not exceed 5 dB below the background noise level, however, there is no specific requirements to control noise egress to office developments. As such, to minimise the risk of disturbance to adjacent office developments we propose that the cumulative noise level as a result of noise egress from the development should not exceed 5 dB below the internal noise level within the office.

All office developments in the area have sealed facades. As such, assuming an internal noise level of NR 35 and the sound insulation performance of a typical thermal double-glazed window we have established amplified noise egress limits at the most affected office receptor.

Based on the above we propose that the following noise emission criteria be achieved at 1 metre from the nearest noise office receptor, presented as free-field limits. Night-time limits for office receptors have not been provided as it is assumed that the offices would be closed during the night and therefore not sensitive to noise.

Time Period	Music Noise Emission Limits (dBA) at Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Daytime (07:00 – 23:00)	67	56	52	51	57	50	52

6.0 Assessment

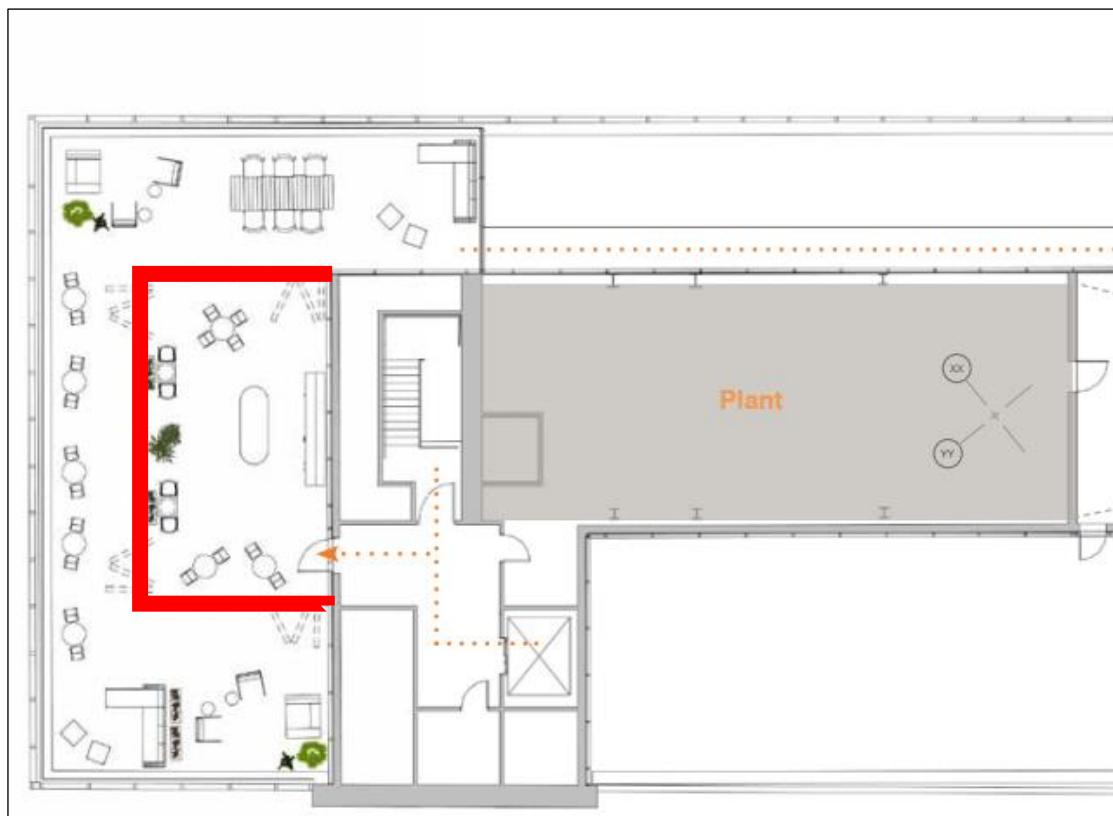
6.1 Proposed Glazing Specifications

Guardian Glass (preferred supplier) and NJL Consulting have provided glazing specifications for the proposed glazing to the pavilion/roof terrace area. The glazing configuration and corresponding sound insulation performances are provided in the following table:

Configuration (mm)	Sound Reduction Index R (dB) at Octave Band Centre Frequencies (Hz)							
	63	125	250	500	1000	2000	4000	R _w + C _{tr}
6/18/6/18/6	18*	20	33	39	50	37	61	32

*Extrapolated performance.

The extent of the proposed glazing is highlighted in red below:



6.2 Proposed Roof Specification

The exact specification of the new terrace roof is not known at the time of writing, however based on the information provided it is expected to comprise of the following:

- 180mm Sikatherm PIR insulation.
- Metal Profile deck.
- 12.5mm plasterboard MF ceiling.

The predicted sound insulation performance is as provided in the following table:

Sound Reduction Index R (dB) for glazing at Octave Band Centre Frequencies (Hz)							
63	125	250	500	1000	2000	4000	R _w + C _{tr}
16	22	38	51	54	64	67	36



6.3 Predicted Composite Performance

To conduct an evaluation of noise egress from the terrace pavilion area, assuming all windows and doors are shut, it is necessary to determine a composite sound insulation performance. This will evaluate the combined effect of the glazing and the roof. The composite sound insulation performance has been calculated using the most recent specifications for dimensions and materials. The results are provided in the subsequent table:

Composite Sound Reduction Index R (dB) at Octave Band Centre Frequencies (Hz)							
63	125	250	500	1000	2000	4000	R _w + C _{tr}
17	21	35	41	51	40	63	34

6.4 Predicted Internal Noise Levels

To inform our assessment of the spaces, we have drawn upon typical noise levels within similar spaces that incorporate music. These typical highest 1-hour noise levels are presented below for a scenario where the windows are closed and a scenario where the windows are open.

Notwithstanding the above, based on liaison with the client, the anticipated noise sources are primarily background music at a sensible level during “company networking events”. However, it’s important to note that the specific noise levels for these sources may differ from those provided below. Furthermore, events are likely to be infrequent, the noise levels from this venue are unlikely to be directly comparable to those of a typical bar.

Description	Reverberant Noise Level (dB L _{eq,1hr}) at Octave Band Centre Frequency (Hz)							dBA
	63	125	250	500	1000	2000	4000	
Typical internal noise levels in a bar with background music playing windows closed	71	74	75	75	72	68	63	77
Typical internal noise levels in a bar with background music playing windows open	66	69	70	70	67	63	58	72

As Indicated above, the levels with the windows open are lower than with them closed. This is because the space will be less enclosed and less reverberant. As such, a conservative 5 dB reduction has been applied.



6.5 Assessment (Bi-folding doors all closed)

6.5.1 Residential Receptors

We have assessed noise breakout to the nearest residential receptors located 125m away based on standard industry calculation procedures, the glazing specifications set out in Section 6.1 and the reverberant source noise levels set out in Section 6.2.

The table below provide a summary of the entertainment noise egress calculations for the terrace pavilion with all of the windows closed.

Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Internal noise level (dB L _{eq}) <i>SPL_{in}</i>	71	74	75	75	72	68	63
Composite Sound Reduction of Proposed Glazing, R (dB)	17	21	35	41	51	40	63
Distance & radiating area propagation correction (dB) $10\log_{10}\left(\frac{S}{r^2}\right)$ to 125m	-13	-13	-13	-13	-13	-13	-13
Internal diffuse field to external free-field hemispherical radiation correction (dB) -14	-14	-14	-14	-14	-14	-14	-14
External noise level at nearest receptor (dB L _{eq}) <i>SPL_{out}</i>	27	26	13	7	0	1	0
Night-time egress limits, L _{Aeq} (23:00 – 07:00)	49	46	49	45	43	38	29
Compliance	✓	✓	✓	✓	✓	✓	✓

The above table demonstrates that the noise breakout with the windows closed would be well below the night-time criteria at the nearest residential dwelling.

6.5.2 Office Receptors

The table below provide a summary of the entertainment noise egress calculations for the terrace pavilion with all of the windows closed. As the terrace is at a greater height than all of the surrounding office buildings a 5 dB screening loss has also been included in the calculations.

Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Internal noise level (dB L _{eq}) <i>SPL_{in}</i>	71	74	75	75	72	68	63
Composite Sound Reduction of Proposed Glazing, R (dB)	17	21	35	41	51	40	63



Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Distance & radiating area propagation correction (dB) $10\log_{10}\left(\frac{S}{r^2}\right)$ to 16m	5	5	5	5	5	5	5
Internal diffuse field to external free-field hemispherical radiation correction (dB) -14	-14	-14	-14	-14	-14	-14	-14
Screening Loss (dB)	-5	-5	-5	-5	-5	-5	-5
External noise level at nearest receptor (dB L _{eq}) <i>SPL_{out}</i>	40	39	26	20	7	14	0
Daytime (07:00 – 23:00)	67	56	52	51	57	50	52
Compliance	☑	☑	☑	☑	☑	☑	☑

The above table demonstrates that the noise breakout with the windows closed would be well below the day-time criteria at the nearest office premises.

6.6 Assessment (Bi-folding doors open)

6.6.1 Residential Receptors

The table below provide a summary of the entertainment noise egress calculations for the terrace pavilion with all of the windows open.

Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Internal noise level (dB L _{eq}) <i>SPL_{in}</i>	66	69	70	70	67	63	58
Sound Reduction of Proposed Glazing, R (dB)	0	0	0	0	0	0	0
Distance & radiating area propagation correction (dB) $10\log_{10}\left(\frac{S}{r^2}\right)$ to 125m	-13	-13	-13	-13	-13	-13	-13
Internal diffuse field to external free-field hemispherical radiation correction (dB) -14	-14	-14	-14	-14	-14	-14	-14
Partial Screening Loss (dB)	-5	-5	-5	-5	-5	-5	-5
External noise level at nearest receptor (dB L _{eq}) <i>SPL_{out}</i>	34	37	38	38	35	31	26
Night-time egress limits, L _{Aeq} (23:00 – 07:00)	49	46	49	45	43	38	29
Compliance	☑	☑	☑	☑	☑	☑	☑

The above table demonstrates that the noise breakout with the windows open would be well below the night-time criteria at the nearest residential dwelling.



6.6.2 Office Receptors

The table below provide a summary of the entertainment noise egress calculations for the terrace pavilion with all of the windows open.

Assessment to Residential Receptor	Octave Band Centre Frequency (Hz)						
	63	125	250	500	1000	2000	4000
Internal noise level (dB L _{eq}) <i>SPL_{in}</i>	66	69	70	70	67	63	58
Sound Reduction of Proposed Glazing, R (dB)	0	0	0	0	0	0	0
Distance & radiating area propagation correction (dB) $10\log_{10}\left(\frac{S}{r^2}\right)$ to 16m	5	5	5	5	5	5	5
Internal diffuse field to external free-field hemispherical radiation correction (dB) -14	-14	-14	-14	-14	-14	-14	-14
Screening Loss (dB)	-5	-5	-5	-5	-5	-5	-5
External noise level at nearest receptor (dB L _{eq}) <i>SPL_{out}</i>	52	55	56	56	53	49	44
Daytime (07:00 – 23:00)	67	56	52	51	57	50	52
Compliance	✓	✓	✗	✗	✓	✓	✓

The above table demonstrates that the noise breakout with the windows open would be below the day-time criteria at the nearest office premises except for the noise level at 250Hz and 500Hz which could be 4/5 dB above the criteria. However, given that these receptors are offices and have sealed windows, and the noise levels are only example noise levels of a similar scenario, this should not be problematic in practice, and we would expect that sufficient management of the space mitigate the risk. It is advised that the operators of the terrace keep their neighbours in mind and should any complaints be received reduce noise levels accordingly.

7.0 Operational Noise Egress (Voices)

Based on the open nature of the terrace, terrace occupants are likely to directly make noise on the roof terrace. This noise, particularly during peak times, could potentially cause disturbances to the surrounding environment if not appropriately managed.

However, it is important to note that this is unlikely to be a significant issue for small scale office use or corporate events. These types of events typically have fewer attendees and are often held during daytime hours, reducing the potential for noise disturbance.



Implementing a noise management plan should suffice to mitigate any potential noise issues and avoid complaints. This plan could include the following measures:

- Restricting the number of attendees at any one time to approximately 50 attendees would help control noise levels.
- Events are to be scheduled during the agreed operating hours of 08:00 – 23:00 (Mon – Sat) and 09:00 – 19:00 (Sun) as per Condition 16 so as to not disturb others.
- Regular noise level checks can ensure that the noise remains within acceptable limits.
- Staff can be trained to manage noise levels and respond to any potential noise issues promptly.
- Keeping open lines of communication with nearby residents and businesses can help address any concerns proactively.

In conclusion, while occupant noise on the roof terrace is a consideration, it is not anticipated to be a significant issue for small scale office or corporate events. With a noise management plan in place, it is expected that any potential noise disturbances can be effectively managed, and complaints avoided. This approach ensures a balance between the normal use of the roof terrace and maintaining a good relationship with the surrounding receptors.

Yours sincerely

James Hardacre

for HANN TUCKER ASSOCIATES