



The Point 173-175, Cheetam Hill Road, Manchester

Noise impact assessment

11884.1

17th July 2024

Revision A



The Point 173-175, Cheetam Hill Road, Manchester

Noise Impact Assessment

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2 Summary

- 2.1 This report assesses the potential noise impact of a proposed rooftop restaurant and bar at The Point, 173-175 Cheetham Hill, Manchester. The project involves transforming the existing rooftop into a high-end dining establishment with both indoor and outdoor seating for approximately 220 customers.
- 2.2 The assessment adheres to relevant guidelines, including the National Planning Policy Framework (NPPF), Noise Policy Statement for England (NPSE), and the Manchester City Council Planning & Noise Technical Guidance.
- 2.3 A digital geometric acoustics model was developed using OTL Suite by PEMARD to predict operational noise levels, considering noise from patrons and one proposed Mitsubishi PQRQ-P(YLM) (550/63kW) climate control unit. Background music levels of 65 dB(A) throughout the restaurant area have also been considered.
- 2.4 The highest calculated noise level at 2 meters from the rooftop due to patrons is 80 dB(A), while at 2 meters from the building's most exposed facade, it is 56 dB(A). Noise levels from the Mitsubishi unit are significantly lower than patron noise.
- 2.5 The noise break-in analysis shows that the expected maximum noise level within the most exposed office space (Treatment Room M) is 29 dB(A), which is significantly below the BS 8233:2014 recommendation of 35-45 dB LAeq for a staff/work area.
- 2.6 Analysis suggests that music sound levels can be as high as 70 dB(A) without increasing the predicted internal ambient noise levels in the 2nd Floor Office spaces. However, to allow for intelligible conversation, levels between 60-65 dB(A) are recommended during normal operation.
- 2.7 The following approach for managing music levels is also recommended:
 - During office hours, music noise levels should be kept below 70 dB(A).
 - Music levels can be increased in the evening when offices are not in use.
 - Management should adjust music levels based on occupancy.
 - Maintain open communication with second-floor office occupants to address any concerns.
- 2.8 Based on these findings, the proposed rooftop restaurant and bar is not expected to cause noise disturbance to the office spaces below, and no further mitigation measures are deemed necessary given the current design and operational plans.
- 2.9 It's important to note that this assessment represents a conservative estimate, and actual noise levels are likely to be lower in real-world conditions due to varying occupancy, speech patterns, and additional sound attenuation factors not accounted for in the model. In conclusion, this

assessment indicates that the proposed development can proceed without causing unacceptable noise impacts on existing office tenants, provided it operates as described.

3 Introduction

3.1 Purpose and Scope

3.2 This report assesses the potential noise impact of the proposed rooftop restaurant and bar at The Point, 173-175 Cheetham Hill Road, Manchester. Intended to accompany a planning application, it identifies potential noise sources and recommends mitigation strategies, where required, to ensure a comfortable environment for both restaurant patrons and existing building tenants on the 2nd Floor. It is understood that the sensitive spaces on the 2nd Floor consist of office spaces and treatment rooms (non-surgical). The assessment adheres to relevant guidelines, national and local planning policies, and industry best practices.

3.3 Proposal Overview

3.4 The proposal involves transforming the existing rooftop space into a high-end dining establishment featuring various seating areas. The design aims to create an attractive venue with background music while minimising potential disturbances to the surrounding area.

3.5 The proposed restaurant and bar layout accommodates approximately 220 customers. The design incorporates a single Mitsubishi PQRY-P(YLM) (550/63kW) unit for climate control and other operational needs. Figure 1 provides a site location map and Figure 2 the proposed rooftop restaurant layout for reference.

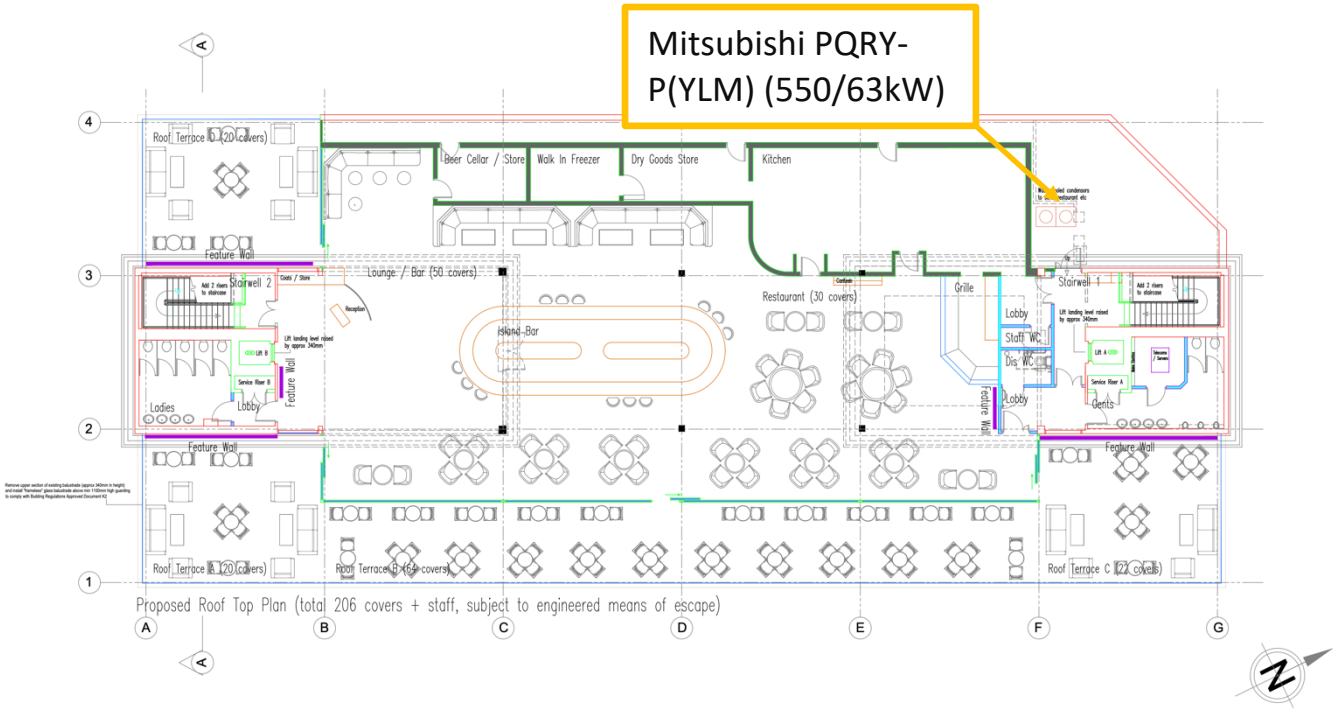


Figure 2: Proposed rooftop restaurant layout



Figure 1: Proposed rooftop restaurant location (red)

4 Planning policy and relevant criteria

4.1 National Planning Policy Framework (NPPF)

4.2 The National Planning Policy Framework (NPPF) Reference³, sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced. In respect of noise, Paragraph 180, 191 and 193 of the NPPF states the following:

4.3 Paragraph 180:

4.4 "e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability..."

4.5 Paragraph 191:

4.6 "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

4.7 a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life⁶⁵ [See Explanatory Note to the Noise Policy Statement for England],

4.8 b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;

4.9 Paragraph 193:

4.10 "Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed. "

4.11 Noise Policy Statement for England (NPSE)

4.12 The Noise Policy Statement for England (Reference 4) states three policy aims as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life."

4.13 The NPSE defines adverse noise impact as follows:

- No Observed Effect Level (NOEL)
This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- Lowest Observed Adverse Effect Level (LOAEL)
This is the level above which adverse effects on health and quality of life can be detected.
- Significant Observed Adverse Effect Level (SOAEL)
This is the level above which significant adverse effects on health and quality of life occur

4.14 The first two aims of the NPSE require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"... all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

4.15 Manchester City Council Planning & Noise Technical Guidance

4.16 The MCC Planning & Noise Technical Guidance document (Reference 2) sets out criteria and guidelines for noise management concerning new development.

4.17 The document provides noise level limits which are understood to be between the No Observed Effect Level (NOEL) (this is the level of noise exposure below which no effect at all on health or quality of life can be detected) and the LOAEL (this is the level of noise exposure above which adverse effects on health and quality of life can be detected) and is therefore in line with the principles of the NPPF and NPSE.

4.18 The Sections and criteria included in the Planning & Noise Technical Guidance document, which are understood to be relevant to the proposed development, are presented below.

4.19 Section 3.7.1.3 Mixed Use Developments:

"Where a planning application includes a proposal to contain a potentially noisy development within the same building as a noise sensitive use or vice versa the noise survey should consider the transfer of noise between the noisy and noise sensitive uses. An example of where this should be considered would be a proposal for a bar or club within the same building as residential properties (see section 3.6.1.2).

Consultants should demonstrate that the structure of the development will be sufficient to adequately contain the noise generated within the development. In doing so consultants should consider:

- *flanking noise;*
- *structure borne noise;*
- *the overall level of noise (L_{Aeq}) generated by the use in question and any tonal or impulsive characteristics that the noise may contain; and*
- *the acoustic properties of the development (including the construction of party floors and/or walls, windows and doors, ventilation systems, and structural columns.)"*

4.20 According to the information provided by the client's Planning Consultant, it is understood that the MCC expressed concerns regarding the potential impact of noise on other tenants within the building. They emphasized that the proposed rooftop restaurant and bar, although designed as a high-end dining experience with background music, must ensure that noise levels, in the offices below remain within acceptable limits to prevent disturbances to the office tenants below. These requirements align with the above Section.

4.21 **Draft IOA Good Practice Guide on the Control of Noise from Places of Entertainment (IOA GPG)**

4.22 Paragraph 1.3 of BS 4142 (Reference 1) states it is not intended to be applied to the rating and assessment of sound from:

- Recreational activities;
- Music and other entertainment;
- People.

4.23 BS 4142 is therefore considered inappropriate for assessing noise from patrons in the proposed external seating area.

4.24 The IOA GPG (Reference 5) provides good practice guidance for the assessment and control of noise from venues and premises which provide regulated entertainment, including noise generated by patrons.

4.25 With regards to patron noise, it states:

"The working group drafting this good practice guide did not feel that, there is currently sufficient consensus or a robust enough evidence base upon which to make noise level based recommendations for the assessment and control of patron noise. Instead the working group recommend that a qualitative but objective, case-by-case approach to patron noise should be undertaken and supported by appropriate acoustic information, where relevant."

4.26 It is therefore considered appropriate to undertake a qualitative assessment of the potential for an adverse impact from the proposed external seating area.

4.27 **Proposed criteria**

4.28 Since the spaces below the proposed rooftop restaurant consist mainly of offices, to safeguard impacts, it is proposed that the noise levels within the office spaces, due to the operational noise of the proposed rooftop restaurant and bar, are lower than the internal ambient noise levels prescribed by BS 8233:2014 (Reference 6) for such spaces.

4.29 For reference, for office spaces, BS 8233:2014 recommends the following design ranges for indoor ambient noise levels:

- Executive Offices: 35-40 dB $L_{Aeq,T}$
- Open Plan Offices: 45-50 dB $L_{Aeq,T}$
- Meeting Rooms: 35-45 dB $L_{Aeq,T}$
- Staff/Work Areas: 35-40 dB $L_{Aeq,T}$

5 Restaurant Operational Noise

5.1 Methodology

- 5.2 The primary noise transmission paths to the office spaces on the 2nd Floor are through the roof slab and façade glazing. To conduct noise break-in calculations, it is first necessary to determine the expected overall noise levels at each element. For this purpose, a digital geometric acoustics model was developed using OTL Suite by PEMARD to predict operational noise levels. This advanced software employs geometric acoustics principles and wave-based ray tracing to simulate sound propagation, accounting for reflection, diffraction, and absorption.
- 5.3 Each of the seating positions was modelled as an individual point source at a height of 1.5 meters, simulating typical seated head positions. Sound power levels (SWL) for each source were based on the raised speech spectrum of a male speaker at 1 meter, as specified in BS EN ISO 9921 (Table 1 provides detailed spectrum data). The proposed Mitsubishi PQRQ-P(YLM) (550/63kW) unit was also modelled as a point source, with its SWL defined based on manufacturer's data (see Table 2).
- 5.4 Music levels in restaurants can vary significantly based on management decisions, time of day, and clientele expectations. This variability makes accurate prediction challenging without specific operational details. It is understood that the intent is to play background noise music only to provide a suitable dining atmosphere and to allow for intelligible conversations. As such, speech noise is considered to be dominant and music noise is not accounted for.
- 5.5 Two receiver grids were established in the model. The first grid was set at 2 meters height across the rooftop, while the second was positioned 2 meters from the most exposed façade. Cumulative noise levels were calculated by summing contributions from all relevant point sources. Figure 3 illustrates the developed acoustic model. The calculations of noise break-in assume full occupancy as a worst-case scenario.

Parameter	Octave band (Hz) L _{eq} (dB)							Global dB(A)
	125	250	500	1k	2k	4k	8k	
SPL at 1 m (dB)	69	69	65	59	53	47	41	66

Table 1: Raised speech spectrum at 1 meter in front of the mouth of a male speaker (source: BS EN ISO 9921)

Parameter	Octave band (Hz) L _{eq} (dB)								Global dB(A)
	63	125	250	500	1k	2k	4k	8k	
SPL at 1 m (dB)	46	68	51	53	49	42	46	40	56

Table 2: Mitsubishi PQRQ-P(YLM) (550/63kW) sound pressure level at 1 meter distance (source: Mitsubishi)

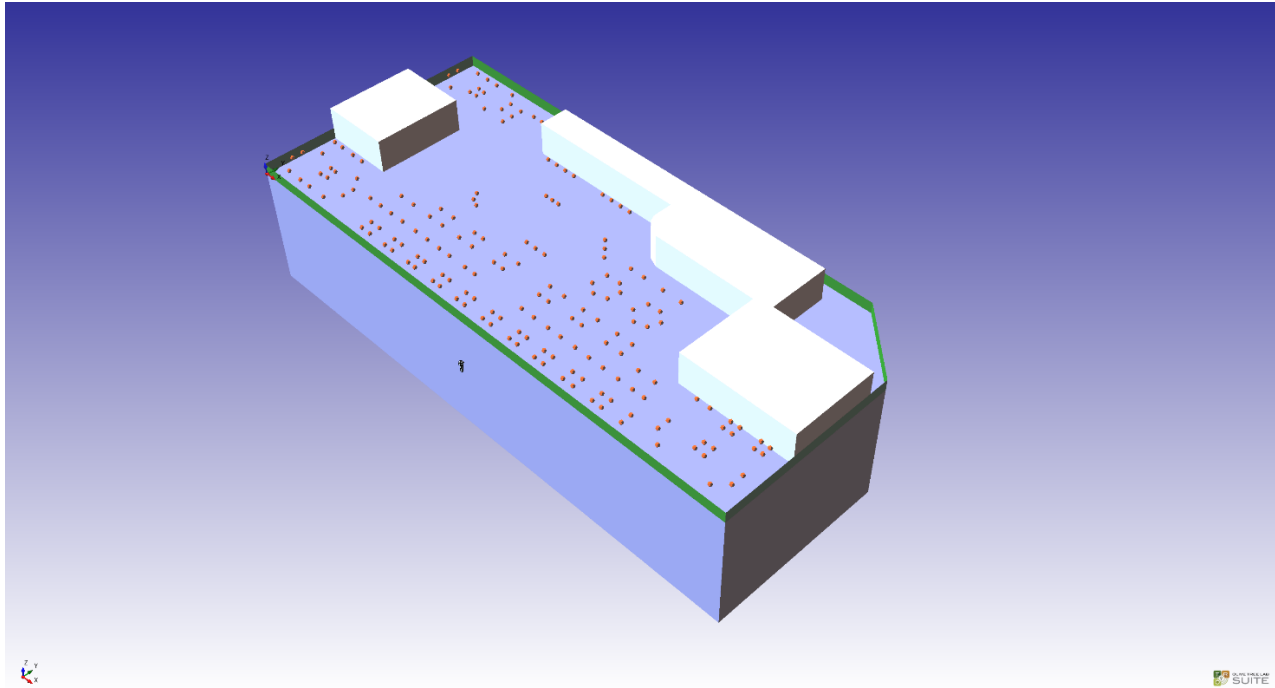


Figure 3: Developed digital geometric acoustics model

5.6 Results and Analysis

5.7 Rooftop and Façade Noise Levels due to Patrons

- 5.8 Based on the detailed methodology described in Section 5.1, Figure 4 and Figure 5 illustrate the calculated cumulative noise levels resulting from patron activity. These levels are represented using contour lines for the rooftop and the most exposed façade, respectively. The visualizations offer a clear spatial understanding of noise distribution across the areas of interest.
- 5.9 Table 3 presents the highest noise levels observed at both the rooftop (2 meters above the surface) and the most exposed façade (2 meters from the building surface). For context, it's important to note that the geometric acoustics model used represents a conservative estimate. In reality, not all patrons will speak simultaneously or at raised levels. The dynamic nature of conversation in social settings typically results in lower overall noise levels than modelled.

Position	Parameter	Octave band (Hz) L _{eq} (dB)								Global dB(A)
		63	125	250	500	1k	2k	4k	8k	
2 m from the rooftop	Highest calculated SPL (dB)	-	69	74	79	77	71	65	57	80
2 m from the building most exposed facade		-	48	52	55	51	43	34	22	56

Table 3: Highest calculated sound pressure levels at 2 meters from the rooftop and building façade - Patron

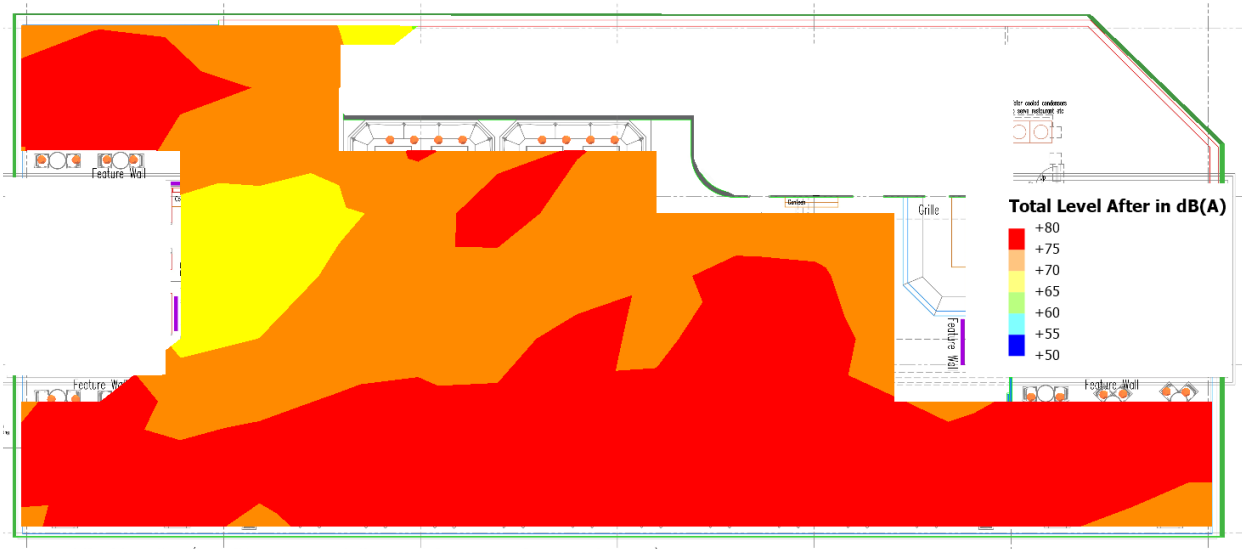


Figure 4: Calculated noise levels at 2 metres from the rooftop (Patrons Noise)

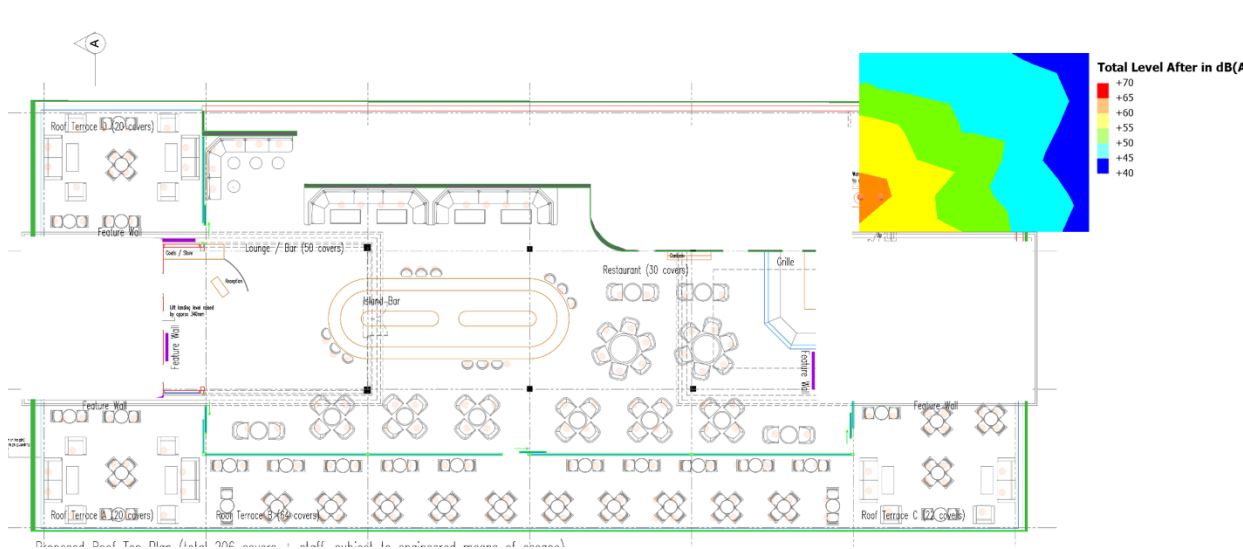


Figure 6: Calculated noise levels at 2 meters from the rooftop - condenser

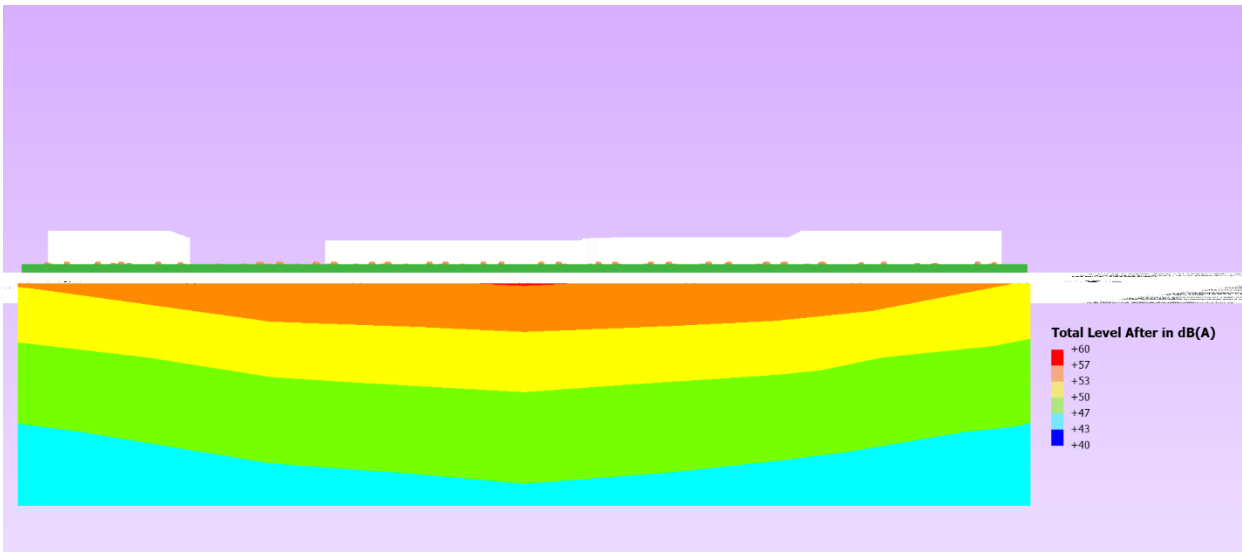


Figure 5: Calculated noise levels at 2 metres from the building most exposed façade (Patrons Noise)

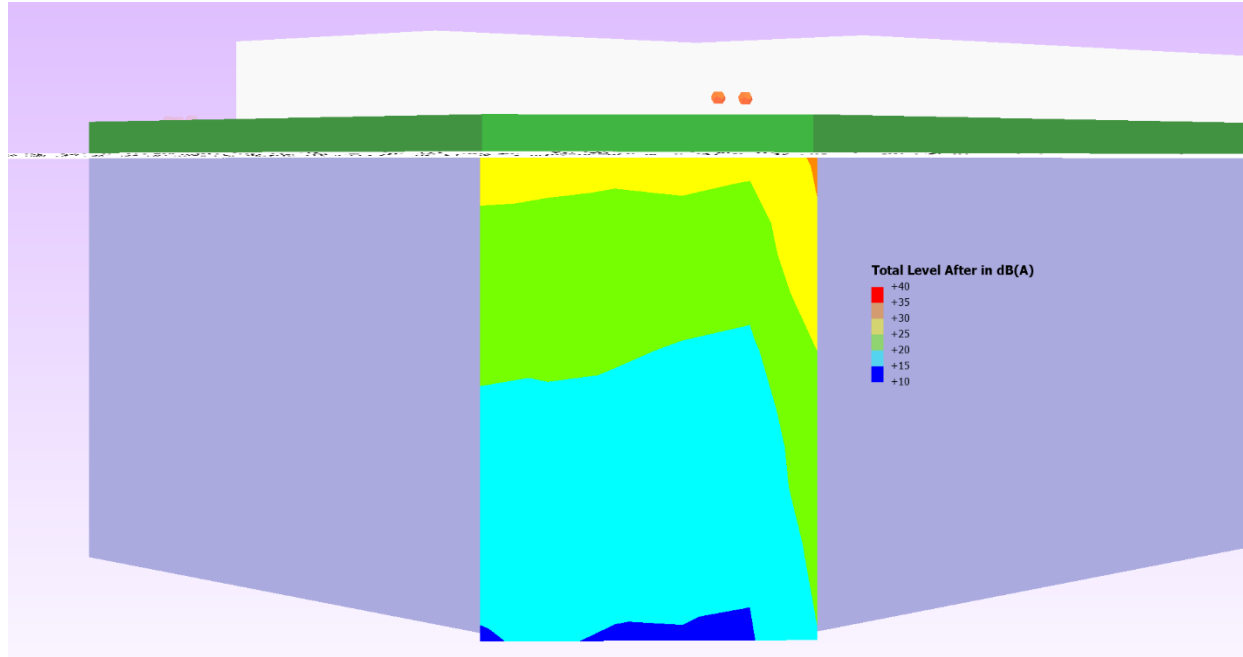


Figure 7: Calculated noise levels at 2 metres from the building most exposed façade - condenser

5.10 Rooftop and Façade Noise Levels due to the Proposed Mitsubishi Units

5.11 Figure 6 and Figure 7 illustrate the calculated noise levels using contour lines for the rooftop immediately adjacent to the units and the most affected façade, respectively. Table 4 details the highest noise levels observed at both the rooftop and façade.

Position	Parameter	Octave band (Hz) L _{eq} (dB)								Global dB(A)
		63	125	250	500	1k	2k	4k	8k	
2 m from the rooftop	Highest calculated SPL (dB)	49	72	51	56	51	45	48	42	60
2 m from the building most exposed facade		23	42	22	21	14	4	4	-	27

Table 4: Highest calculated sound pressure levels at 2 meters from the rooftop and building façade - Condenser

6 Noise Break-in to the Office Spaces

6.1 Methodology

6.2 To determine the levels of noise break-in into the office spaces below the rooftop, the noise levels generated by patrons were considered, as these are more than 10 dB higher than those generated by the proposed Mitsubishi Unit?.

6.3 Noise break-in calculations followed BS 8233 and ISO 12354-1 guidelines, considering a 1-second reverberation time for 2nd Floor spaces.

6.4 The client provided information on the building's construction. The roof consists of 150 mm hollow core planks with a minimum 100mm lightweight insulating screed? above, laid to falls, covered by a waterproof membrane and 50mm PCC pavers. On the building's top floor, the floor to suspended ceiling height is 2460mm, with a 750mm deep void between that and the underside of the 150mm hollow core concrete planks forming the roof deck. The suspended ceiling is installed on a metal frame and it is understood to consist of a standard 12.5 mm layer of plasterboard.

6.5 The glazing comprises double glazing in curtain wall units. The glazing specification is approximately 20mm width overall, consisting of a 6.4mm laminated inner leaf, 8mm spacer, and 6mm toughened outer leaf.

6.6 The acoustic insulation of the rooftop slab and façade was determined using INSUL v9.0 software by Marshall Day Acoustics. Since details of the roof pavers are not known, the calculations of sound insulation for the roof only accounts for the hollow core planks and the 12.5 mm dropped ceiling. This is a conservative approach.

6.7 A plan of the 2nd floor office was provided by the client and is shown in Appendix A. The most exposed rooms are those with the largest window to room floor area ratio and therefore the calculations were carried out for Treatment Room M, which according to the client is used for low-level cosmetic procedures (i.e. non-surgical). This room may be classified as a staff/work area and as such the indoor ambient noise criteria range set out by BS 8233:2014 is 35-45 dB $L_{Aeq,T}$.

6.8 Results

6.9 Table 5 indicates the predicted sound reduction values for the roof and glazing constructions. Based on these performance values and the noise levels stated in Table 3, calculations of noise break-in were carried out and its results are presented in Table 6.

6.10 The calculations indicate that the expected maximum noise levels within Treatment Room M, due to the operation of the proposed rooftop restaurant, is 29 dB(A). These noise levels are significantly below the criteria range set out by BS 8233:2014 and therefore no further mitigation measures are deemed required. The noise break-in for all other rooms part of the 2nd Floor office spaces will be lower than 29 dB L_{Aeq} .

6.11 In practice these noise levels are expected to be lower than predicted for the following reasons:

- The restaurant is unlikely to operate at full capacity at all times and is likely to be busier later in the evening when the office spaces are not being used.
- Not all patrons will speak simultaneously or at raised levels;
- The calculations don't account for potential additional sound attenuation from the roof pavers.

Element	Octave band (Hz) R (dB)							Rw (C;C _{tr})
	63	125	250	500	1k	2k	4k	
Roof	34	41	50	61	75	78	85	62 (-2;-8)
Façade (glazing)	28	27	23	33	42	40	48	36 (-1;-4)

Table 5: Predicted roof and façade sound reduction performance

Element	Octave band (Hz) L_{Aeq} (dB)					Global
	125	250	500	1k	2k	
Roof	16	19	19	6	-2	23
Façade (glazing)	9	24	23	13	8	27
Roof + Fcd (glazing)	17	26	25	14	9	29

Table 6: Predicted internal ambient noise levels within the most exposed room

6.12 Music Sound Level

6.13 Based on the predicted noise levels stated in Table 3, our analysis suggests that music sound levels can be as high as 70 dB(A) without increasing the predicted internal ambient noise levels in the 2nd Floor Office spaces. However, in practice, to allow patrons to have intelligible conversations music noise levels will likely have to remain in the range of 60-65 dB(A).

6.14 We recommend the following approach for managing music levels:

- During Office Hours: When the 2nd Floor office spaces are in use, music noise levels should be kept below 70 dB(A). This ensures that the combined noise from patrons and music doesn't exceed suitable internal noise levels in the offices.
- Evening Operations: Later in the evening, when the offices are not in use, music noise levels can be increased if desired, as there are no relevant noise-sensitive receivers nearby during these hours.
- Occupancy-Based Adjustments: The restaurant management should be prepared to adjust music levels based on occupancy. During periods of low occupancy, music levels may need to be reduced to maintain the balance between ambiance and noise impact.
- Establish and maintain communication with the occupants of the second-floor offices to safeguard their comfort and determine any potential operation limitations.

7 Conclusion

- 7.1 Based on the comprehensive noise impact assessment conducted for the proposed rooftop restaurant and bar at The Point, 173-175 Cheetham Hill, Manchester, it is concluded that the development can proceed without causing unacceptable noise impacts on existing office tenants.
- 7.2 The predicted noise levels in the most exposed office space are significantly below the BS 8233:2014 recommendations for indoor ambient noise levels and therefore no additional noise mitigation measures are deemed necessary.
- 7.3 The conservative nature of the assessment suggests that real-world noise levels may be lower than predicted.
- 7.4 Considering the context of the existing acoustic environment, the assessment result indicates the likelihood of low noise impacts. This impact is considered to be a NOEL in alignment with the NPPF and NPSE aims.

8 References

- 1 BS 4142 2014: A1+2019: Method for rating and assessing industrial and commercial sound.
- 2 Planning and Noise Technical Guidance. Technical document, Manchester City Council, 2022.
- 3 National Planning Policy Framework, Ministry of Housing, Communities & Local Government, July 2021.
- 4 Noise Policy Statement for England, Department for Environment, Food and Rural Affairs, March 2010.
- 5 Institute of Acoustics, Good Practice Guide on the Control of Noise from Places of Entertainment, December 2016 Draft for Consultation.
- 6 BS 8233:2014: Guidance on sound insulation and noise reduction for buildings.
- 7 BS EN ISO 12354-4:2017 Building acoustics - Estimation of acoustic performance of buildings from the performance of elements. Part 4: Transmission of indoor sound to the outside.
- 8 R. Watson & Owen Downey. The Little Red Book of Acoustics. Blue Tree Acoustics, 2012.
- 9 Architectural drawings: The Point Existing Second Floor Plan Rev A 4 July 24.
- 10 ISO 9613: Acoustics - Attenuation of sound during propagation outdoors.
- 11 BS EN ISO 9921:2003 Ergonomics - Assessment of speech communication.

Appendix A 2nd Floor Office Plan

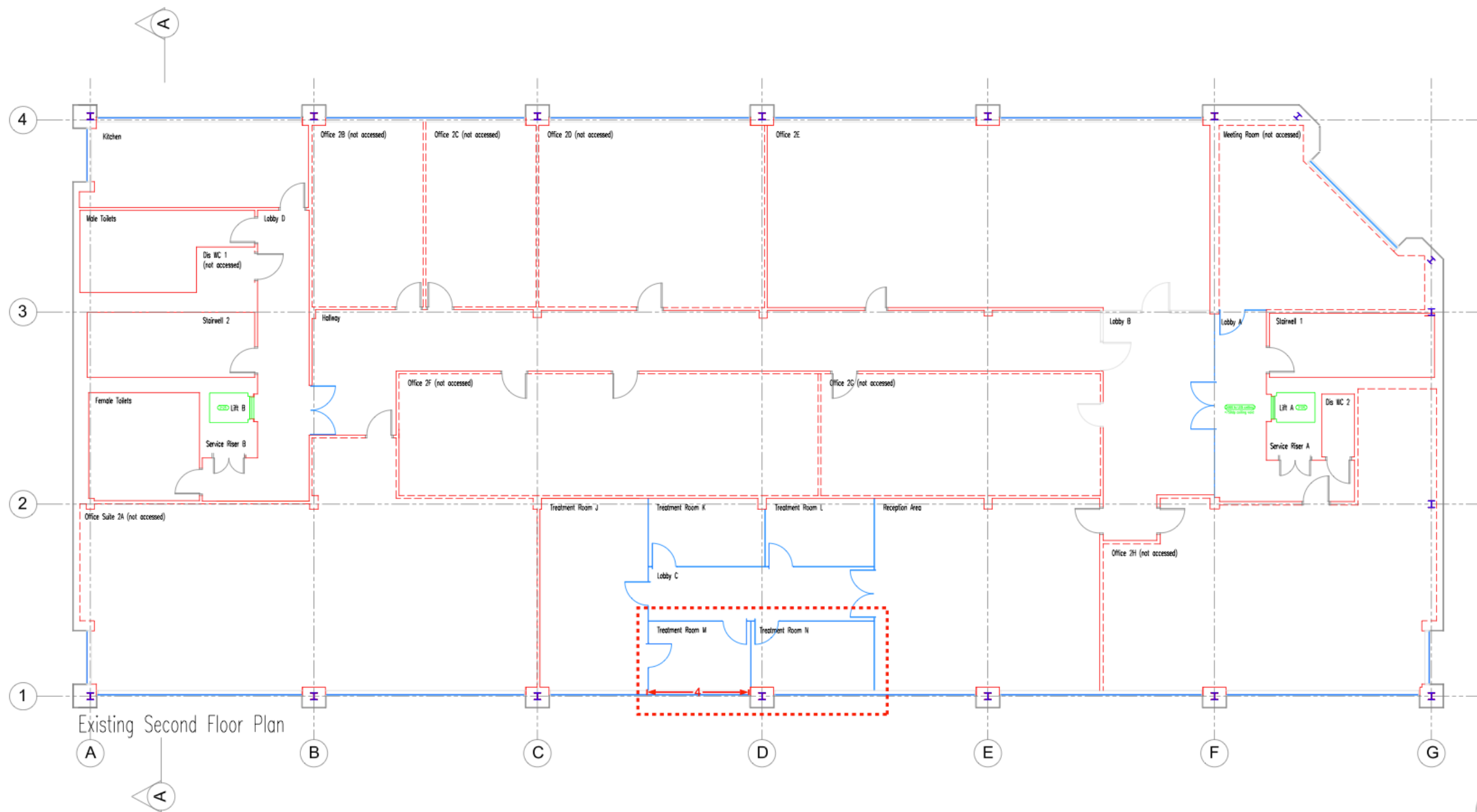


Figure 8: 2nd Floor office plan (most exposed rooms highlighted in red)

Appendix B Calculation details (noise break-in)

ROOM DETAILS	
ID	2nd Floor Office Space
Type	Treatment Room M
Volume (m3)	23.4
Wall (m2)	0.0
Window 1 (m2)	0.0
Window 2 (m2)	0.0
Roof (m2)	10.0
Wall vent (m2)	0.0
No. of passive vents	0.0
Element total area (m2)	10.0

TERM	DESCRIPTION	Rw (C;Ctr)						GLOBAL dB(A)
			125	250	500	1000	2000	
LAeq	External ff noise	-	50	62	73	74	69	77
RT (s)	RT (s)	-	1.0	1.0	1.0	1.0	1.0	-
Abs. Area (m2)	Abs. Area (m2)	-	4	4	4	4	4	-
10log A	10log A	-	6	6	6	6	6	-

R (Wall)	n/a	-	100	100	100	100	100	-
R (Window 1)	n/a	-	100	100	100	100	100	-
R (Window 2)	n/a	-	100	100	100	100	100	-
R (Roof)	Existing Roof	62 (-2; -8)	41	50	61	75	78	-
Dne (Ventilator 1)	n/a	-	100	100	100	100	100	-
Dne (Ventilator 2)	n/a	-	100	100	100	100	100	-
R (Vent)	n/a	-	100	100	100	100	100	-

R (Facade)	All façade elements	-	41	50	61	75	78	-
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LAeq	IANLs	-	16	19	19	6	-2	23
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ROOM DETAILS	
ID	2nd Floor Office Space
Type	Treatment Room M
Volume (m3)	23.4
Wall (m2)	0.0
Window 1 (m2)	10.4
Window 2 (m2)	0.0
Roof (m2)	10.0
Wall vent (m2)	0.0
No. of passive vents	0.0
Element total area (m2)	20.4

TERM	DESCRIPTION	Rw (C;Ctr)						GLOBAL dB(A)
			125	250	500	1000	2000	
LAeq	External ff noise	-	29	40	49	48	41	52
RT (s)	RT (s)	-	1.0	1.0	1.0	1.0	1.0	-
Abs. Area (m2)	Abs. Area (m2)	-	4	4	4	4	4	-
10log A	10log A	-	6	6	6	6	6	-

R (Wall)	n/a	-	100	100	100	100	100	-
R (Window 1)	Existing Fcd Glz	36 (-1;-4)	27	23	33	42	40	-
R (Window 2)	n/a	-	100	100	100	100	100	-
R (Roof)	n/a	-	100	100	100	100	100	-
Dne (Ventilator 1)	n/a	-	100	100	100	100	100	-
Dne (Ventilator 2)	n/a	-	100	100	100	100	100	-
R (Vent)	n/a	-	100	100	100	100	100	-

R (Facade)	All façade elements	-	30	26	36	45	43	-
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LAeq	IANLs	-	9	24	23	13	8	27
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Appendix C Professional qualifications and competence

- C.1 All Apex Acoustics consultants work under the close supervision of a member who holds a qualification in acoustics and is a member of the IOA.
- C.2 This can be verified by searching the Institute of Acoustics' list of Members, available here, with the surname of the consultant.
<http://www.ioa.org.uk/membership-check>
- C.3 Apex Acoustics is an Association of Noise Consultants (ANC) member. The ANC is a trade organisation which seeks to raise the standards of acoustic consultancy, and as such, there are barriers to entry to ensure members' competency.
- C.4 An appropriately qualified and experienced acoustic consultant has completed and checked this report.