Noise Impact Assessment

Maybrook House

Revision P03, May 2026



atelier ten

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Prepared

Prepared by:	Harry B Rees
Signed:	HBR
Date:	01.05.2026

Checked

Checked by:	Celia Diaz Brito
Signed:	CDB
Date:	04.05.2026

Approved

Approved by:	Ben F Burgess
Signed:	BFB
Date:	05.05.2026

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Atelier Ten
19 Perseverance Works
38 Kingsland Road
London E2 8DD
United Kingdom
T +44 (0) 20 7749 5950
W atelierten.com

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Executive summary

Maybrook House—Acoustic design

The following report assesses the possible noise impact the proposed development may have on existing nearby noise sensitive receptors as well as how noise can be controlled so that the impact on proposed residential dwellings is within guidelines.

The key takeaways are summarised below.

Noise break-in (residential dwellings)

The site is generally considered to be exposed to moderately high noise levels from road traffic—with significant presence of existing noise from plant items.

Façade break-in calculations have been performed to determine the minimum sound insulation requirements for the different elements of the façade. Owing to the inclusion of mechanical ventilation (and cooling), sound ingress though ventilation openings is not a material concern.

It is estimated that moderate—high performing acoustic glazing will be required for elevations facing the roads.

The glazing build-up given to the Level 01 bar space has also been considered in the context of noise break-out to NSRs.

Noise break-out

It is also important that the operation of the development from noise associated with newly installed fixed mechanical plant is not unduly disturbing to nearby noise-sensitive receivers, as well as the development's own elevations.

Plant noise emission limits have been set in accordance with Local Planning Authority requirements.

Conclusions

Based on the above, noise is not considered to form a barrier to development.

1 Introduction

Located in a prominent position on the corner of Deansgate and Blackfriars Street, Maybrook House is the retrofit and extension of the existing Maybrook House building into a new 8 storey hotel.

1.1 Proposals

The proposed Maybrook House scheme includes:

- a two-storey extension at the top of the building, increasing its overall height from the existing six/seven storeys to eight
- six floors of hotel rooms (Level 02—07), with a small allowance of hotel rooms also provided on Level 01
- a large open plan bar and lobby space at Level 01
- the existing retail units at Ground Floor are being retained.

1.2 Scope

Working alongside Jon Matthews Architects (JMA), Atelier Ten's acoustic scope for this report is to conduct an early-stage noise impact assessment at RIBA Stage 2, in support of a planning application for the site.

The intention of this report is to provide information to the Local Planning Authority concerning the acoustic design of the scheme, namely the control of noise emissions associated with the operation of the development and the suitability of the hotel in terms of internal ambient noise levels for resting and sleeping.

The report focuses on the following key acoustic topics with regard to the development of the proposed scheme:

- Relevant nationwide and local standards and guidelines
- Details of the comprehensive long-term noise survey undertaken at the site
- 3D acoustic modelling calibrated to the on-site measured noise environment
- Façade glazing and ventilation performance requirements to achieve target internal ambient noise levels during typical operation and overheating conditions
- Plant noise limits and guideline mitigation measures
- Conclusions of the acoustic assessment and feasibility of the development from an acoustic perspective.

It should be noted that Atelier Ten acoustics are also appointed to provide a Stage 2+ Building Acoustics design report for Maybrook House (ref: 6936-A10-XX-XX-RP-O-00-006—Stage 2 Building Acoustics Report).



Figure 1.1 Maybrook House (source: Google Earth)

2 Design Criteria

2.1 Relevant guidance

This report is informed by the following standards and guidelines:

- The National Planning Policy Framework, 2024 (NPPF)
- The Noise Policy Statement for England, 2010 (NPSE)
- Planning Practice Guidance, 2019 (PPG)
- BS 8233: 2014 - Guidance on sound insulation and noise reduction for buildings
- BS 4142:2014+A1:2019 - Methods for rating and assessing industrial and commercial sound
- Manchester City Council, Planning and Noise Technical Guidance, 2026.

2.2 Planning Policy on Noise Impact (NPFF and NPSE)

The NPPF is the overarching Planning Policy document that applies to all new developments in England. The guidance and assessment criteria given (or referred to) in this document can, therefore, be applied to all other standards in assessing the suitability of granting Planning Permission concerning noise impact.

The NPPF states that planning policies and decisions should aim to:

"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 life; and

identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."

With specific reference to noise impact, the NPPF document refers to the Noise Policy Statement for England (NPSE). The NPSE provides guidance, which enables decisions to be made regarding the acceptable noise burden to place on society, using three key phrases – the No Observed Effect Level (NOEL), the Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL).

To provide a consistent frame of reference (and to allow a view to be taken on the suitability of the application regarding the relevant planning guidance), the levels or criteria given in other relevant documents used in the assessment can be re-framed as shown in Table 2.1, and expanded in more detail in Table 2.2.

Table 2.1 NOAEL, LOAEL and SOAEL

Effect level	Description
NOEL	The NOEL is the level of noise impact below which no effect can be detected, and there would be no discernible negative effect on health or quality of life.
LOAEL	The LOAEL is the lowest level of noise impact above which adverse effects on health or quality of life can be detected. Designing noise impacts to be equal to or less than the LOAEL should see that any adverse effects on health or quality of life are negligible.
SOAEL	The SOAEL is the level above which significant adverse effects on health and quality of life occur. Designs should always seek to avoid a noise impact, which would be categorised as a SOAEL.

2.3 Manchester City Council

Engagement was sought with Manchester City Council (MCC) in advance of this assessment, to clarify the methodology and discuss any specific requirements that MCC may have for the development.

Following discussion with the Environmental Health Officer (EHO) via email in March 2026 (via the planning consultant Asteer Planning), the following is understood to be agreed and relevant to this development:

- Plant items including intake or extract louvres/terminations should be considered alongside rooftop plant
- Specific consideration should be given to Noise Sensitive Receptors (NSRs) which overlook the rooftop and therefore do not benefit from as much screening (from barriers and the building itself) as lower level NSRs
- Emergency plant items (e.g. life safety generator) can be accepted up to a level of +10 dB above the $L_{A90,T}$ background noise level
- Emergency plant items should also have a clear testing schedule and arrangement should be made to communicate this to nearby receptors
- Any entertainment noise use within the building should be captured with an appropriate noise break-out assessment if relevant. At this stage, this is not considered to be required for this scheme, though high-level advice has been provided at this stage regarding music in the bar/restaurant, regarding MCC criteria for 5 dB below the representative $L_{A90,T}$ at the NSR in each octave band
- Best practice plant noise limits for normal operation should be set at least 5 dB below the representative background noise levels measured and aim to achieve a NOAEL or LOAEL level of impact.

Table 2.2 Planning Practice Guidance

Perception	Example outcomes	Increasing effect level	Action
Not Noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not so much that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in the behaviour and/or attitude. E.g. turning up volume of television; speaking more loudly; where there is no alternative means of ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of live.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in the behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in the acoustic character of the area	Significant Observed Adverse Effect	Avoid through the use of appropriate mitigation whilst taking into account the social and economic benefit
Noticeable and very disruptive	Extensive and regular changes in the behaviour and/or inability to mitigate the effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent through use of appropriate mitigation

2.4 Noise break-in

Indoor Ambient Noise Levels (IANLs) are used to describe the cumulative noise level from external noise sources (i.e. road, rail, and air traffic) and internal building services noise.

2.4.1 IANLs during typical conditions

Internal Ambient Noise Level (IANL) requirements during typical operation are shown in Table 2.3. These are established from BS 8233, which sets out criteria in the context of living rooms, dining rooms and bedrooms—during daytime and night-time periods.

For the purposes of a hotel development, each hotel room is defined as a "bedroom" and thus, subject to the bedroom criteria in BS 8233.

Table 2.3 Indoor ambient noise levels for dwellings (BS 8233: 2014)

Location	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Bedroom	$L_{Aeq,16h}$ 35 dB	$L_{Aeq,8h}$ 30 dB $L_{AF,max}$ 45 dB

2.4.2 IANLs during "Overheating" conditions

During overheating conditions, acoustic criteria is derived from Approved Document O. This document is primarily concerned with internal ambient noise levels during "overheating" conditions when windows are opened to provide further ventilation and cooling in the hottest months of the year.

The criteria is presented in Table 2.4; however, it should be noted as covered in Section 5.2, that openable windows are not proposed at Maybrook House and that cooling/ventilation to combat overheating is provided by mechanical means.

Table 2.4 Noise limits in bedrooms during overheating conditions for the use of openable windows to remove excessive heat

Time period	Ambient noise level	Maximum noise level	Source
Daytime (07:00-23:00)	$L_{Aeq,16h}$ 45 dB	-	Atelier Ten best practice
Night-time (23:00-07:00)	$L_{Aeq,8h}$ 40 dB	$L_{AF,max}$ 55 dB	Building Regulations Part O

2.4.3 Non-residential spaces

While not a direct concern in this report, for the purposes of completeness, the noise break-in assessment in Section 5 includes the glazing requirements for the Level 01 bar space.

The criteria and subsequent design of this space is covered in more detail in the Stage 2 Building Acoustics report.

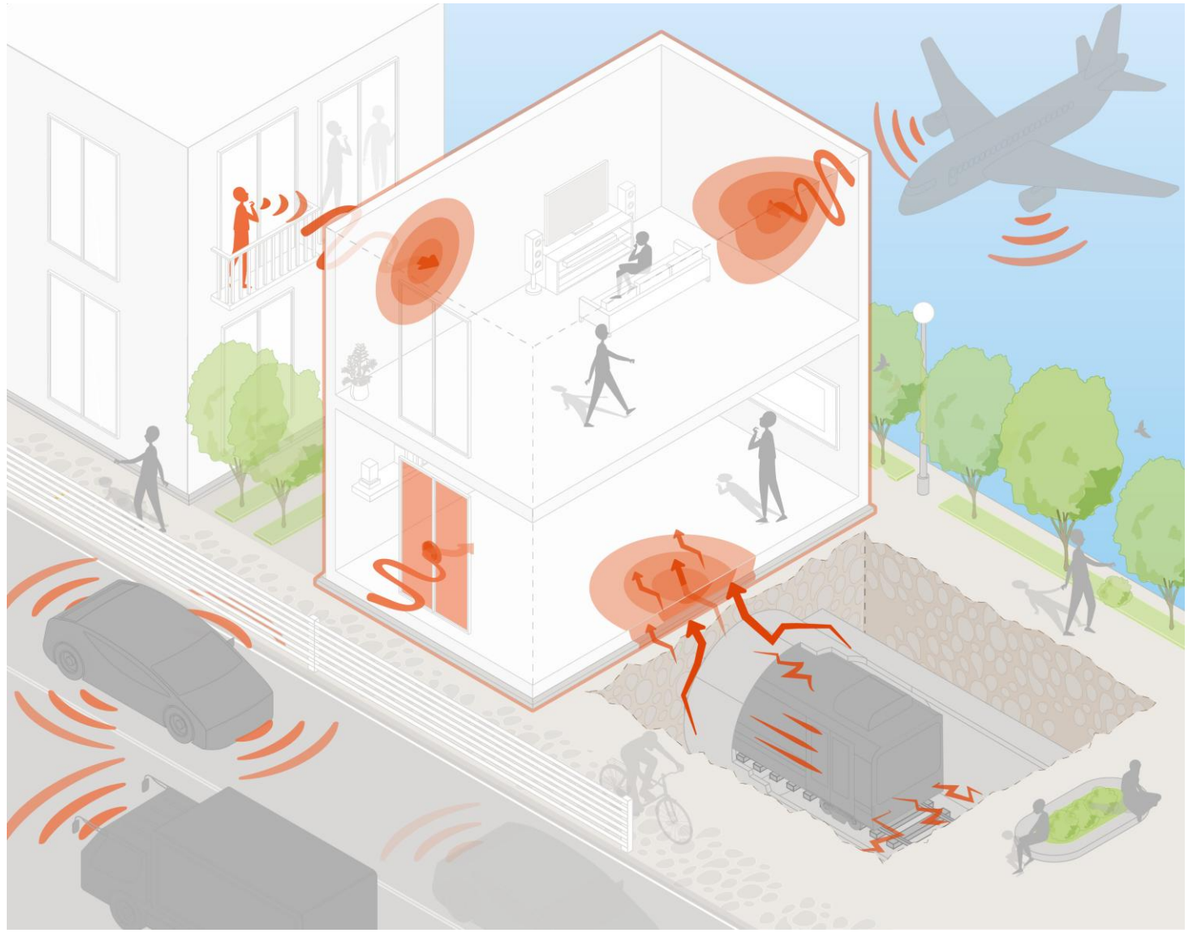


Figure 2.1 Noise break-in graphic

3 Environmental Noise Survey

A noise survey was conducted by Hoare Lea in 2023 to inform a previous office development at the site. The data has been taken in good faith to inform the acoustic design of the Maybrook House.

3.1 Site location

The development site is situated at the intersection of Blackfriars Street and Deansgate at Maybrook House, 50-52 Deansgate, Manchester M3 2FE.

The nearest noise sensitive receptor (NSR) is considered to be the "Treehouse Hotel Manchester", as shown in Figure 3.1, which overlooks the site directly.

3.2 External noise survey details

The Hoare Lea noise survey was conducted between Thursday 28th September and Monday 2nd October 2023, consisting of two long-term unattended logging meters recording at 15-minute intervals.

The raw logged noise survey data provided by Edmund Shipway in February 2026 has been processed to obtain parameters representative for the design of a hotel. The following documents prepared by Hoare Lea for the previous office scheme are referenced in this report:

- REP-1015037-5B-GK-20240610-Noise assessment report-Rev00, dated 10th June 2024
- REP-1015037-05-GK-20240610-Initial acoustic design report-Rev00, dated 10th June 2024.

Noise measurements were undertaken at two locations:

- LT1: Long-term measurement atop the roof to capture local background noise measurements relevant to the noise climate experienced by nearby NSRs
- LT2: A noise measurement along Deansgate capturing façade incident noise levels from road traffic - considered to be the dominant noise source in the vicinity of the site.

The long-term measurement data, by virtue of being captured over 4 full days, is considered a robust and reliable representation of the prevailing noise climate at the site, particularly as noise levels are driven by road traffic noise and the survey took place post-COVID.

A summary of the measured results is presented in Figure 3.2.

3.2.1 Weather conditions

Weather conditions during the survey were reported to be typical::

- Temperatures of 10 - 19°C
- Low wind speeds
- Some periods of non-substantial rain during the survey period.

In summary, weather conditions are considered unlikely to have had a significant effect on the measurement results.

3.2.2 Other factors

It was also noted that MEP plant items were in operation on rooftops of other nearby development, specifically affecting the LT1 rooftop noise measurement location during some periods of the day. These periods have been identified, and statistical analysis of background noise levels has been employed to avoid influence on the results.

This also allows noise from existing plant items to be isolated from the survey results, to better understand their contribution to the existing noise climate at the site.

3.3 External noise survey results

The noise survey locations undertaken by Hoare Lea can be seen summarised in Figure 3.2 - as per the previous Hoare Lea Noise assessment report.

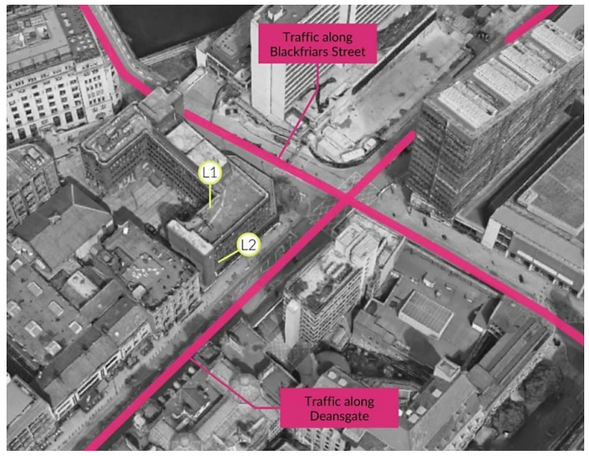


Figure 3.2 Measurement locations L1 and L2 (source: Hoare Lea)

The long-term measurement results taken at LT1 and LT2 over the 96-hour measurement period are shown in and can be summarised as follows:

- $L_{Aeq,T}$: Logarithmic average over reference time periods, daytime (07:00—23:00) and night-time (23:00—07:00); represents typical average noise exposure
- $L_{AF,max}$: 10th highest recorded maximum noise level during night-time (23:00—07:00) measurement periods; represents peak noise levels associated with instantaneous events e.g. motorbike pass-bys, emergency sirens, etc.

Referencing ProPG guidance, the noise climate at the development site could be summarised as medium-high, with a reasonable level of adverse effect possible without appropriate mitigation.

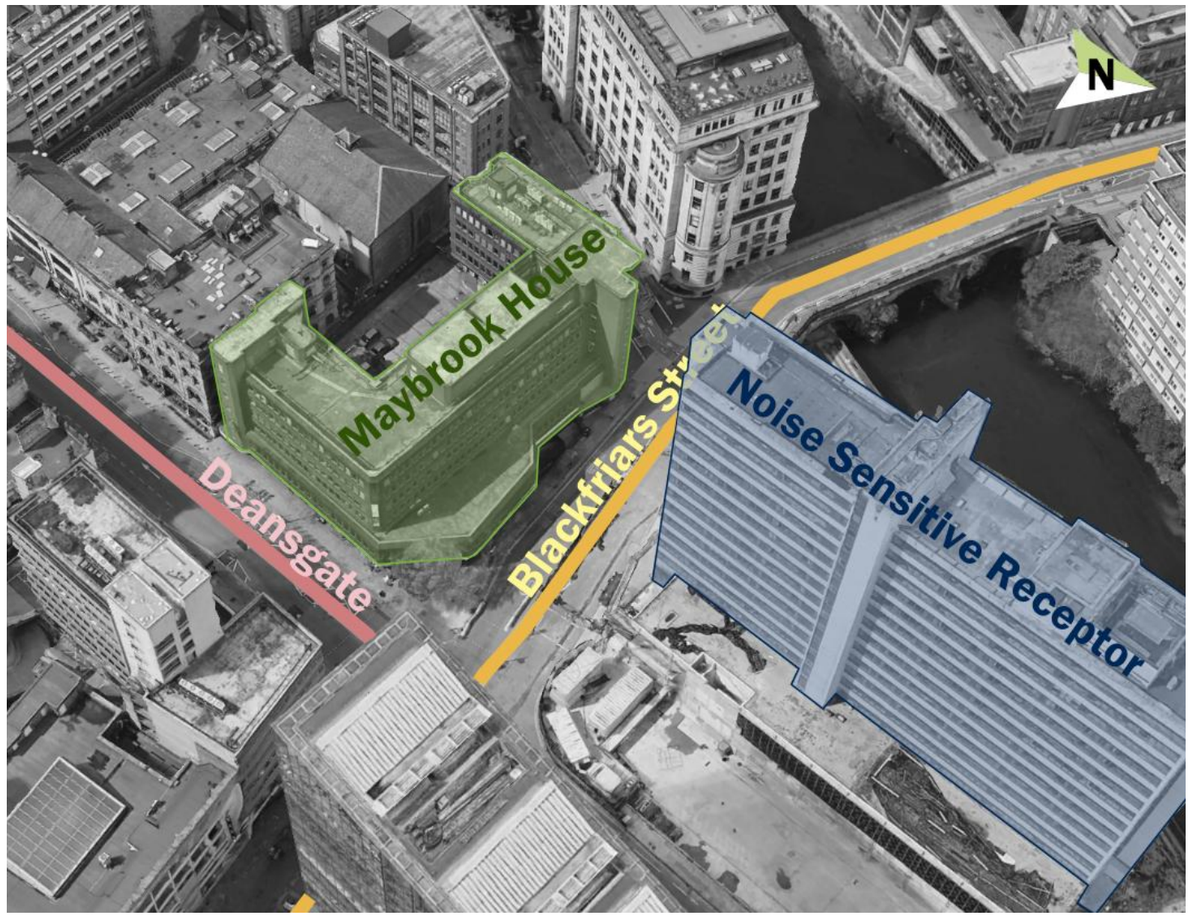


Figure 3.1 Maybrook House - aerial site image, adjacent roads and nearby NSRs.

Table 3.1 L1 - long term measurement results summary

Time Period	Ambient noise level $L_{Aeq,T}$ (dB)	Maximum noise level $L_{AF,max}$ (dB)
Daytime	57	-
Night-time	51	69

Table 3.2 L2 - long term measurement results summary

Time Period	Ambient noise level LAeq,T (dB)	Maximum noise level LAF,max (dB)
Daytime	65	-
Night-time	62	86

3.3.1 Background noise levels

Measurement position L1

At L1, the background noise levels a predominantly low, particularly at night. The large uptick in noise levels observed in the daytime data, understood to be during periods where nearby plant items are in operation, indicates that reasonable levels of plant noise impact is already present at the site.

In terms of the assessment, it is considered that the background noise levels measured at L1 represent a worst-case assessment due to being marginally lower than those observed at L2.

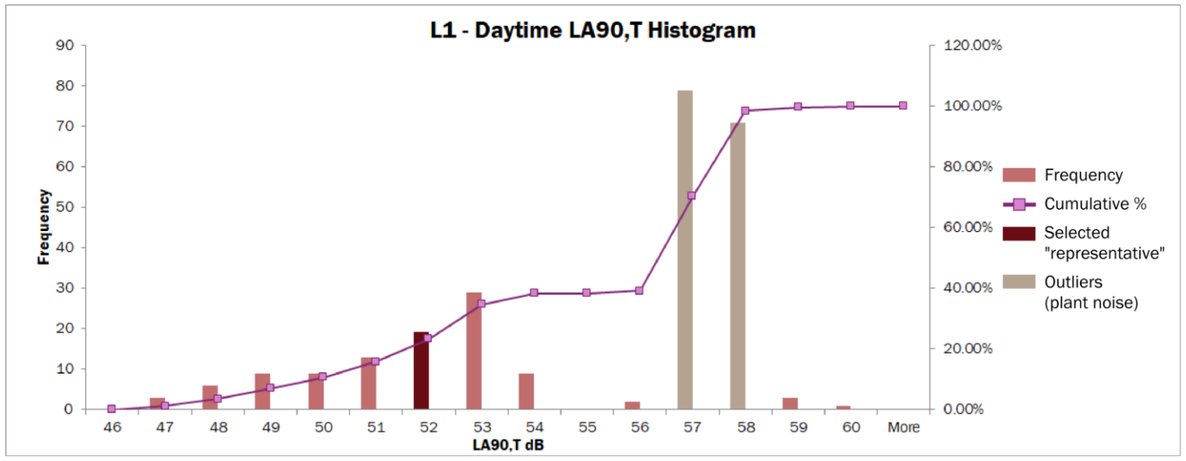


Figure 3.4 L1 Daytime background noise levels - histogram

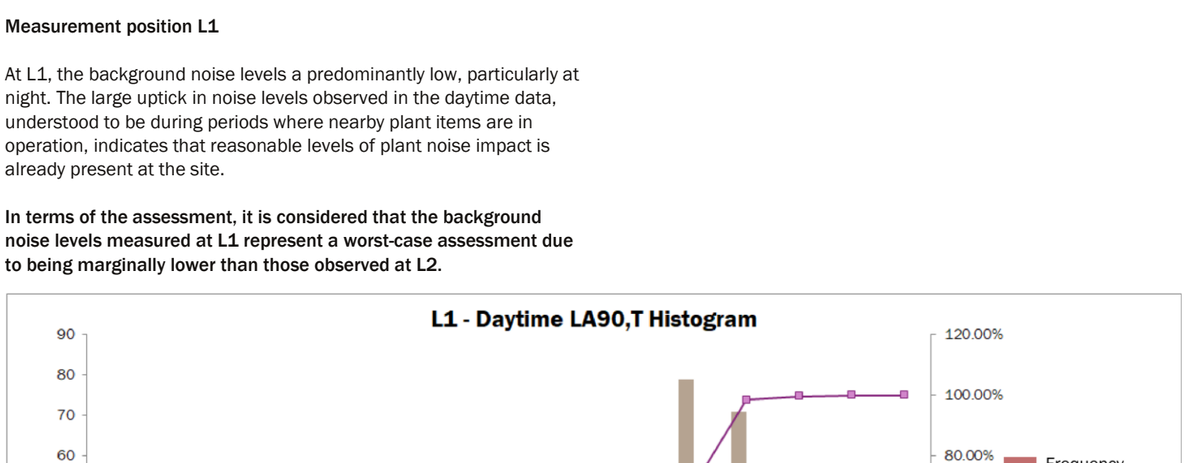


Figure 3.3 L1 Night-time background noise levels - histogram

Measurement position L2

At L2, background noise levels are marginally higher due to the location being less shielded from environmental noise sources.

L2 may be more representative of NSRs exposed to road traffic noise, however, the lower levels measured at L1 are considered worst-case and more representative of shielded locations (or residential rooms at much higher floor levels.

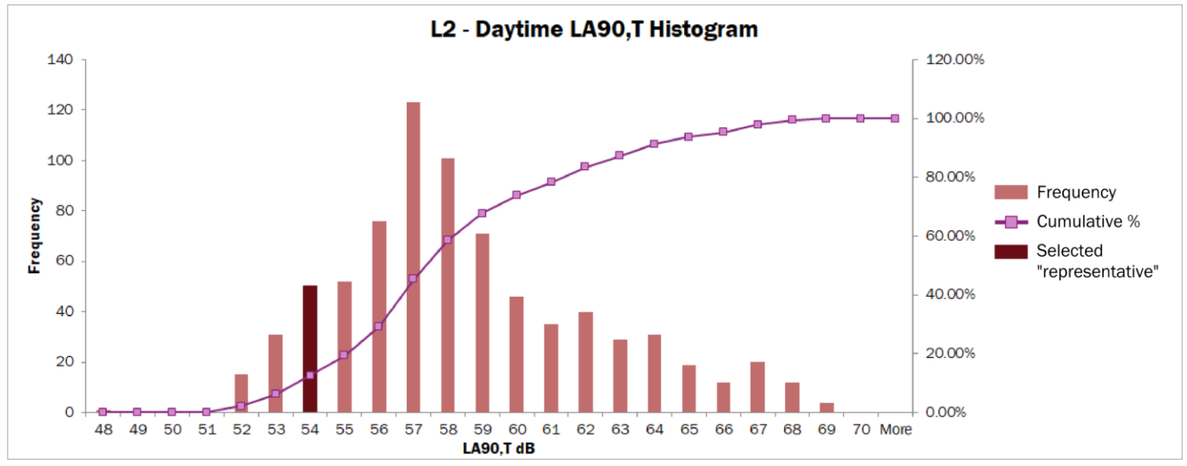


Figure 3.6 L2 Daytime background noise levels - histogram

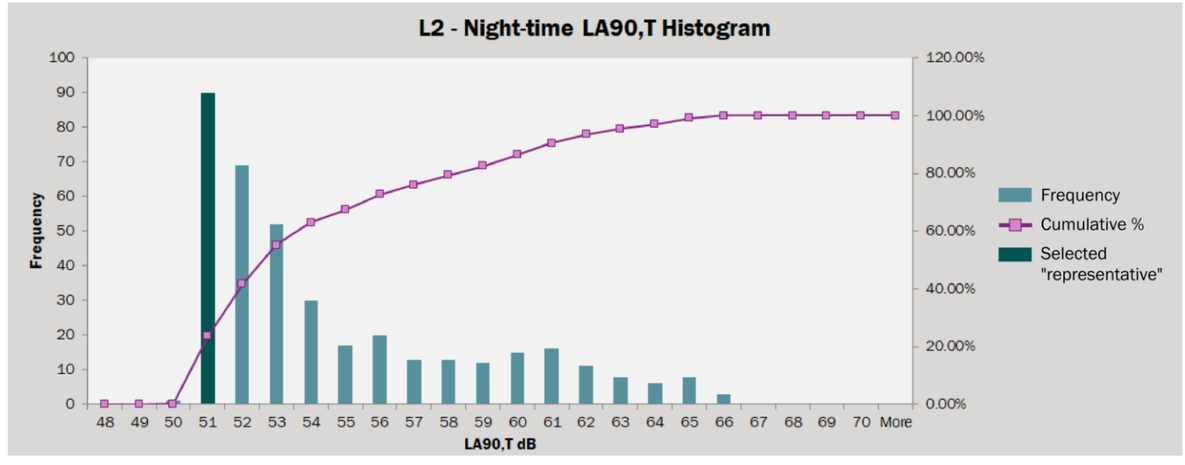


Figure 3.5 L2 Night-time background noise levels - histogram

4 3D Acoustic Model

A 3D acoustic model has been constructed in CadnaA® 2026 acoustic software to analyse the proposed development site in detail.

4.1 Calibration

The existing site has been calibrated using open-source geographical data, noise survey data and the proposed layouts, to input the following into the 3D acoustic model:

- Existing road network
- Existing topography surrounding the site
- Existing massing of Maybrook House and surrounding buildings
- Noise survey measurement positions and results have been calibrated within the 3D model of the existing condition
- The proposed massing (i.e. the Level 6-7 extension) has been input in line with architectural plans frozen as of May 7th 2026
- Existing plant items have been input as a representative area source calibrated to the noise survey results.

4.1.1 Limitations

The assessment has been based on the results produced through a noise modelling exercise, which provides calculations on the likely future noise levels. In order to increase the reliability of the results, the models have been calibrated to the noise levels measured on-site during daytime and night-time periods. However, this does not guarantee full accuracy of the calculated noise levels.

Typically, an uncertainty within a range of approximately ±3 dB could be expected from computer noise modelling software. However, this uncertainty has been controlled as far as practicable by cross-referencing the levels of calculated noise impact against the noise measurements captured on site.

4.2 Results

4.2.1 Daytime noise levels

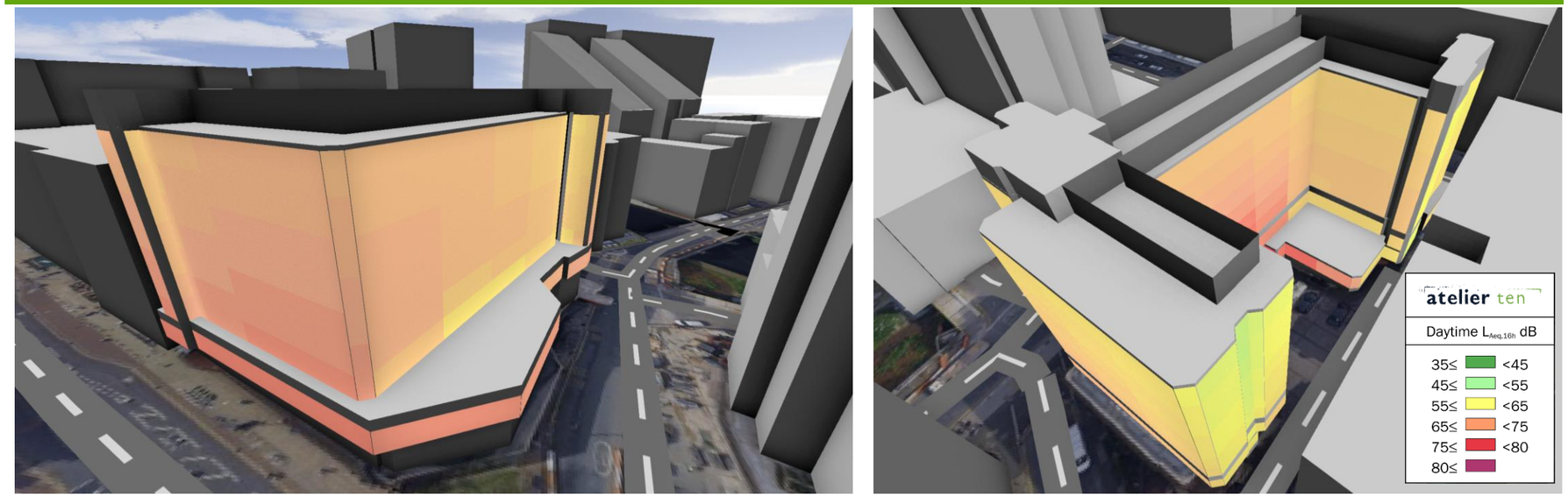
During the daytime, the proposed site is exposed to moderately high noise levels in the range of $L_{Aeq,T}$ 60 – 68 dB on hotel guestroom façades, with the highest noise exposure observed along the eastern elevations adjacent to Deansgate road.

Moderate noise levels are also observed to the south of the site on façades shielded from road noise. This can be attributed to existing plant items associated with the existing Ground Floor retail units.

4.2.2 Night-time noise levels

During the night-time, the proposed site is exposed to moderate noise levels in the range of $L_{Aeq,T}$ 55 – 64 dB on hotel guestroom façades, with the highest noise exposure observed along the eastern elevations adjacent to Deansgate road. As during the day, noise levels on the southern façade are also moderate due to MEP plant noise.

Daytime noise levels



Night-time noise levels

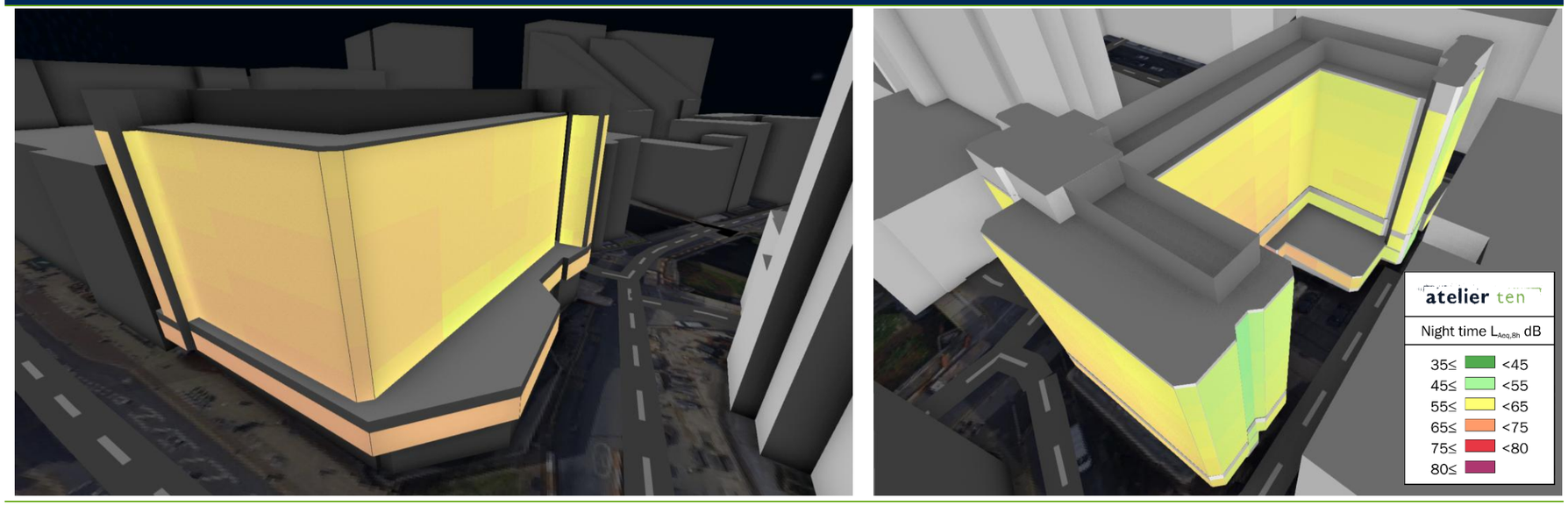


Figure 4.1 Daytime and noise-time noise levels—3D acoustic model

4.2.3 Maximum noise levels

During the night-time, the proposed site is exposed to high maximum instantaneous noise levels associated with loud vehicle pass-bys (e.g. motorbikes and blue-light emergency vehicles).

The potential impact of maximum noise level events is predicted to be up to $L_{AF,max}$ 87 dB on hotel guestroom façades, with the highest noise exposure observed along the eastern elevations adjacent to Deansgate road.

Maximum noise levels at night

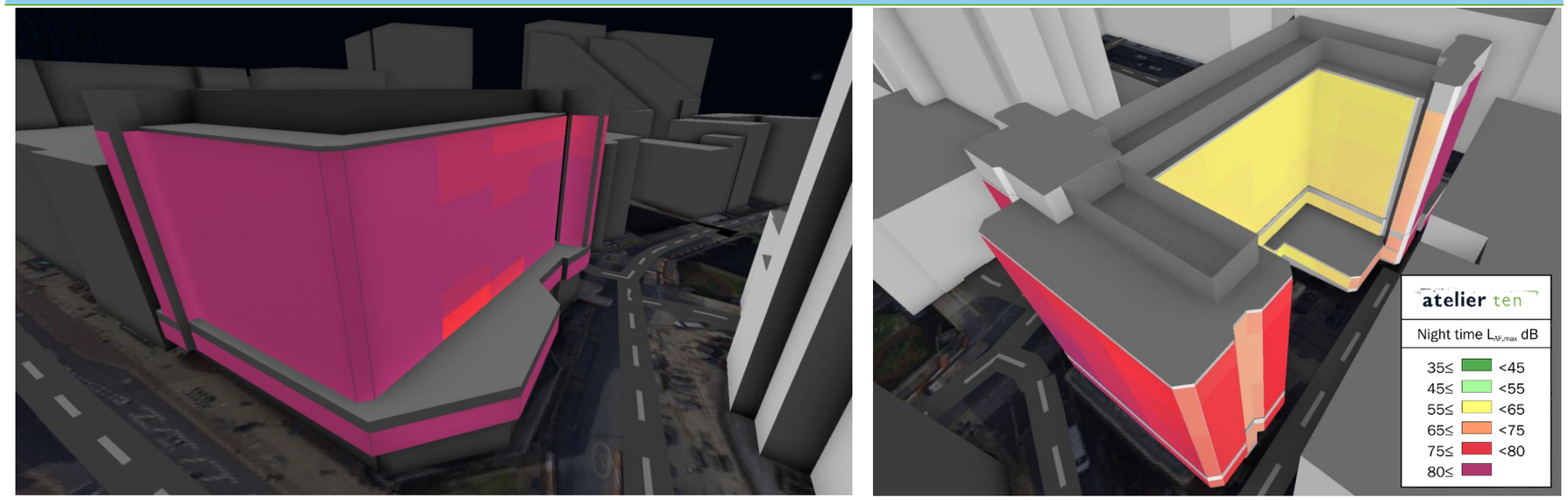


Figure 4.2 Night-time maximum instantaneous noise levels—3D acoustic model

5 Façade glazing & ventilation

Suitable internal ambient noise levels can be achieved by the appropriate design of façade glazing and ventilation systems. This section outlines the acoustic performance requirements of these elements.

5.1 Typical conditions

Façade noise break-in calculations have been undertaken to determine the level of façade sound insulation performance required to achieve internal ambient noise levels within hotel rooms in line with BS 8233 guidance, with relevance to ambient and maximum noise level criteria as outlined in Section 2.4.

Calculations have been undertaken on each elevation and rationalised into "conditions" to assist with buildability, procurement and cost. All efforts have been made to reduce material use in the interest of saving embodied carbon, however, the high noise levels experienced at the site impart the requirement for robust high performance glazing build-ups to achieve the acoustic criteria.

The calculations have been based on the typical dimensions of a proposed hotel room, as outlined in the current architectural information available in May 2026.

The calculation inputs including façade area, glazed area and room dimensions can be summarised in Figure 5.1.

5.2 Overheating condition

In terms of overheating, it is understood that the design intent is to provide mechanical ventilation and cooling to hotel rooms, and that openable windows **do not form** part of the ventilation or overheating strategy.

As such, the best practice overheating criteria for acoustics shall be met by the sealed façade. This means that the performance of the façade glazing system becomes the critical element in suitably controlling noise intrusion.

Given that the IANL targets for overheating are relaxed in comparison to the IANL criteria outlined in BS 8233 and Section 2.4.1 for typical operation, the acoustic criteria for overheating shall be met by default. It is understood that the mechanical ventilation units shall provide sufficient fresh air and cooling during overheating conditions to keep rooms sufficiently cool and ventilated year-round.

This strategy can be seen illustrated in Figure 5.2.

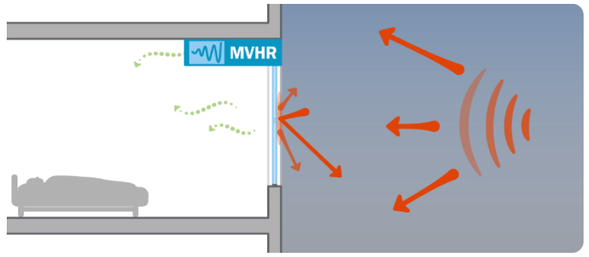


Figure 5.2 MVHR ventilation strategy with closed facade

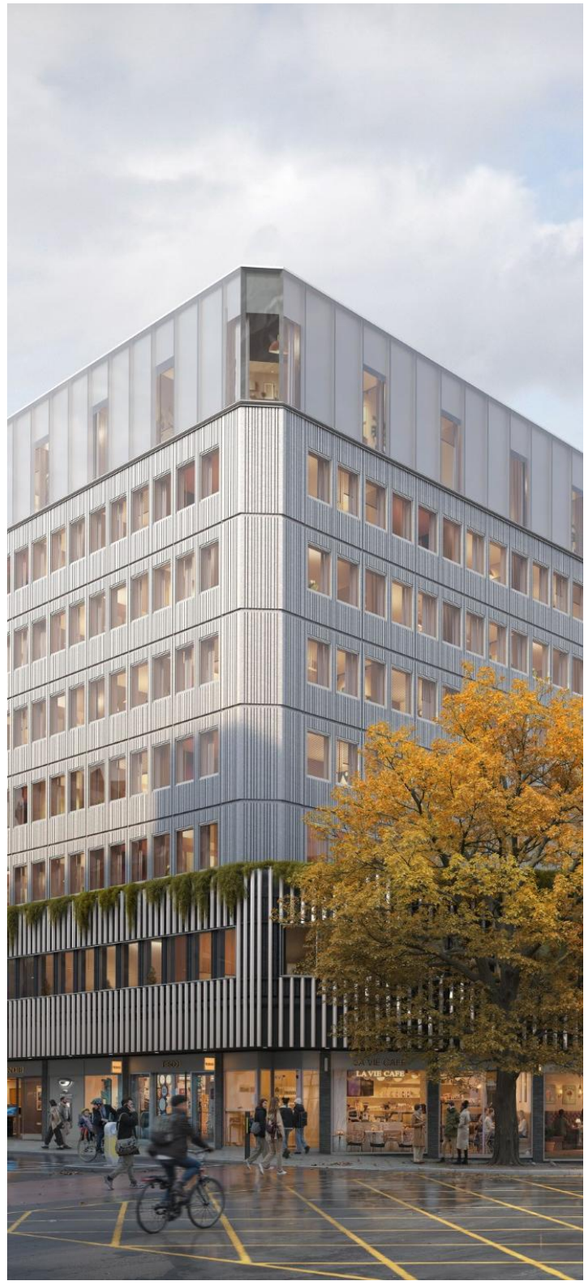
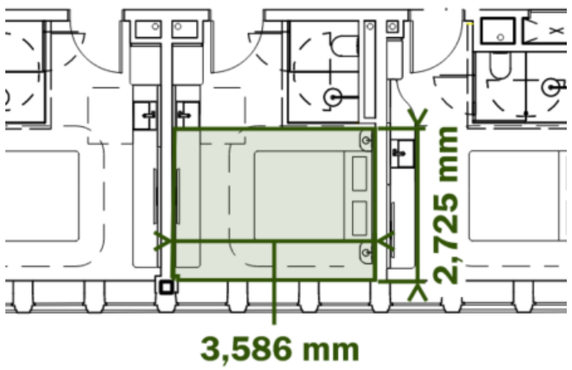
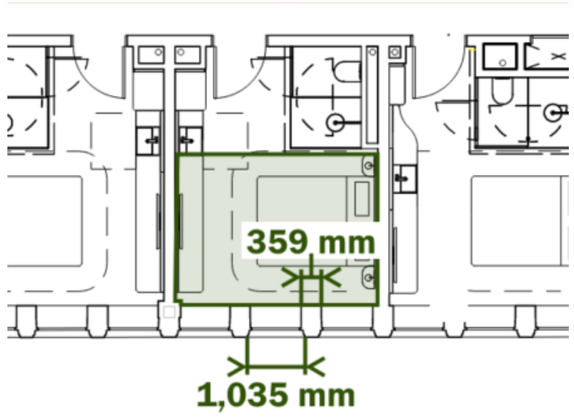


Figure 5.3 Proposed façade and extension (source: JMA)





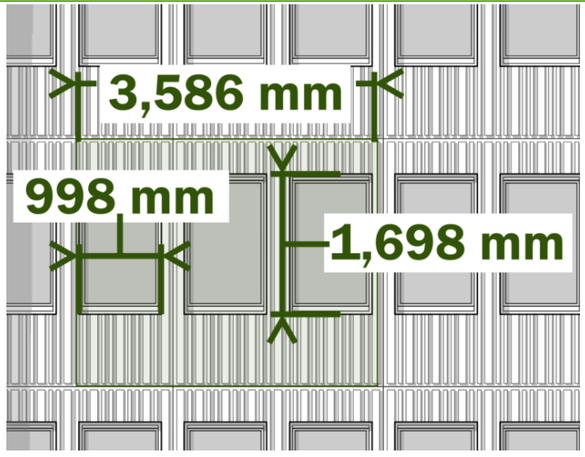


Figure 5.1 Façade glazing calculation—input dimensions

5.3 Glazing requirements

Within most traditionally built façades (which include masonry external walls and roofs), the weakest elements of the external elevation are the glazing and ventilation systems.

For this scheme, noise break-in through the ventilation systems is controlled through suitably attenuated ducting; therefore, the acoustically weakest element is the glazing.

The glazing attenuation required is a product of the external noise level to which a hotel room is exposed, and the internal targets for these (considering both average and short-duration noise events).

Whilst the internal targets are constant and well understood, in reality the external exposure does not only vary with time, but also varies significantly across elevations due to shielding, orientation, height and "view" of a combination of external noise sources. As such, there could be an almost-infinite number of glazing specifications required, but it is normally considered good practice to streamline these into fewer types to control buildability, aesthetics, loading and economy of scale in terms of purchasing.

Correspondingly, three types of glazing systems are proposed for the scheme. Table 5.1 provides the minimum sound insulation performances per octave band required for each category and Figure 5.5 illustrates where they each apply. Any alternative solution should be verified against the proposed octave-band performance values above and either meet or exceed the R-value at each of these listed frequency bands (125 Hz – 4000 Hz) as a minimum.

These specifications are based on achieving the targeted internal noise levels specified in Section 2.4, and on the external noise levels modelled in Section 4. Example calculations are provided in Appendix A.

5.3.1 Bar noise levels

It is anticipated that noise levels within the bar are unlikely to be excessive, given that there exists a direct adjacency to hotel rooms above.

As such, the specified performance requirements for external noise break-in shown in Condition 3 are also considered sufficient to control music noise from the bar to suitable levels at the NSR—based on distance attenuation and the performance of the glazing.

For example:

- Assuming a recommended noise level of no greater than LpA 95 dB within the bar space (considered to be a reasonable worst-case given the proximity to guestrooms)
- Approximate reduction through the façade of 29 dB
- Approximate distance attenuation over 25 metre distance to the Treehouse Hotel Manchester = at least 20 dB
- Approximate resultant noise level = 95-29-20 = LpA 46 dB at 1 metre from the window of the nearby NSR
- This result is at least 5 dB below the representative daytime background noise level at the NSR as shown in Table 6.1
- As mentioned above, due to the direct adjacency to hotel rooms within the Maybrook House, it is a fair assumption that no loud music would be proposed during night-time hours in the interest of sleep disturbance and guest satisfaction.

Table 5.1 Façade glazing sound reduction index requirements—per condition

Condition	Sound reduction indices (dB) at octave-band centre frequencies (Hz)						$R_w + C_{tr}$ (dB)	Example glazing construction
	125	250	500	1k	2k	4k		
1	28	39	44	44	48	61	Rw + Ctr 39 dB	8 mm float glass / 16 mm air cavity / 10.5 mm acoustic laminated glass
2	27	28	35	45	50	56	$R_w + C_{tr}$ 36 dB	6.4 mm acoustic laminated glass / 9 mm air cavity / 10.4 mm acoustic laminated glass
3	19	22	32	42	39	39	$R_w + C_{tr}$ 29 dB	4 mm float glass / 24 mm air cavity / 6 mm float glass

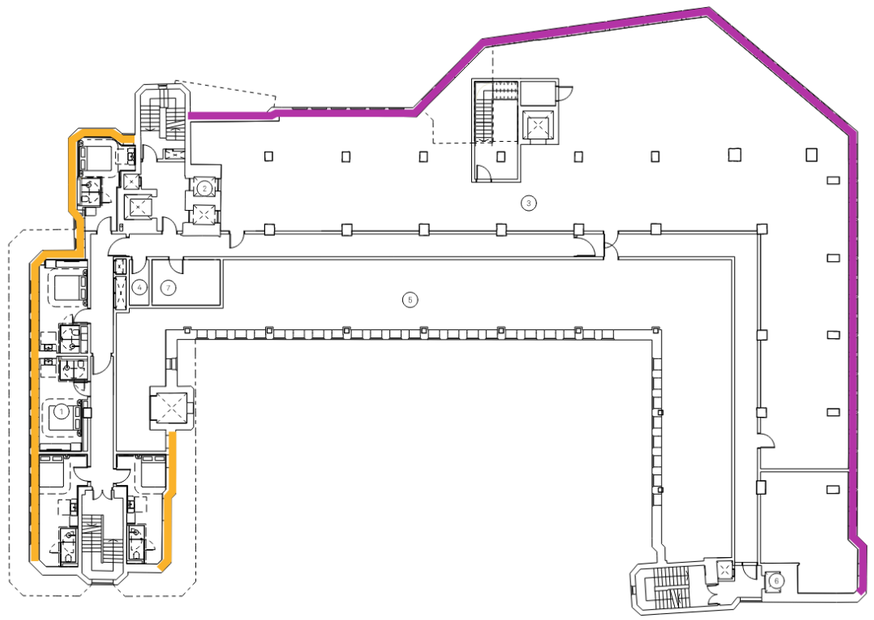


Figure 5.4 Level 01 façade conditions mark-up— bar, lobby and Level 01 guestrooms

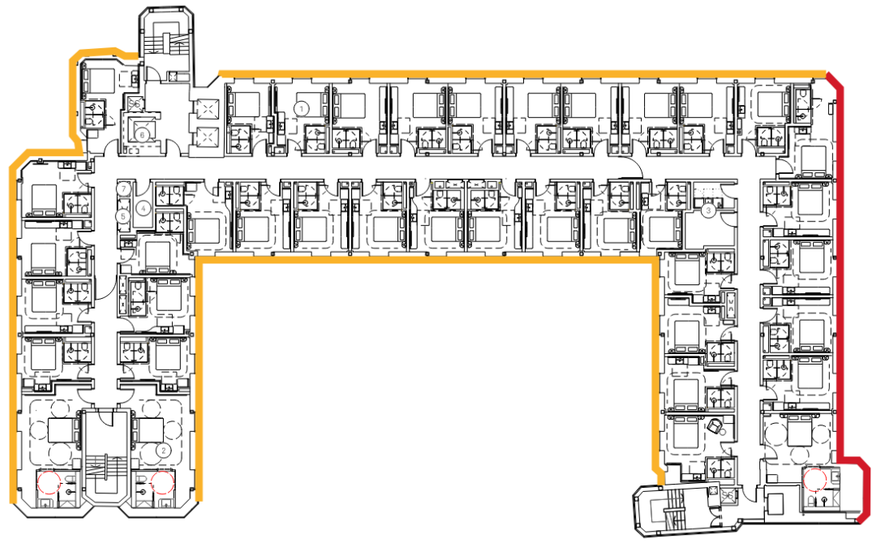


Figure 5.5 Level 02 — Level 07 façade conditions mark-up—guestrooms

6 Plant Noise Limits

Any new development must be designed such that noise levels at nearby existing noise sensitive receptors do not unduly increase as a result of newly proposed MEP plant equipment.

6.1 Limiting plant noise levels

Plant noise limits have been derived from measurement data taken at position LT1.

LT1 is a more shielded, rooftop measurement location which captures noise levels which are considered more representative and worst-case for the NSR assessment—as opposed to LT2 which experiences higher noise levels due to direct exposure to Deansgate road.

As can be observed, noise levels at this location are consistently quiet for the majority of time. However, a significant spike in noise level to 57-58 dB can be observed during specific time periods. This is understood to be a result of intermittent plant items switching on for periods of the day. This indicates that the NSR is likely already exposed to significant noise impact from plant during the daytime.

The acoustic intent for this project is to design any the plant atop the Maybrook House roof to below the existing background noise levels, such that cumulative noise creep can be avoided.

As such, in the interest of reducing noise creep, and considering the existing prominence of noise from plant items, plant noise limits are proposed at 5 dB below the representative background noise level at the nearby NSRs, as outlined in Table 6.1 This is understood to be in line with MCC noise guidelines and policies as agreed with the EHO in March 2026.

Table 6.1 Plant noise limits - typical operation

Period	Measured representative background noise level $L_{A90,T}$ (dB)	Plant noise rating limit $L_{Ar,Tr}$ (dB) at the NSR
Daytime period	52	47
Night-time period	48	43

6.1.1 Generator noise limits

It is understood that a generator is proposed as part of the Maybrook House development.

As advised by the MEP engineers, the generator is only to run during the following situations:

1. Emergency scenarios
2. Scheduled testing.

From discussion with MCC, as covered in Section 2.3, it is understood that a noise limit of +10 dB above the representative background noise level at NSR can be accepted, due to the emergency only nature of the generator.

Generator noise limits are summarised in Table 6.2.

MCC have advised, as covered in Section 2.3, that a clear testing schedule should be made available to nearby tenants and NSRs to reduce the potential noise disturbance of any testing undertaken.

Atelier Ten advise that generator testing should also take place during the least noise sensitive hours of the day, e.g. during the middle of the day on weekdays only, avoiding by all costs any testing during early morning, evening or night-time periods and on weekends.

Table 6.2 Plant noise limits - emergency only

Period	Measured representative background noise level $L_{A90,T}$ (dB)	Plant noise rating limit $L_{Ar,Tr}$ (dB) at the NSR
Daytime period	52	62
Night-time period	48	58

6.2 Design and mitigation

6.2.1 Provisional limit at source

MEP plant information is understood to be provisional at RIBA Stage 2, to be further developed as the design progresses.

As a helpful guideline for selecting early-stage placeholder plant items capable of achieving the plant noise limits outlined in this section, Atelier Ten have proposed an approximate "rule of thumb" noise limit at 1 metre from each unit. This is based on the following assumptions:

- The current understanding is that there are approximately:
  - 9 major plant items (ASHPs, AHUs) atop the roof
  - 2 locations where rooftop smoke fans are proposed
- A total of 6 intake/exhaust louvres at Level 01
- A safe robust assumption therefore at this stage is a total of 20 noise generating plant items/terminations located externally
- Worst-case distance attenuation to the nearest NSR (Treehouse Hotel Manchester) of approx. 35 metres
- This provisional guideline also does not account for any screening provided by barriers, or buildings, and therefore represents a worst-case scenario in a hotel room directly overlooking the roof.

Based on the above, Atelier Ten recommend a limit of L_{pA} 61 dB at 1m for each item of plant is taken as a high-level guide at this stage.

This guideline is provided for night-time. Taking account higher background noise levels during the day, this guide may be able to be relaxed by up to 4 dB per plant item (LpA 61 dB at 1m for items which operated daytime only).

This information should not be taken as a specification, and is only provided to assist MEP engineers in the early selection of plant units. The final plant noise impact requires detailed verification once final unit selections are made, with proposed locations and any mitigation measures (e.g. perimeter plant screens) in place. It is proposed that a full and detailed assessment of specified plant items is undertaken at a following design stage.

6.2.2 Mitigation measures

It is expected that noise from mechanical plant can be controlled to satisfy the design criteria by selecting low noise plant items and with the selection of suitable noise mitigation measures.

These could include but are not limited to, atmosphere-side attenuators, duct lagging and mass barrier screens, examples of these can be seen in Figure 6.1 — Figure 6.4.

Required mitigation measures will be coordinated as the MEP design is developed further and plant selections are finalised at later design stages.

R_w C_{tr}

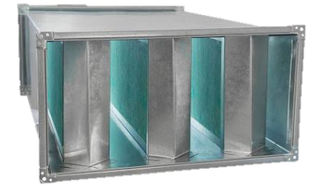


Figure 6.1 Rectangular attenuator

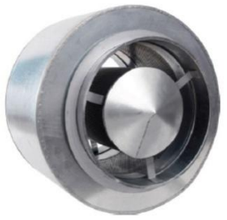


Figure 6.2 Circular attenuator



Figure 6.3 Duct lagging



Figure 6.4 Noise barrier with acoustic lining

7 Conclusions

In summary, this report assesses the existing noise climate at the project site and proposes suitable design strategies to control noise break-in to bedrooms and to limit noise emissions to nearby noise sensitive receptors.

This report outlines:

- The results of a long-term noise survey undertaken at the site
- The results of a detailed 3D modelling assessment calibrated on to on-site measured noise levels
- Pertinent design criteria in line with acoustic best practice, national and local guidelines
- Suitable façade sound insulation performance requirements, rationalised into three conditions, to achieve target internal ambient noise levels in line with BS 8233 across all elevations of the proposed development
- The requirements to comply with Approved Document O during the overheating condition
- Suitable plant noise limits in line with MCC guidance
- Provisional mitigation measures and guideline targets for design plant items in line with the proposed plant noise limits.

Based on the above, noise is not considered to form a barrier to the development of the proposed Maybrook House.

Appendices

Appendix A Façade sound reduction index calculations
A.1 Deansgate facing bedroom
A.2 Blackfriars Street facing bedroom
A.3 Rear courtyard facing bedroom
A.4 Level 01 bar

Appendix A Façade sound reduction index calculations

A.1 Deansgate facing bedroom

FAÇADE BREAK-IN CALCULATION												
Project Name	Maybrook House											
Room or space	Deansgate											
Date	28042026											
ROOM CONSTANT & FAÇADE AREA												
Façade area (incl. window)	*9.3 m2*	**Area of the external wall**	5 m2	**Room reverberation time (s)**								
Area of the louver	*0.0 m2*			Tmf	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz		
Area of the windows	*4.3 m2*			0.5	0.7	0.6	0.5	0.5	0.5	0.5		
Area of the roof/ceiling	*9.5 m2*	**Area of exposed envelope**	19 m2									
Room Depth (x)	*2.7 m*											
Room Width (y)	*3.5 m*	**Room Volume**	25 m3									
Ceiling height (z)	*2.7 m*											
DISTANCE ATTENUATION CALCULATION												
Distance correction	*No*	**Calculated Distance Attenuation**	-									
Type of distance correction	*Point source*											
Distance from source to microphone	-											
Distance from source to receiver	-											

FREE FIELD LEVELS AT 1m FROM THE NOISE SENSITIVE FAÇADE								
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAeq	Free Field Leq in octave bands (dB)	64	61	59	62	61	56	50
	Resultant Free-Field Leq with distance attenuation (dB(A))	64	61	59	62	61	56	50
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAmax (if applicable)	Free Field Lfmax in octave bands	86	88	84	82	82	78	73
	Resultant Free-Field LAmax with distance	86	88	84	82	82	78	73

SOUND REDUCTION PROPERTIES OF BUILDING ELEMENTS										
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	R_w	$R_w+C_{T_r}$ (dB)
Window (R_w)	*Rw+Ctr 39dB SGG 8/16/16 PVB interlayer (2no.)*	28	36	39	45	46	58	44	39
Louver (Rw)	*No Louver*	0	0	0	0	0	0	0	0
External wall Construction (Rw)	*Typical external wall construction*	46	44	46	54	62	67	52	49
Roof Construction (Rw)	*Typical roof construction*	99	99	99	99	99	99	99	99
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	$D_{n,ew}$ (dB)	
Trickle Vent ($D_{n,e,w}$)	*No Vent* — 0 Units	200	200	200	200	200	200	-	

CALCULATED INTERNAL LAeq AND LAF,max LEVELS							
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	
Calculated LAeq in the receiver room (dB)	35	25	24	17	11	-7	
Calculated LAFmax in the receiver room (dB)	57	46	40	34	29	13	

L_{Aeq} (125-4000Hz)	L_{Amax} (125-4000Hz)
25 dB(A)	**44 dB(A)**

A.2 Blackfriars Street facing bedroom

FAÇADE BREAK-IN CALCULATION												
Project Name	Maybrook House											
Room or space	Blackfriars Street											
Date	28042026											
ROOM CONSTANT & FAÇADE AREA												
Façade area (incl. window)	*9.3 m2*	**Area of the external wall**	5 m2	**Room reverberation time (s)**								
Area of the louver	*0.0 m2*			Tmf	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz		
Area of the windows	*4.3 m2*			0.5	0.7	0.6	0.5	0.5	0.5	0.5		
Area of the roof/ceiling	*9.5 m2*	**Area of exposed envelope**	19 m2									
Room Depth (x)	*2.7 m*											
Room Width (y)	*3.5 m*	**Room Volume**	25 m3									
Ceiling height (z)	*2.7 m*											
DISTANCE ATTENUATION CALCULATION												
Distance correction	*No*	**Calculated Distance Attenuation**	-									
Type of distance correction	*Point source*											
Distance from source to microphone	-											
Distance from source to receiver	-											

FREE FIELD LEVELS AT 1m FROM THE NOISE SENSITIVE FAÇADE								
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAeq	Free Field Leq in octave bands (dB)	60	57	55	58	57	52	46
	Resultant Free-Field Leq with distance attenuation (dB(A))	60	57	55	58	57	52	46
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAmax (if applicable)	Free Field Lfmax in octave bands	84	86	82	80	80	76	71
	Resultant Free-Field LAmax with distance	84	86	82	80	80	76	71

SOUND REDUCTION PROPERTIES OF BUILDING ELEMENTS										
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	R_w	$R_w+C_{T_r}$ (dB)	
Window (R_w)	*Rw+Ctr 36dB SGG 6.4 (Stadip Silence)/9/10.4 (Stadip Silence)*	27	28	35	45	50	56	41	36	
Louver (Rw)	*No Louver*	0	0	0	0	0	0	0	0	
External wall Construction (Rw)	*Typical external wall construction*	46	44	46	54	62	67	52	49	
Roof Construction (Rw)	*Typical roof construction*	99	99	99	99	99	99	99	99	
		125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	$D_{n,ew}$ (dB)		
Trickle Vent ($D_{n,e,w}$)	*No Vent* — 0 Units	200	200	200	200	200	200	-		

CALCULATED INTERNAL LAeq AND LAF,max LEVELS						
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Calculated LAeq in the receiver room (dB)	32	28	24	13	3	-9
Calculated LAFmax in the receiver room (dB)	56	51	42	32	23	12

L_{Aeq} (125-4000Hz)	L_{Amax} (125-4000Hz)
24 dB(A)	**45 dB(A)**

A.3 Rear courtyard facing bedroom

FAÇADE BREAK-IN CALCULATION												
Project Name	Maybrook House											
Room or space	South Façade											
Date	28042026											
ROOM CONSTANT & FAÇADE AREA												
Façade area (incl. window)	*9.3 m2*	**Area of the external wall**	5 m2	**Room reverberation time (s)**								
Area of the louver	*0.0 m2*			Tmf	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz		
Area of the windows	*4.3 m2*			0.5	0.7	0.6	0.5	0.5	0.5	0.5		
Area of the roof/ceiling	*9.5 m2*	**Area of exposed envelope**	19 m2									
Room Depth (x)	*2.7 m*											
Room Width (y)	*3.5 m*	**Room Volume**	25 m3									
Ceiling height (z)	*2.7 m*											
DISTANCE ATTENUATION CALCULATION												
Distance correction	*No*	**Calculated Distance Attenuation**	-									
Type of distance correction	*Point source*											
Distance from source to microphone	-											
Distance from source to receiver	-											

FREE FIELD LEVELS AT 1m FROM THE NOISE SENSITIVE FAÇADE								
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAeq	Free Field Leq in octave bands (dB)	66	63	61	64	63	58	52
	Resultant Free-Field Leq with distance attenuation (dB(A))	66	63	61	64	63	58	52
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAmax (if applicable)	Free Field Lfmax in octave bands	66	68	64	62	62	58	53
	Resultant Free-Field LAmax with distance	66	68	64	62	62	58	53

SOUND REDUCTION PROPERTIES OF BUILDING ELEMENTS										
			125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	R_w	$R_w+C_{T_r}$ (dB)
Window (R_w)	*Rw+Ctr 36dB SGG 6.4 (Stadip Silence)/9/10.4 (Stadip Silence)*		27	28	35	45	50	56	41	36
Louver (Rw)	*No Louver*		0	0	0	0	0	0	0	0
External wall Construction (Rw)	*Typical external wall construction*		46	44	46	54	62	67	52	49
Roof Construction (Rw)	*Typical roof construction*		99	99	99	99	99	99	99	99
			125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	$D_{n,ew}$ (dB)	
Trickle Vent ($D_{n,e,w}$)	*No Vent*	0 Units	200	200	200	200	200	200	-	

CALCULATED INTERNAL LAeq AND LAF,max LEVELS						
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Calculated LAeq in the receiver room (dB)	38	34	30	19	9	-3
Calculated LAFmax in the receiver room (dB)	38	33	24	15	5	-6

L_{Aeq} (125-4000Hz)	L_{Amax} (125-4000Hz)
30 dB(A)	**28 dB(A)**

A.4 Level 01 bar

FAÇADE BREAK-IN CALCULATION												
Project Name	Maybrook House											
Room or space	Bar											
Date	28042026											
ROOM CONSTANT & FAÇADE AREA												
Façade area (incl. window)	*126.0 m2*	**Area of the external wall**	25 m2	**Room reverberation time (s)**								
Area of the louver	*0.0 m2*			Tmf	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz		
Area of the windows	*100.8 m2*			1.0	1.0	1.0	1.0	1.0	1.0	1.0		
Area of the roof/ceiling	*399.0 m2*	**Area of exposed envelope**	#####									
Room Depth (x)	*34.4 m*											
Room Width (y)	*11.6 m*	**Room Volume**	#####									
Ceiling height (z)	*2.8 m*											
DISTANCE ATTENUATION CALCULATION												
Distance correction	*No*	**Calculated Distance Attenuation**	-									
Type of distance correction	*Point source*											
Distance from source to microphone	-											
Distance from source to receiver	-											

FREE FIELD LEVELS AT 1m FROM THE NOISE SENSITIVE FAÇADE								
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAeq	Free Field Leq in octave bands (dB)	67	64	62	65	64	59	53
	Resultant Free-Field Leq with distance attenuation (dB(A))	67	64	62	65	64	59	53
		dB(A)	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
LAmax (if applicable)	Free Field Lfmax in octave bands	88	90	86	84	84	80	75
	Resultant Free-Field LAmax with distance	88	90	86	84	84	80	75

SOUND REDUCTION PROPERTIES OF BUILDING ELEMENTS										
			125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	R_w	$R_w+C_{T_r}$ (dB)
Window (R_w)	*Rw+Ctr 29dB SGG 4/24/6*		19	22	32	42	39	39	35	29
Louver (Rw)	*No Louver*		0	0	0	0	0	0	0	0
External wall Construction (Rw)	*Typical external wall construction*		46	44	46	54	62	67	52	49
Roof Construction (Rw)	*Typical roof construction*		99	99	99	99	99	99	99	99
			125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	$D_{n,ew}$ (dB)	
Trickle Vent ($D_{n,e,w}$)	*No Vent*	0 Units	200	200	200	200	200	200	-	

CALCULATED INTERNAL LAeq AND LAF,max LEVELS						
	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz
Calculated LAeq in the receiver room (dB)	45	40	34	22	21	14
Calculated LAFmax in the receiver room (dB)	67	59	48	38	37	32

L_{Aeq} (125-4000Hz)	L_{Amax} (125-4000Hz)
36 dB(A)	**54 dB(A)**