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**Noise | Vibration | Air Quality**

# **Noise Impact Evaluation**

**The Barn Hotel, Ruislip**

# Noise Impact Evaluation

**Project:** THE BARN HOTEL, RUISLIP

**Report reference:** RP01-22530-R7

**Client:** CHASE NEW HOMES  
8 PARKWAY  
WELWYN GARDEN CITY  
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**Our details:** CASS ALLEN ASSOCIATES LTD

## Document control:

REVISION	ISSUE DATE	REPORT BY	CHECKED BY	NOTES
0	22 December 2022	Cian Grunfeld, MSc BEng, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Initial Issue
1	03 January 2023	Cian Grunfeld, MSc BEng, Acoustics Consultant	Chris McNeillie, MSc CEng MIOA, Director	Updated report layout
2	09 March 2023	Cian Grunfeld, MSc BEng, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Update following comments
3	12 August 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Revised following updated layout
4	13 August 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Minor changes on the above
5	21 August 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Ronny Ospina Orozco, MSc MIOA, Senior Acoustics Consultant	Revised following updated layout
6	09 September 2024	Annamarie Schooling, BA (Hons) TechIOA, Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Updated local policies
7	03 March 2026	Benjamin Briggs, BSc (Hons), Acoustics Consultant	Sam Bryant, MPhys CEng MIOA, Director	Updated layout and assessment

## **TABLE OF CONTENTS**

1. EXECUTIVE SUMMARY
2. INTRODUCTION
3. PROJECT DESCRIPTION
4. PLANNING POLICY
5. NOISE AFFECTING THE DEVELOPMENT
6. CONCLUSIONS

**APPENDIX 1** SITE LAYOUT

**APPENDIX 2** SURVEY RESULTS

**APPENDIX 3** MODELLING RESULTS

**APPENDIX 4** FACADE NOISE INGRESS CALCULATIONS

**APPENDIX 5** PART O ACOUSTIC REQUIREMENTS FOR BEDROOMS AT NIGHT

## **1. EXECUTIVE SUMMARY**

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- 1.1 Cass Allen has been instructed by Chase New Homes to assess the noise impact of the proposed development at The Barn Hotel, Ruislip.
- 1.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 1.3 A noise survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from West End Road and railway noise emissions from Ruislip Underground Station.
- 1.4 Noise affecting the development has been assessed in accordance with ProPG guidance. The design of the development is considered to be acceptable subject to the adoption of acoustically upgraded glazing and ventilation. This can be investigated further at the detailed design stage.
- 1.5 Advice has been provided in regard to Building Regulations Part O to assist the overheating assessment. Bedrooms facing West End Road and the railway will need to be designed so that windows can remain closed at night without the rooms overheating. This can be assessed further in due course.
- 1.6 In summary of the above it is our view that the site is suitable for the development in terms of noise levels and that planning permission should be granted.

## 2. INTRODUCTION

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- 2.1 The assessment has been carried out in accordance with relevant local and national planning guidance.
- 2.2 The aims of the assessment were:
- To establish the suitability of existing noise levels at the site for the proposed development;
  - Where required, identify appropriate measures to optimise the acoustic design of the development and achieve acceptable noise levels in habitable areas.
- 2.3 This report contains technical terminology; a glossary of terms can be found at [www.cassallen.co.uk/glossary](http://www.cassallen.co.uk/glossary).

### 3. PROJECT DESCRIPTION

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- 3.1 The site currently contains The Barn Hotel and is located in a residential area, bounded to the east by properties on Eversley Crescent and to the west by West End Road. To the north of the site is Ruislip Underground Station and railway line and a Waitrose supermarket beyond the railway line.
- 3.2 The site location is shown in Figure 1 below.

**Figure 1 Site Location and Surrounding Area**



- 3.3 The proposal is to develop the site into 7 residential blocks. The two existing listed buildings in the centre of the site will remain and be used for residential purposes. The proposed site layout is presented in Appendix 1.

## 4. PLANNING POLICY

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### National Policy

- 4.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Relevant sections in this case are highlighted below:

*187. Planning policies and decisions should contribute to and enhance the natural and local environment by ... preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of ...noise pollution.*

*198. 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:*

*a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*

*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.*

### Local Policy

- 4.2 The London Plan – *The Spatial Development Strategy for Greater London* (March 2021) Chapter 3 states that:

*3.13.10 Noise and other impact assessments accompanying planning applications should be carefully tailored to local circumstances and be fit for purpose. That way, the particular characteristics of existing uses can be properly captured and assessed. [...] Boroughs should pay close attention to the assumptions made and methods use in impact assessments to ensure a full and accurate assessment.*

- 4.3 The plan also outlines Policy D14 Noise, which states:

*In order to reduce, manage and mitigate noise to improve health and quality of life, residential and other non-aviation development proposals should manage noise by:*

*1) avoiding significant adverse noise impacts on health and quality of life*

*2) reflecting the Agent of Change principle as set out in Policy D13 Agent of Change*

*3) mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restrictions on existing noise-generating uses*

*4) improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquillity)*

*5) separating new noise-sensitive development from major noise sources (such as road, rail, air transport and some types of industrial use) through the use of distance, screening, layout, orientation, uses and materials – in preference to sole reliance on sound insulation*

*6) where it is not possible to achieve separation of noise-sensitive development and noise sources without undue impact on other sustainable development objectives, then any potential adverse effects should be controlled and mitigated through applying good acoustic design principles*

*7) promoting new technologies and improved practices to reduce noise at source, and on the transmission path from source to receiver*

4.4 Hillingdon Council's Local Plan Document – *Strategic Policies* (November 2012) Policy EM8 states that:

*“The council will seek to ensure that noise sensitive development ... are only permitted if noise impacts can be adequately controlled and mitigated.”*

4.5 To address the requirements of the national and local policies, noise affecting the habitable areas of the proposed development has been assessed.

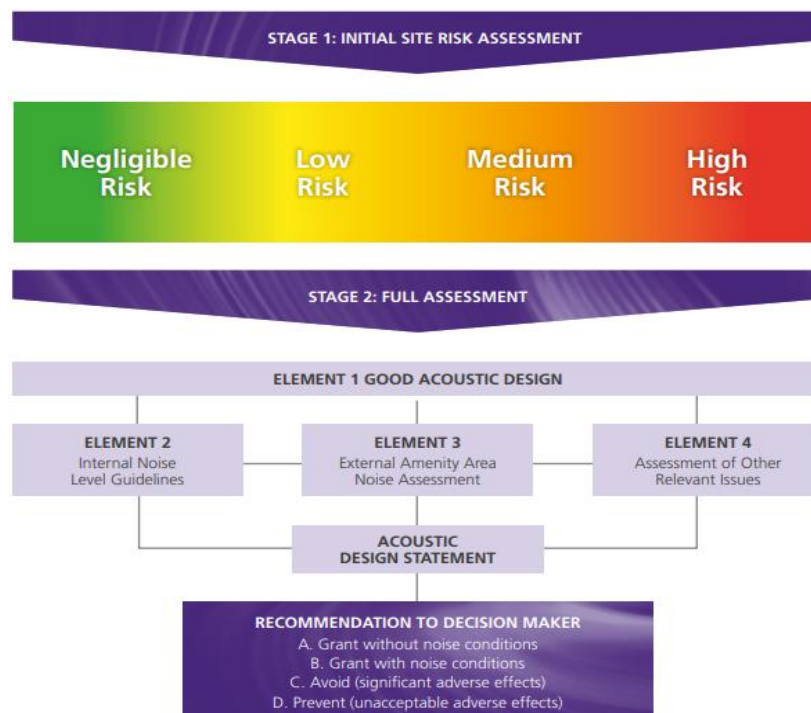
## 5. NOISE AFFECTING THE DEVELOPMENT

5.1 Specific guidance on the assessment of noise affecting new residential development is given in ProPG – *Planning and Noise for New Residential Development, May 2017* (ProPG). The process within the ProPG guidance for the appraisal of noise levels affecting new residential development is considered to be current ‘best practice’ and has, therefore, been followed for the assessment of the new blocks. The assessment process can be summarised as follows:

- Stage 1 – measure noise levels at the site and carry out an initial noise risk assessment of the proposed development site based on the measured levels.
- Stage 2 – where a higher noise risk is identified, carry out a detailed assessment including the following four considerations:
  - Element 1 – the overall acoustic design and layout of the site
  - Element 2 – internal noise levels in habitable areas
  - Element 3 – noise levels in external amenity areas
  - Element 4 – consideration of other relevant issues
- Based on the results of the Stage 2 assessment, provide a recommendation to the decision maker on whether planning permission can and should be granted.

5.2 The process is shown in Figure 2 below.

**Figure 2 ProPG Assessment Process**



- 5.3 It should be noted that the guidance in ProPG relates primarily to noise from transportation sources, i.e. road traffic, aircraft, rail etc. Any significant noise from other sources (e.g. industrial, commercial or entertainment sources) is outside the scope of the ProPG guidance and, therefore, requires separate consideration. In this case, there are no commercial noise sources affecting the site and therefore only transportation noise has been considered.
- 5.4 The noise affecting the existing buildings to remain is assessed separately to the proposed new buildings in Stage 2 Element 2b below.

### **Stage 1 – Noise survey and initial assessment**

- 5.5 A noise survey was carried out at the site from 6<sup>th</sup> to 14<sup>th</sup> December 2022 to measure existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.
- 5.6 Average noise levels (LAeq) across the site were generally dictated by road traffic on West End Road. Average noise levels at the northern edge of the site were also affected by railway noise from Ruislip Underground station.
- 5.7 Maximum noise levels (LAmax) at the north of the site were dictated by a combination of vehicle movements on West End Road and train arrivals and departures at Ruislip Underground station. Maximum noise levels at the south and western edges of the site were generally dictated by vehicle movements on West End Road.
- 5.8 Background noise levels (LA90) across the site were dictated by constant road traffic noise from the West End Road.
- 5.9 Measurements taken inside the existing buildings to remain were dictated by road traffic on West End Road and patron noise within the hotel.
- 5.10 Noise was also identified from aircraft movements; however, noise from aircraft was sporadic and low-level when compared with noise from road traffic and the railway.
- 5.11 Boundaries of the development at the northern and western edges of the site will be subject to the highest noise levels. The noise survey results show that noise levels at these positions are as follows:
- Western edge of the site facing West End Road:
    - Average noise levels during the daytime - 66 dB LAeq,0700-2300hrs;
    - Average noise levels during the night-time - 60 dB LAeq,2300-0700hrs;
    - Typical maximum noise levels during the night-time - 77 dB LAmax.
  - Northern edge of the site facing Ruislip Underground station:
    - Average noise levels during the daytime - 57 dB LAeq,0700-2300hrs;
    - Average noise levels during the night-time - 50 dB LAeq,2300-0700hrs;
    - Typical maximum noise levels during the night-time - 79 dB LAmax.

- 5.12 Based on the results of the site noise survey, a 3D computer noise model was developed to predict and assess the noise levels that will exist across the entire development.
- 5.13 The 3D noise model was developed using Cadna/A v2026 MR1 environmental noise modelling software. Cadna/A incorporates the calculation methodology outlined in the Department of Transport Welsh Office - Calculation of Road Traffic Noise (CRTN) for the assessment of road traffic noise propagation, CRN for rail noise.
- 5.14 The layout of the development and surrounding area was input into the model. To calculate the spread of noise levels around the site, day and night-time average noise levels were input for West End Road, the London Underground and calibrated to the results of the on-site noise measurements.
- 5.15 The methodology and results of the noise modelling are provided in Appendix 3.
- 5.16 The measured noise levels can be compared with Figure 3 below to assess the 'noise risk' of the site. Where the noise risk is high, significant acoustic design measures may be required to achieve acceptable noise levels in the development. Where the noise risk is low, acceptable noise levels may be achievable with no specific acoustic design measures.

**Figure 3 Noise Risk Assessment (Adaption of Figure 1 from ProPG)**



- 5.17 It can be seen from a comparison of the measured noise levels in paragraph 5.11 above with Figure 3 that the site is 'Medium' risk in relation to daytime noise levels and 'Medium-High' risk in relation to night-time noise levels. Therefore, ProPG requires that a more detailed 'Stage 2' assessment is carried out.

**Stage 2 – Element 1 – Overall acoustic design of the site**

- 5.18 The acoustic design of the development has been reviewed in relation to the measured noise levels at the site.
- 5.19 Acoustic treatment of the facades with noise mitigation is the preferred approach in this case as it allows more efficient use of the land available. This approach is in line with current planning guidance, where the efficient use of land and the need for housing is a priority.

## Stage 2 – Element 2a - Internal noise levels

5.20 ProPG states that appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 ‘*Guidance on sound insulation and noise reduction for buildings*’. Relevant design criteria are summarised in Table 1 below.

**Table 1 Internal Noise Criteria**

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Dining	Dining room/area	40 dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour 45 dB LAmax <sup>1</sup>

**Note 1:** ProPG states that “*In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB LAmax,F more than 10 times a night.*”

- 5.21 Therefore, the following acoustic design criteria have been adopted for the development:
- Average noise levels in living rooms and dining rooms during the day should not exceed 35 dB LAeq,0700-2300hrs and 40 dB LAeq,0700-2300hrs, respectively;
  - Average noise levels in bedrooms should not exceed 35 dB LAeq,0700-2300hrs during the day and 30 dB LAeq,2300-0700hrs during the night;
  - Maximum noise levels should not regularly exceed 45 dB LAmax in bedrooms during the night.
- 5.22 Full construction details for the development have not been finalised as the project is at an early design stage. It has therefore been assumed that the external walls of the development will be constructed using a standard masonry construction (e.g. 102mm brick, 100mm insulated cavity, 100mm concrete block) or a light-weight construction designed to achieve a similar level of sound insulation (this is technically achievable subject to detailed design). The existing buildings are also masonry although the details of glazing and wall construction are not currently known. Masonry construction provide high levels of sound insulation and consequently, internal noise levels in both the new and existing buildings would be dictated by external noise ingress via glazing and ventilators.
- 5.23 The ventilation strategy for the development has not yet been confirmed and therefore as a robust ‘worst-case’ assessment it is assumed that background ventilation will be provided via trickle ventilators in the building facade. For our calculations, two trickle ventilators are applied to bedrooms and three to living rooms.
- 5.24 Calculations were carried out using facade modelling software in accordance with the methodology given in BS8233:2014 to calculate the sound insulation performance required of the glazing and ventilation of the new build dwellings to achieve the nominated internal noise criteria in the ‘worst-

case' habitable rooms of the development (i.e. the habitable rooms that will be subject to the highest external noise levels).

- 5.25 If acceptable internal noise levels can be achieved in 'worst case' habitable rooms, then it follows that acceptable internal noise levels can be achieved in all other habitable rooms of the development using similar glazing and ventilator types.
- 5.26 The calculations were carried out based on the dimensions/details for facade elements taken from provided drawings.
- 5.27 The results of the calculations are shown in Appendix 3 and are summarised in Table 2 below.

**Table 2 Preliminary Acoustic Requirements for 'Worst Case' Habitable Rooms – New Buildings**

'Worst Case' Rooms	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements (in Open Position)
Bedrooms on the West End Road facade	37 dB Rw+Ctr	42 dB Dne,w + Ctr
Bedrooms on the Railway Facade	39 dB Rw+Ctr	45 dB Dne,w + Ctr
Living rooms on the West End Road and Railway facade	34 dB Rw+Ctr	38 dB Dne,w + Ctr

**Note** The requirements given are approximate only and should be confirmed at the detailed design stage when full design details are available.

- 5.28 The required sound insulation performance values in Table 2 could typically be achieved by the glazing and ventilator types shown in Table 3.

**Table 3 Typical Glazing and Ventilator Acoustic Performances**

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
High acoustic performance double glazing	34
High acoustic performance double glazing	37
Very High acoustic performance double glazing	39
Example Ventilators	Typical Acoustic Performance (Dnew + Ctr)
Greenwood 5000EAW.AC2 (vent + 2 acoustic module – external & internal)	38
Passivent AL-dB 800 air supply window vent	42
Brookvent Tunal SUS 290-10	45

**Note 1** The acoustic performance of the glazing systems (including frames) should always be confirmed with the manufacturer before selection for installation on site.

**Note 2** Where a higher rated glazing has been specified, the overall performance will be limited by the frames, therefore test data for the whole system should be used, rather than just glazing alone.

- 5.29 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the installation of suitable glazing and ventilation systems at the detailed design stage. It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the habitable rooms.
- 5.30 It should be noted that it will be possible to use lower acoustic performance glazing and ventilators for habitable rooms on facades that are further from or acoustically screened from the surrounding noise sources. This can be investigated further at the detailed design stage.
- 5.31 The above ProPG assessment for planning purposes is based on internal noise levels with windows closed (assumed to be “normal” circumstances). However, it is anticipated that residents may open their windows at times for thermal comfort (e.g. to prevent overheating in warmer months). Noise levels in the rooms will increase under these circumstances. Part O of the Building Regulations (Approved Document O), which came into effect on 15 June 2022 states:

*In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).*

*Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.*

*a. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).*

*b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).*

- 5.32 The results of the noise model indicate that areas of the development facing the railway and West End Road may exceed the noise limits provided in Approved Document O when the windows are opened. The overheating assessment is therefore not likely to be able to rely solely on open windows in these areas.
- 5.33 The areas in which open windows will need to be avoided (or a limit set on the open area of the window) will need to be confirmed as part of the overheating assessment during the detailed design stage. As an indication, a preliminary assessment regarding facades where windows can be assumed to be fully open, partially open or not open at all can be found in Appendix 5.

## **Stage 2 – Element 2b - Internal noise levels – existing buildings**

- 5.34 Noise levels in the existing listed buildings have been measured as part of the site noise survey and were found to be in line with the assessment criteria given above. Therefore, noise levels are at this stage considered to be suitable in these buildings for the proposed residential development with no changes to the building envelope.
- 5.35 This assessment is based on the current internal layout of the existing buildings. This can be assessed further at a later stage, as the design develops.

## Stage 2 – Element 4 – Noise levels in external amenity areas

- 5.36 ProPG/BS8233 state that it is desirable that noise levels in external amenity areas of residential developments do not exceed 50 dB LAeq and that 55 dB LAeq,T should be regarded as an upper guideline value. However, the guidance recognises that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources. In these cases, the guidance states that the development should be designed to achieve the lowest practicable noise levels in the amenity spaces.
- 5.37 Noise levels on balconies of Blocks C and K overlooking West End Road are anticipated to exceed the recommended levels by up to 5-10 dB. Whilst this is not ideal, in our view, exceeding the recommended levels would not mean that balconies would be unacceptable to future residents. The reasons for this are as follows:
- Most developments in urban areas will be subject to noise levels above the ProPG recommended noise levels for balconies<sup>1</sup>;
  - It is common for noise levels on balconies facing main roads to exceed the ProPG recommended noise levels in Ruislip and elsewhere;
  - It is reasonable to assume that residents would prefer the option to have a noisier balcony as opposed to having no balcony at all;
  - There is no evidence we are aware of that high noise levels on balconies present a risk to residents' health and well-being;
  - Planners often consider it to be beneficial to the street-scape to have balconies facing roads as they may help marry the development to the surrounding area.
- 5.38 The current design of the development is therefore considered to be acceptable in relation to noise levels in external amenity areas.

## Stage 2 – Element 5 – Other relevant issues

- 5.39 In our view the design and acoustic approach outlined above is in line with both local and national noise policy. It is common for residential properties to be situated near to main roads and railway lines and this is an acceptable scenario provided that the properties are acoustically upgraded where necessary to achieve acceptable noise levels in habitable areas.

## Recommendation to decision maker

- 5.40 It is our view that planning permission should be granted in relation to noise affecting habitable areas of the development.

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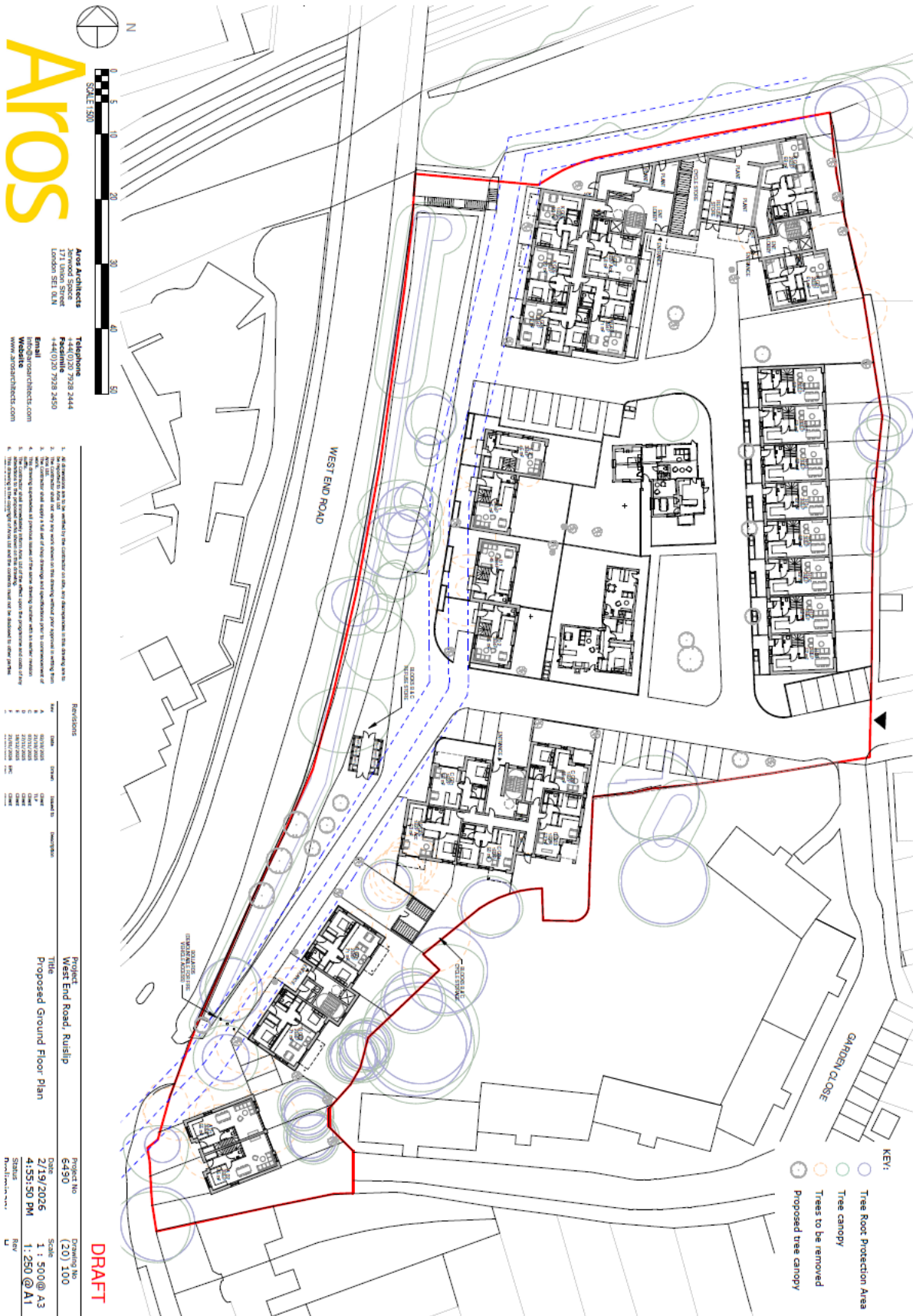
<sup>1</sup> Table 2 from BS8233 notes that daytime noise levels will typically exceed 50-55 dB LAeq,16hr in areas close to busy main roads. It was also found in the UK National Noise Incidence Study 2000/2001 that 90% of UK homes were exposed to daytime noise levels >50dB LAeq,16hr and 54% of UK homes were exposed to noise >55dB LAeq,16hr. It is reasonable to assume that a high percentage of these were in urban areas.

## **6. CONCLUSIONS**

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- 6.1 A noise survey was carried out between 6 and 14 December 2022.
- 6.2 The results of the noise survey were used to calculate noise ingress through the facades of the proposed habitable rooms and glazing and ventilator performance requirements were specified to meet appropriate design criteria.
- 6.3 Appropriate internal noise levels are anticipated to be readily achievable in occupied areas of both the new build and retained buildings of the development.
- 6.4 Advice has been provided in regard to Building Regulations Part O to assist the overheating assessment. Bedrooms facing West End Road and the railway will need to be designed so that windows can remain closed at night without the rooms overheating. This can be assessed further in due course.
- 6.5 It is our view that the site is suitable for the development in terms of noise levels and that planning permission should be granted with respect to noise.

# Appendix 1 Site Layout



## Appendix 2 Survey Results

### Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by road traffic on surrounding roads and noise from train passes on the adjacent railway. Vibration levels at the site were very low.

### Survey Period:

06/12/2022 to 14/12/2022

### Survey Objectives:

- To identify noise sources that contribute to ambient noise levels at the site;
- To measure noise levels around the site over a typical day and night-time period.

### Equipment Used:

Type	Manufacturer	Model	Serial Number
Sound level meter <sup>1</sup>	NTi Audio	XL2	A2A-17487-E0
Calibrator	NTi Audio	600 000 388	15011
Sound level meter <sup>1</sup> (noise logger)	Rion	NL-32	00530374
Calibrator	Rion	NC-74	34551703
Sound level meter <sup>1</sup>	Rion	NL-52	00965090

**Note 1:** All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

### Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring.

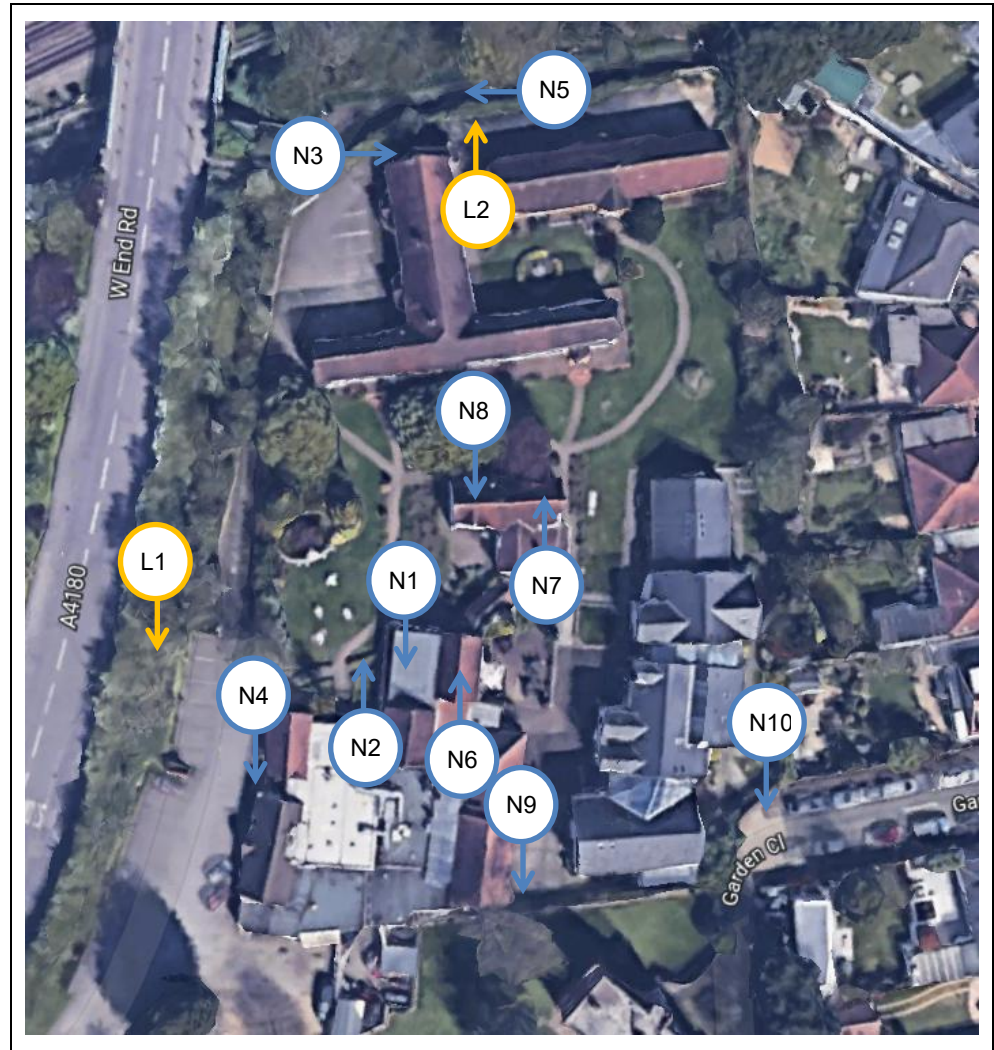
### Measurement Positions:

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above ground. Inside dining room, 1.5m from window facing West, towards West End Road (35m).
N2	Attended noise monitoring position. 1.5m above ground. Free-field. Outside dining room, 1.5m from window facing West, towards West End Road (32m).
N3	Attended noise monitoring position. 1.5m above ground. Free-field. Proposed façade location, 27m from railway.
N4	Attended noise monitoring position. 1.5m above ground. Free-field. Proposed façade location, 21m from West End Road.
N5	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to railway (22m).

**Measurement Positions:**

<b>Position (refer plan below)</b>	<b>Description</b>
N6	Attended noise monitoring position. 1.5m above ground. Inside Tudor Lodge, 1.5m from window facing North, towards railway (84m).
N7	Attended noise monitoring position. 1.5m above ground. Inside ground floor bedroom, 1.5m from window facing East.
N8	Attended noise monitoring position. 1.5m above ground. Inside first floor bedroom, 1.5m from window facing South.
N9	Attended noise monitoring position. 1.5m above ground. Free-field. Proposed façade location, 35m from Garden Close.
N10	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Eversley Crescent (43m).
L1	Unattended noise logging position. 2m above ground level. Free-field. Direct line of sight to West End Road (6m).
L2	Unattended noise logging position. 2m above ground level. Free-field. Direct line of sight to railway (25m).

**Site Plan showing Measurement Positions:**



**Attended Noise Monitoring Results:**

Date	Position	Time	Meas. Length	LAeq, dB	LAmx, dB	LA90, dB	Observations
06/12/2022	N1	12:10	3 mins	39	59	29	Noise dictated by road traffic from West End Road and noise within the hotel.
06/12/2022	N1	12:15	5 mins	37	58	29	Noise dictated by road traffic from West End Road and noise within the hotel.
06/12/2022	N1	12:20	5 mins	41	63	31	Noise dictated by road traffic from West End Road and noise within the hotel.
06/12/2022	N2	12:30	5 mins	52	59	45	Noise dictated by road traffic from West End Road and water feature on hotel premises.
06/12/2022	N3	12:50	5 mins	52	63	46	Noise dictated by railway, road traffic from West End Road and helicopter flyover.
06/12/2022	N4	13:10	5 mins	55	64	44	Noise dictated by road traffic from West End Road.

**Attended Noise Monitoring Results:**

Date	Position	Time	Meas. Length	LAeq, dB	LAmx, dB	LA90, dB	Observations
06/12/2022	N5	13:30	2 mins	55	62	50	Noise dictated by railway and road traffic from West End Road.
06/12/2022	N5	13:35	1 min	56	63	49	Noise dictated by railway and road traffic from West End Road.
06/12/2022	N6	13:50	5 mins	33	54	29	Noise dictated by road traffic from West End Road and aircraft flyover.
06/12/2022	N6	14:00	5 mins	33	55	28	Noise dictated by road traffic from West End Road.
06/12/2022	N7	14:15	5 mins	18	36	28	Noise dictated by road traffic from West End Road.
06/12/2022	N8	14:25	5 mins	28	47	20	Noise dictated by road traffic from West End Road.
06/12/2022	N8	14:45	5 mins	26	42	21	Noise dictated by road traffic from West End Road.
06/12/2022	N7	15:10	5 mins	25	42	19	Noise dictated by road traffic from West End Road and aircraft flyover.
06/12/2022	N9	15:30	5 mins	51	61	46	Noise dictated by road traffic from West End Road and helicopter flyover.
06/12/2022	N10	15:50	5 mins	46	57	40	Noise dictated by road traffic from Eversley Crescent and West End Road, and helicopter flyover.
06/12/2022	N9	16:00	5 mins	50	61	46	Noise dictated by road traffic from West End Road and helicopter flyover.
06/12/2022	N3	16:10	5 mins	52	59	47	Noise dictated by railway, road traffic from West End Road and helicopter flyover.
06/12/2022	N10	16:20	5 mins	50	65	40	Noise dictated by road traffic from Eversley Crescent, Garden Close and West End Road, and helicopter flyover.

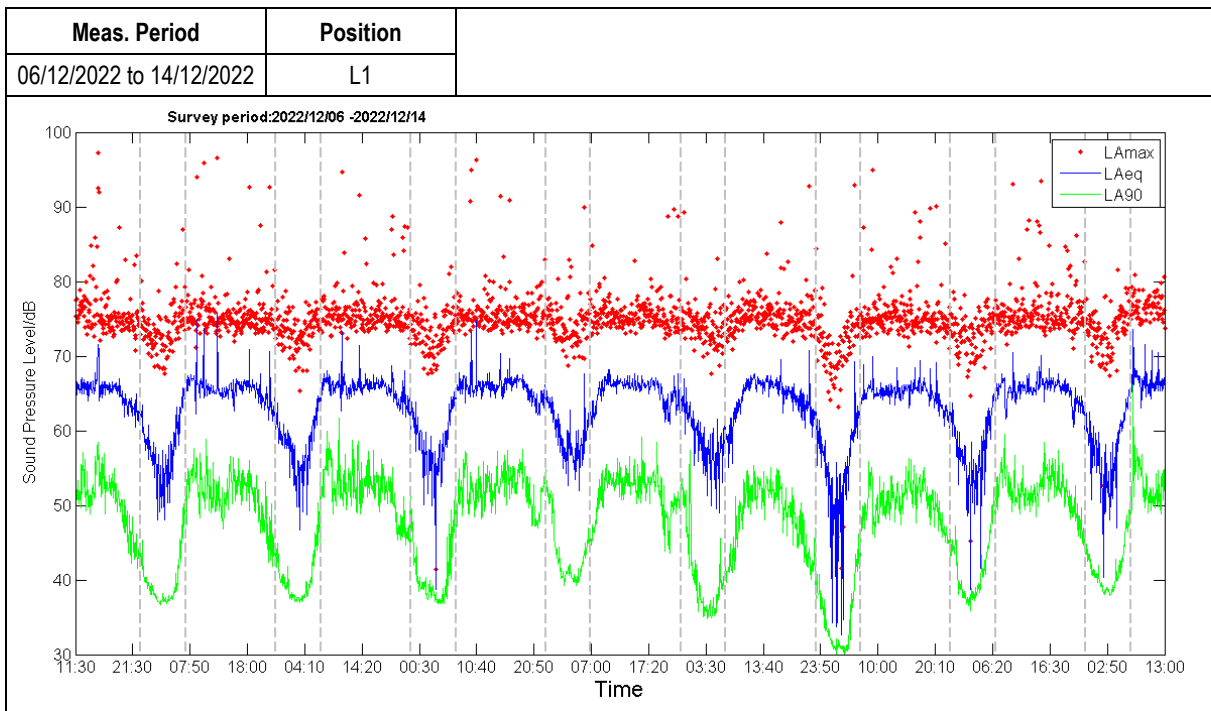
**Unattended Noise Monitoring Results:**

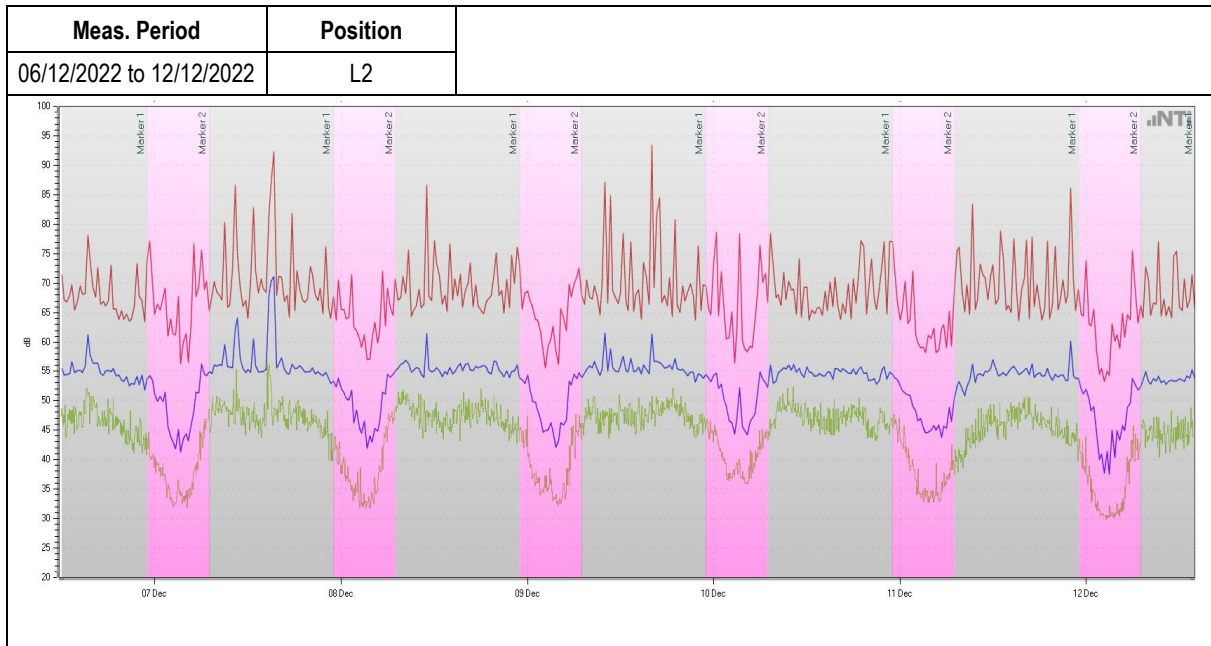
Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB <sup>1</sup>	LAeq,8hr, dB	LA90,5mins, dB <sup>1</sup>	LAm <sub>ax</sub> , dB <sup>2</sup>
06/12/2022 to 14/12/2022	L1	66	52	60	38	77
06/12/2022 to 12/12/2022	L2	57	46	50	34	79

**Note 1:** Typical lowest measured during the period shown.

**Note 2:** Highest typical maximum noise level during the night-time (not exceeded more than 10-15 times per night).

**Unattended Noise Monitoring Results:**





# Appendix 3 Modelling Results

**Modelling Software:**

CADNA/A Version 2026 MR1

**Modelled Scenarios:**

Day and night-time average noise levels across the site  
 Night-time maximum noise levels

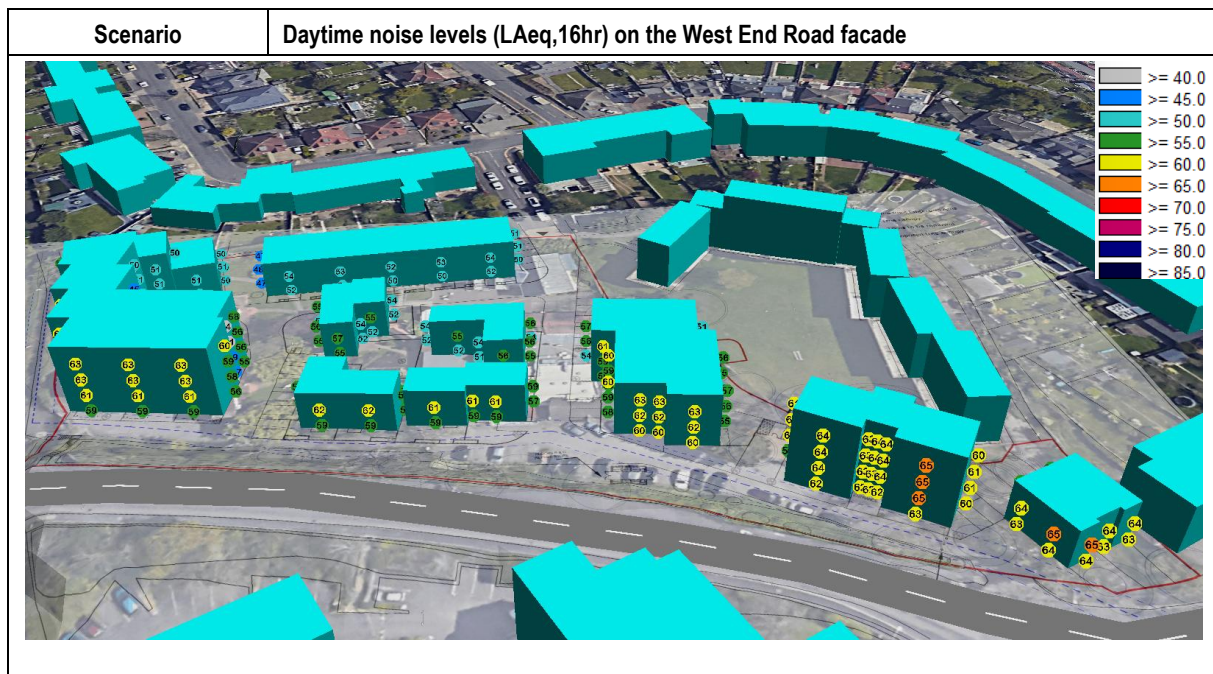
**Data inputs:**

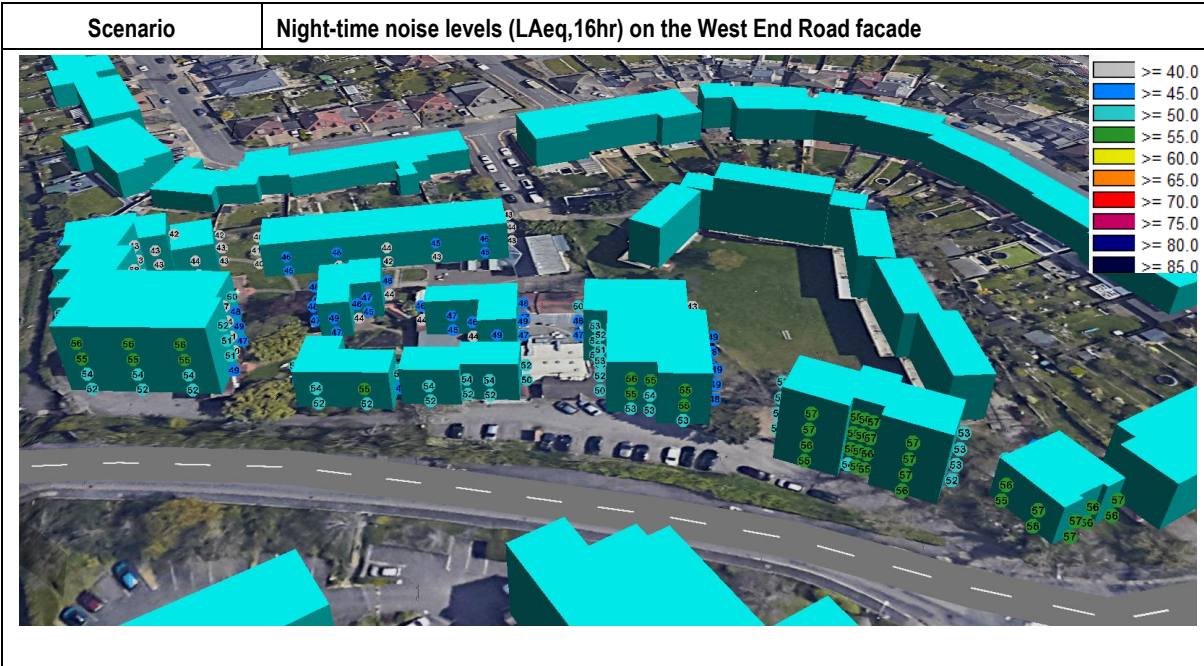
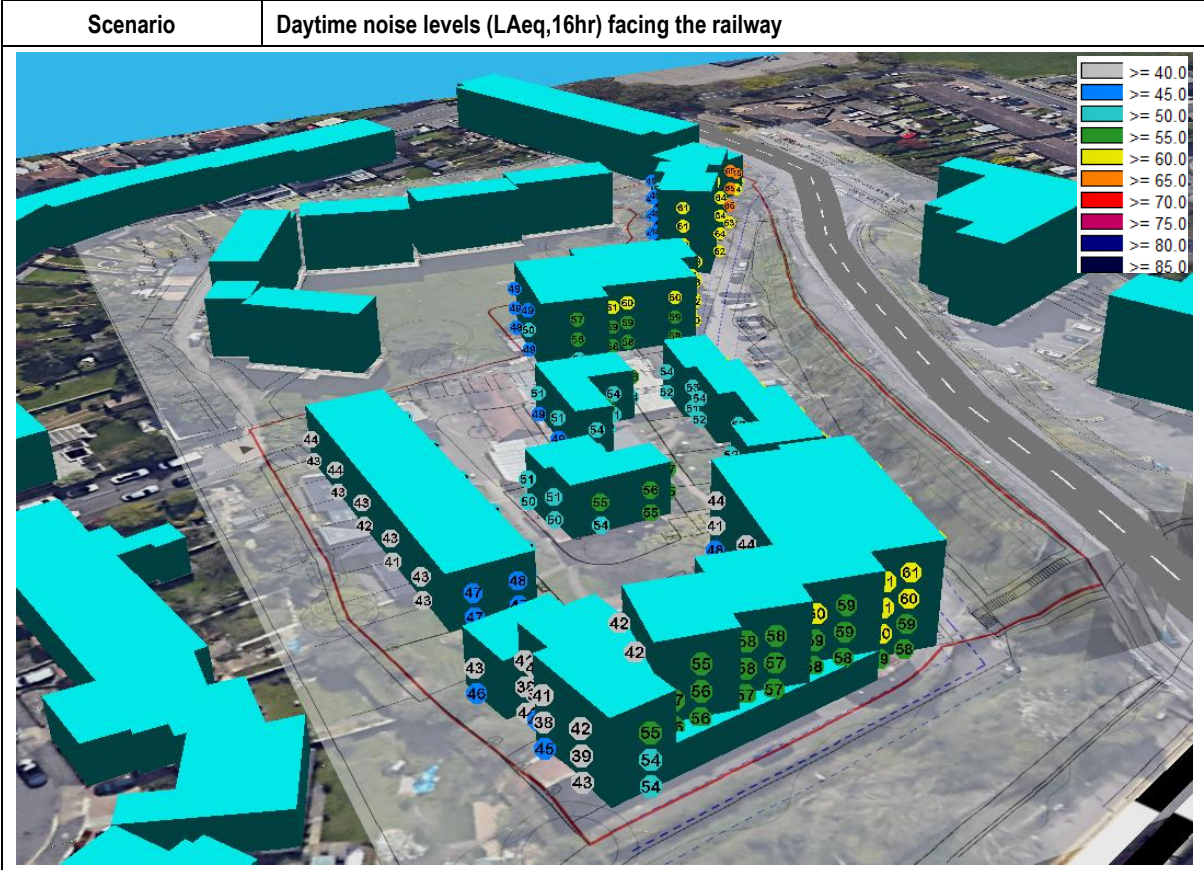
- Noise survey results
- Topographical data for the site
- Development layout

**Calculation Algorithms Used:**

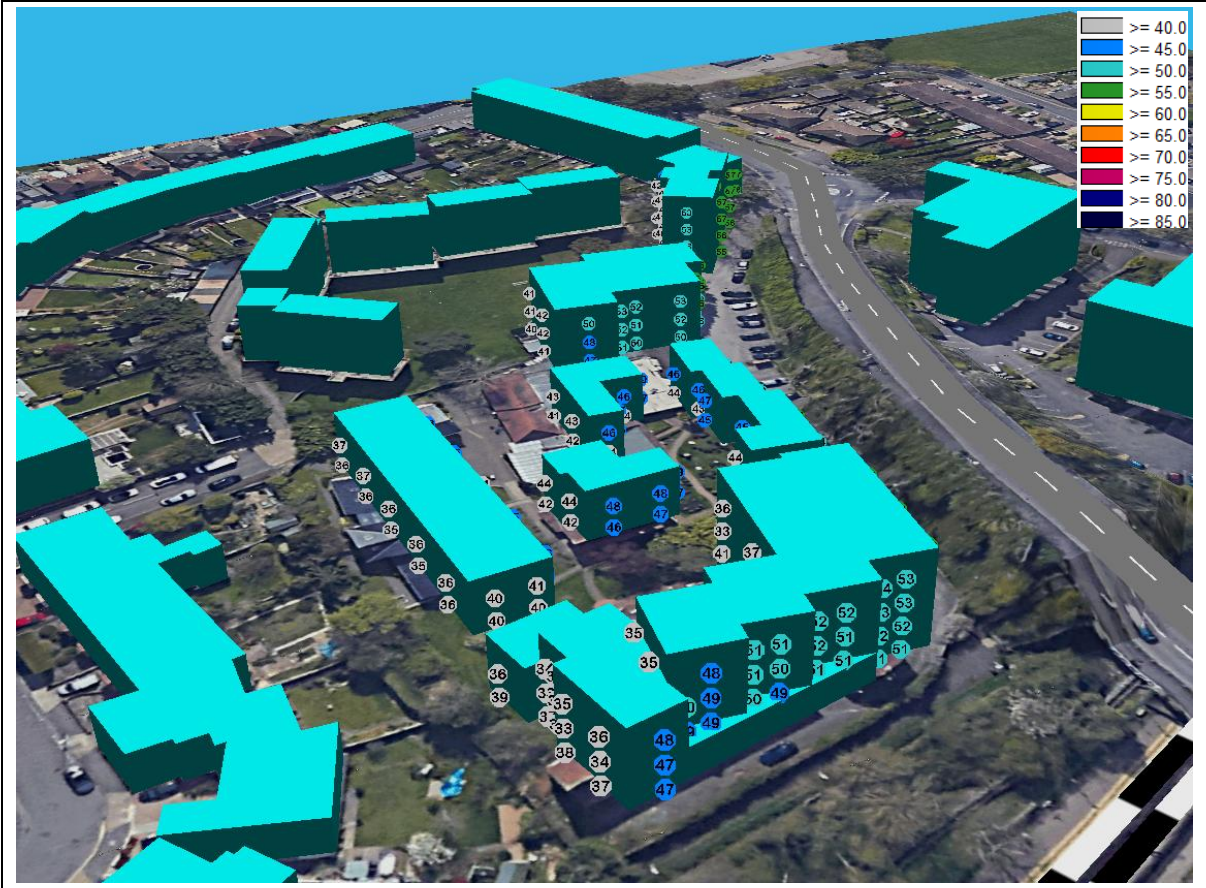
- Calculation of Road Traffic Noise 1988 – Department of Transport
- ISO 9613-1:1993 Acoustics-Attenuation of sound during propagation outdoors – Part 1: Calculation of the absorption of sound by the atmosphere
- ISO 9613-2:2024 Acoustics-Attenuation of sound during propagation outdoors – Part 2: Engineering method for the prediction of sound pressure levels outdoors

**Modelling Printout:**

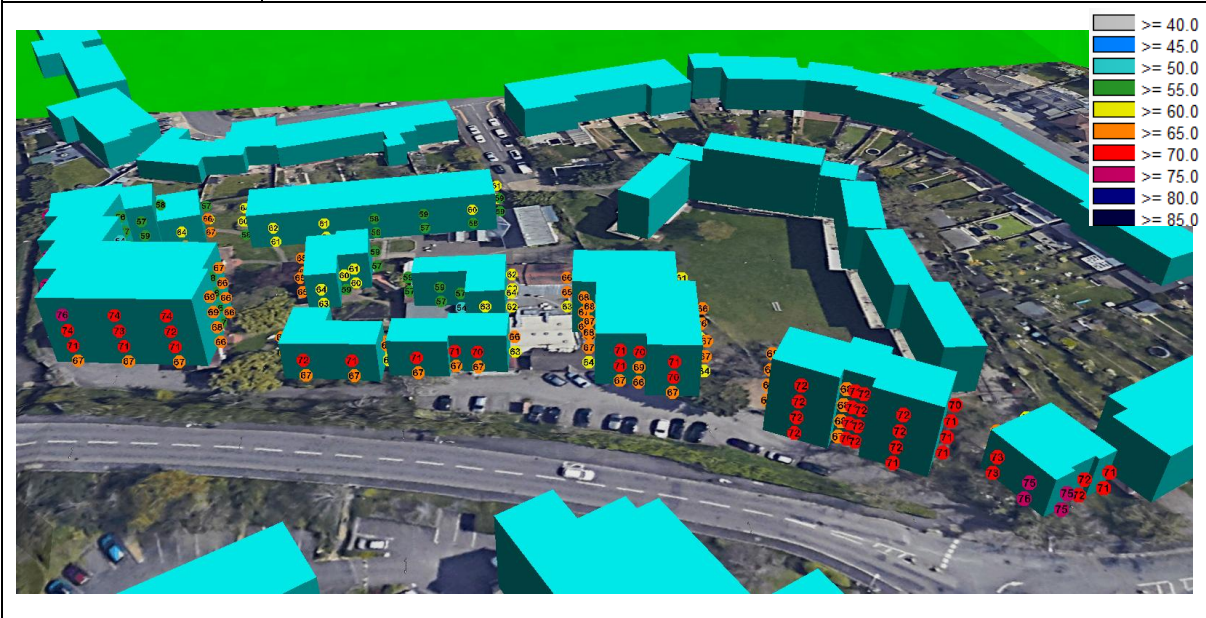




Scenario Night-time noise levels (LAeq,16hr) facing the railway



Scenario Night-time Maximum noise levels (LAmx) on the West End Road facade



Scenario

Night-time noise levels (L<sub>Amax</sub>) facing the railway



## Appendix 4 Facade Noise Ingress Calculations

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PROJECT: The Barn Hotel  
 ROOM: Block A - Bedroom  
 VARIANT: Worst-Case Daytime Average Noise Level (LAeq)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] **3.3** X **4.2** X **2.4**  
 Room Volume = **33.1** m<sup>3</sup>  
 Partition Area = **16.5** m<sup>2</sup>  
 Ventilation ref area = **10.0** m<sup>2</sup>  
 Free Field SPL K = **3** dB

SELECT Free Field or Façade SPL for model input >>>

NOTES: \_\_\_\_\_

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	65.0							
	46.8	50.9	54.4	57.8	61.0	58.2	53.0	Reference spectrum

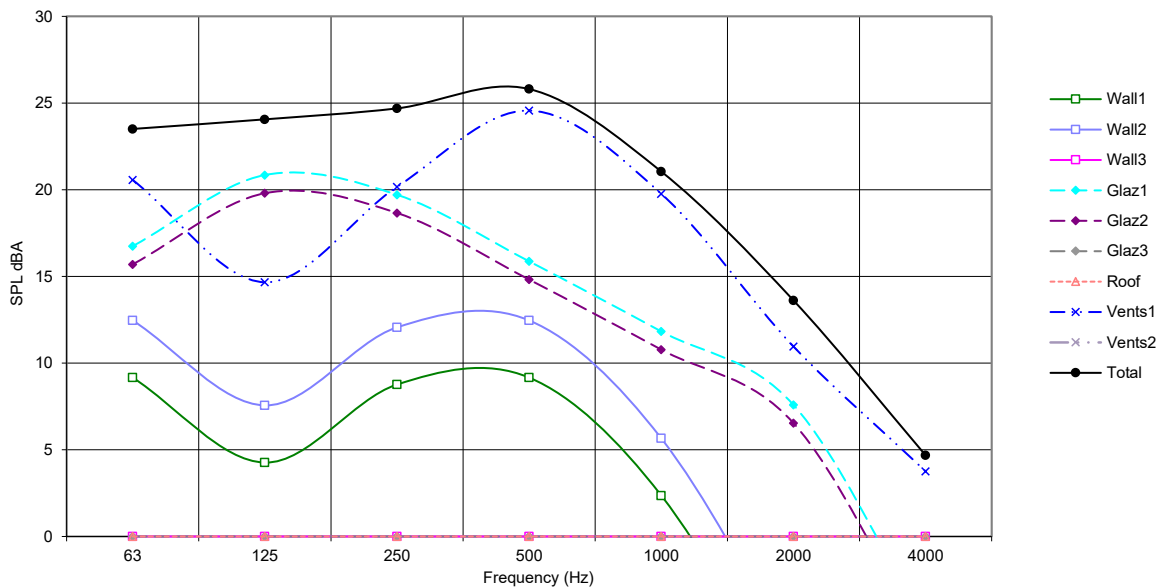
**REVERBERATION TIME**

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m <sup>2</sup> ]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	3.6	36	45	44	47	57	67	77	2%	54	0	-4
ATTENUATION												
Wall 2 Typical - 102mm brick/50mm cavity/100mm block	7.8	36	45	44	47	57	67	77	5%	54	0	-4
ATTENUATION												
Wall 3 WALLS	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.8	27	27	32	39	46	48	55	25%	37 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.2	27	27	32	39	46	48	55	19%	37 (inc Ctr)	-	-
ATTENUATION												
Glazing 3 GLAZING	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		31	32	37	43	51	53	60				
Resultant SPL inside room excluding ventilators dB		28.2	20	24	23	20	15	10	-3	51%		

Ventilator Type	Num	D <sub>ne</sub> dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Greenwood 2500EAW.AC2 (Vent + 2 Acoustic Modules - External & Internals)	2	32	42	40	39	47	53	55	49%	45	-2	-3
ATTENUATION												
Ventilation VENTS	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		28.1	21	15	20	25	20	11	4	49%		
<b>Total SPL inside room</b>		<b>31.2</b>	<b>24</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>21</b>	<b>14</b>	<b>5</b>			

**Element contribution to total internal noise level**



PROJECT: The Barn Hotel  
 ROOM: Block A - Bedroom  
 VARIANT: Worst-Case Night-time Average Noise Level (LAeq)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] **3.3** X **4.2** X **2.4**  
 Room Volume = 33.1 m<sup>3</sup>  
 Partition Area = 16.5 m<sup>2</sup>  
 Ventilation ref area = 10.0 m<sup>2</sup>  
 Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

NOTES: \_\_\_\_\_

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	57.0							
	38.8	42.9	46.4	49.8	53.0	50.2	45.0	Reference spectrum

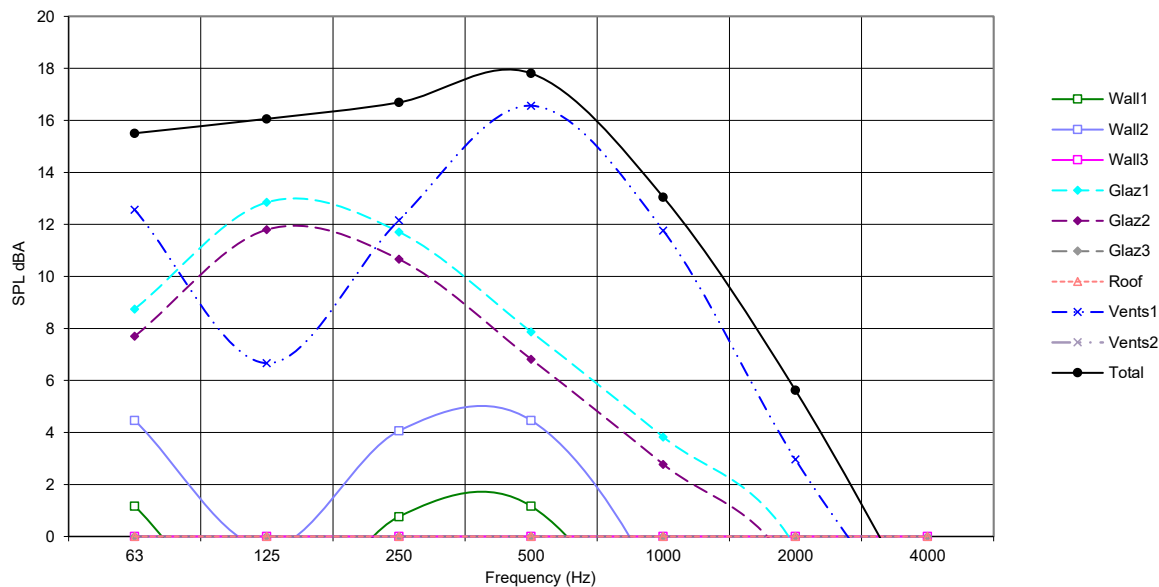
**REVERBERATION TIME**

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m <sup>2</sup> ]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	3.6	36	45	44	47	57	67	77	0%	54	0	-4
ATTENUATION												
Wall 2 Typical - 102mm brick/50mm cavity/100mm block	7.8	36	45	44	47	57	67	77	5%	54	0	-4
ATTENUATION												
Wall 3 WALLS	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.8	27	27	32	39	46	48	55	25%	37 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 37 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.2	27	27	32	39	46	48	55	19%	37 (inc Ctr)	-	-
ATTENUATION												
Glazing 3 GLAZING	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		31	32	37	43	51	53	60				
Resultant SPL inside room excluding ventilators dB	20.2	12	16	15	12	7	2	-11	51%			

Ventilator Type	Num	D <sub>n,e</sub> dB to BS EN 20140-10:1992								D <sub>nw</sub>	C	Ctr
Ventilation Greenwood 2500EAW.AC2 (Vent + 2 Acoustic Modules - External & Int)	2	32	42	40	39	47	53	55	49%	45	-2	-3
ATTENUATION												
Ventilation VENTS	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	20.1	13	7	12	17	12	3	-4	49%			
<b>Total SPL inside room</b>	<b>23.2</b>	<b>16</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>13</b>	<b>6</b>	<b>-3</b>				

**Element contribution to total internal noise level**





PROJECT: The Barn Hotel  
 ROOM: Block A - Living Room  
 VARIANT: Worst-Case Daytime Average Noise Level (LAeq)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m]  $W = 6.1 \times L = 4.5 \times H = 2.4$   
 Room Volume = 65.6 m<sup>3</sup>  
 Partition Area = 25.4 m<sup>2</sup>  
 Ventilation ref area = 10.0 m<sup>2</sup>  
 Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>

NOTES:

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	64.0							
	45.8	49.9	53.4	56.8	60.0	57.2	52.0	Reference spectrum

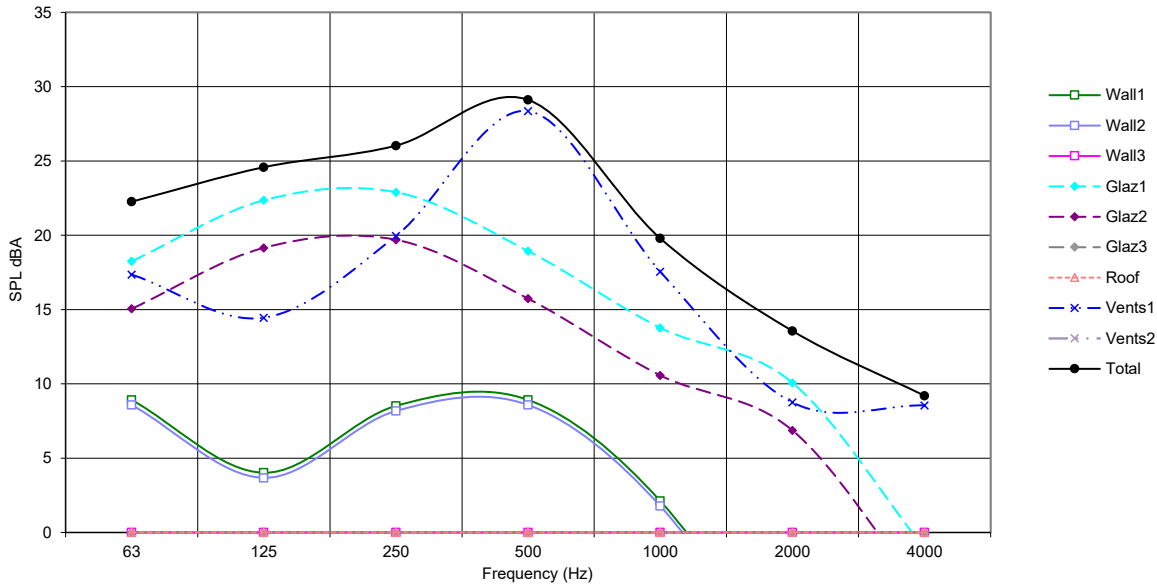
**REVERBERATION TIME**

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m <sup>2</sup> ]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.6	36	45	44	47	57	67	77	1%	54	0	-4
ATTENUATION												
Wall 2 Typical - 102mm brick/50mm cavity/100mm block	7.9	36	45	44	47	57	67	77	1%	54	0	-4
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 34 dB Rw + Ctr - High Acoustic Performance Double Glazing	6.0	25	25	28	35	44	45	51	30%	34 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 34 dB Rw + Ctr - High Acoustic Performance Double Glazing	2.9	25	25	28	35	44	45	51	15%	34 (inc Ctr)	-	-
ATTENUATION												
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		29	30	32	39	48	49	55				
Resultant SPL inside room excluding ventilators dB		29.3	21	24	25	21	16	12	1	48%		

Ventilator Type	Num	D <sub>n,e</sub> dB to BS EN 20140-10:1992								D <sub>nw</sub>	C	Ctr
Ventilation Greenwood 5000EAW.AC2 (Vent + 2 Acoustic Modules - External & Int)	3	33	40	38	33	47	53	48	52%	42	-2	-4
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		29.7	17	14	20	28	18	9	9	52%		
<b>Total SPL inside room</b>		<b>32.5</b>	<b>22</b>	<b>25</b>	<b>26</b>	<b>29</b>	<b>20</b>	<b>14</b>	<b>9</b>			

Element contribution to total internal noise level



PROJECT: The Barn Hotel  
 ROOM: Block G - Bedroom  
 VARIANT: Worst-Case Daytime Average Noise Level (LAeq)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] **3.1** X **3.5** X **2.4**  
 Room Volume = **26.0** m3  
 Partition Area = **15.8** m2  
 Ventilation ref area = **10.0** m2  
 Free Field SPL K = **3** dB

SELECT Free Field or Façade SPL for model input >>>

NOTES: \_\_\_\_\_

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	63.0							
	44.8	48.9	52.4	55.8	59.0	56.2	51.0	Reference spectrum

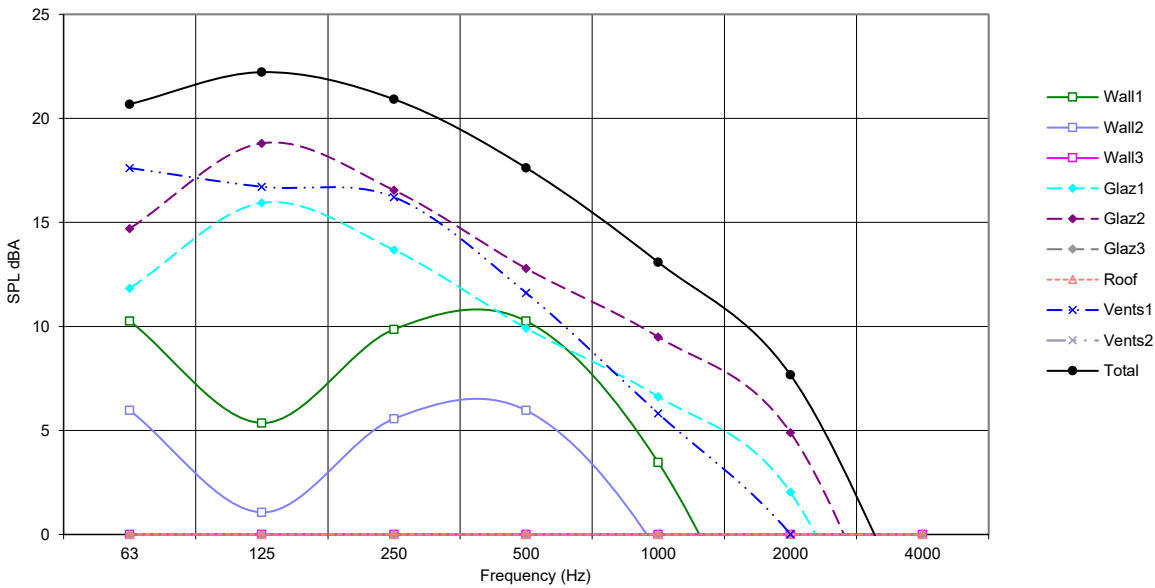
**REVERBERATION TIME**

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m2]	SRI dB to BS EN ISO 140-3:1995							Rw	C	Ctr	
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	5.8	36	45	44	47	57	67	77	7%	54	0	-4
ATTENUATION												
Wall 2 Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	3%	54	0	-4
ATTENUATION		2	2	2	2	2	2	2				
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	19%	39 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	37%	39 (inc Ctr)	-	-
ATTENUATION		2	2	2	2	2	2	2				
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		33	34	39	45	53	55	64				
Resultant SPL inside room excluding ventilators dB	25.1	18	21	19	16	12	7	-7	66%			

Ventilator Type	Num	D <sub>n,e</sub> dB to BS EN 20140-10:1992							D <sub>nw</sub>	C	Ctr	
Ventilation Brookvent TunalSus 290-10	2	34	39	43	51	60	63	67	34%	50	-1	-5
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	22.2	18	17	16	12	6	0	-9	34%			
<b>Total SPL inside room</b>	<b>26.9</b>	<b>21</b>	<b>22</b>	<b>21</b>	<b>18</b>	<b>13</b>	<b>8</b>	<b>-5</b>				

**Element contribution to total internal noise level**



PROJECT: The Barn Hotel  
 ROOM: Block G - Bedroom  
 VARIANT: Worst-Case Night-time Average Noise Level (LAeq)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] **W** 3.1 X **L** 3.5 X **H** 2.4

Room Volume = 26.0 m<sup>3</sup>  
 Partition Area = 15.8 m<sup>2</sup>  
 Ventilation ref area = 10.0 m<sup>2</sup>  
 Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>  Free Field  Façade

NOTES: \_\_\_\_\_

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-	-	-	-	-	-	-	No data
Road traffic spectrum (according to BS 8233:1999 section 6)	56.0							
	37.8	41.9	45.4	48.8	52.0	49.2	44.0	Reference spectrum

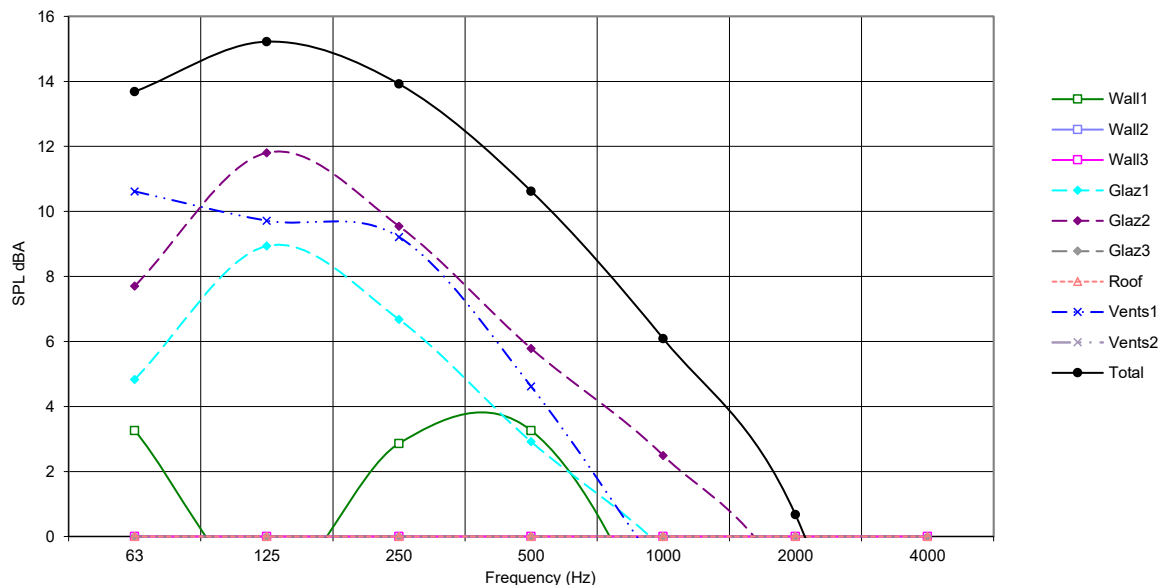
**REVERBERATION TIME**

DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m <sup>2</sup> ]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	5.8	36	45	44	47	57	67	77	7%	54	0	-4
ATTENUATION												
Wall 2 Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	1%	54	0	-4
ATTENUATION		2	2	2	2	2	2	2				
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	19%	39 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	36%	39 (inc Ctr)	-	-
ATTENUATION		2	2	2	2	2	2	2				
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		33	34	39	45	53	55	64				
Resultant SPL inside room excluding ventilators dB		18.1	11	14	12	9	5	0	-14	66%		

Ventilator Type	Num	D <sub>n,e</sub> dB to BS EN 20140-10:1992								D <sub>nw</sub>	C	Ctr
Ventilation Brookvent TunalSus 290-10	2	34	39	43	51	60	63	67	33%	50	-1	-5
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		15.2	11	10	9	5	-1	-7	-16	34%		
<b>Total SPL inside room</b>		<b>19.9</b>	<b>14</b>	<b>15</b>	<b>14</b>	<b>11</b>	<b>6</b>	<b>1</b>	<b>-12</b>			

**Element contribution to total internal noise level**



PROJECT: The Barn Hotel  
 ROOM: Block G - Bedroom  
 VARIANT: Worst-Case Night-time Maximum Noise Level (L<sub>Am</sub>)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no ventilators.

Room Dimensions [m] **W** 3.1 X **L** 3.5 X **H** 2.4

Room Volume = 26.0 m<sup>3</sup>  
 Partition Area = 15.8 m<sup>2</sup>  
 Ventilation ref area = 10.0 m<sup>2</sup>  
 Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>  Free Field  Façade

NOTES: \_\_\_\_\_

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000
Direct input - Free Field SPL (A weighted octave bands) dB ----->	76.0	64.7	64.7	63.1	67.5	72.6	68.0
Road traffic spectrum (according to BS 8233:1999 section 6)							
	64.7	64.7	63.1	67.5	72.6	68.0	62.1

**REVERBERATION TIME**

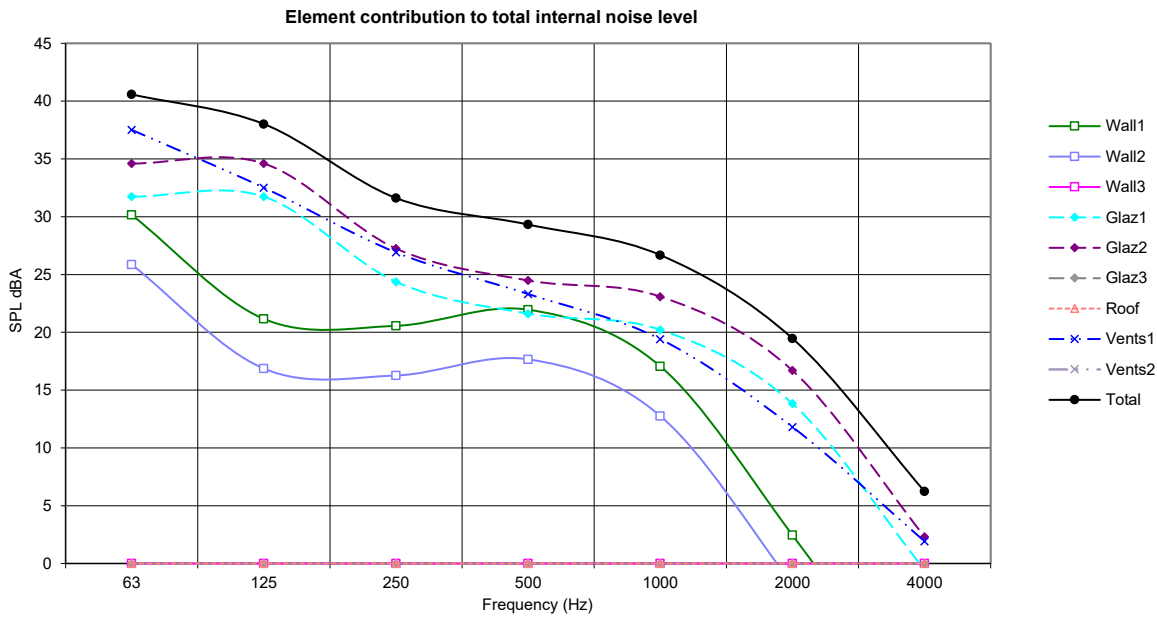
DIRECT INPUT ----->  No data

EQUAL RT for all bands ----->  Default - RT set to 0.5s

0.5	0.5	0.5	0.5	0.5	0.5	0.5
-----	-----	-----	-----	-----	-----	-----

Façade Element	Area [m <sup>2</sup> ]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	5.8	36	45	44	47	57	67	77	7%	54	0	-4
ATTENUATION												
Wall 2 Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	3%	54	0	-4
ATTENUATION		2	2	2	2	2	2	2				
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	17%	39 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	33%	39 (inc Ctr)	-	-
ATTENUATION		2	2	2	2	2	2	2				
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		33	34	39	45	53	55	64				
Resultant SPL inside room excluding ventilators dB		40.9	38	37	30	28	26	19	4	60%		

Ventilator Type	Num	D <sub>n,e</sub> dB to BS EN 20140-10:1992								D <sub>nw</sub>	C	Ctr
Ventilation VENTS	2	34	39	43	51	60	63	67	40%	50	-1	-5
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		39.2	38	33	27	23	19	12	2	40%		
Total SPL inside room		43.2	41	38	32	29	27	19	6			



PROJECT: The Barn Hotel  
 ROOM: Block G - Bedroom  
 VARIANT: Worst-Case Night-time Maximum Noise Level (L<sub>Amax</sub>)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m]  $\begin{matrix} W \\ 3.1 \end{matrix}$  X  $\begin{matrix} L \\ 3.5 \end{matrix}$  X  $\begin{matrix} H \\ 2.4 \end{matrix}$   
 Room Volume = 26.0 m<sup>3</sup>  
 Partition Area = 15.8 m<sup>2</sup>  
 Ventilation ref area = 10.0 m<sup>2</sup>  
 Free Field SPL K = 3 dB

SELECT Free Field or Façade SPL for model input >>>  Free Field  Façade

NOTES: \_\_\_\_\_

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000
Direct input - Free Field SPL (A weighted octave bands) dB ----->	79.0	52.8	61.0	74.5	74.1	71.1	69.3
Road traffic spectrum (according to BS 8233:1999 section 6)							
	52.8	61.0	74.5	74.1	71.1	69.3	63.9

Direct input

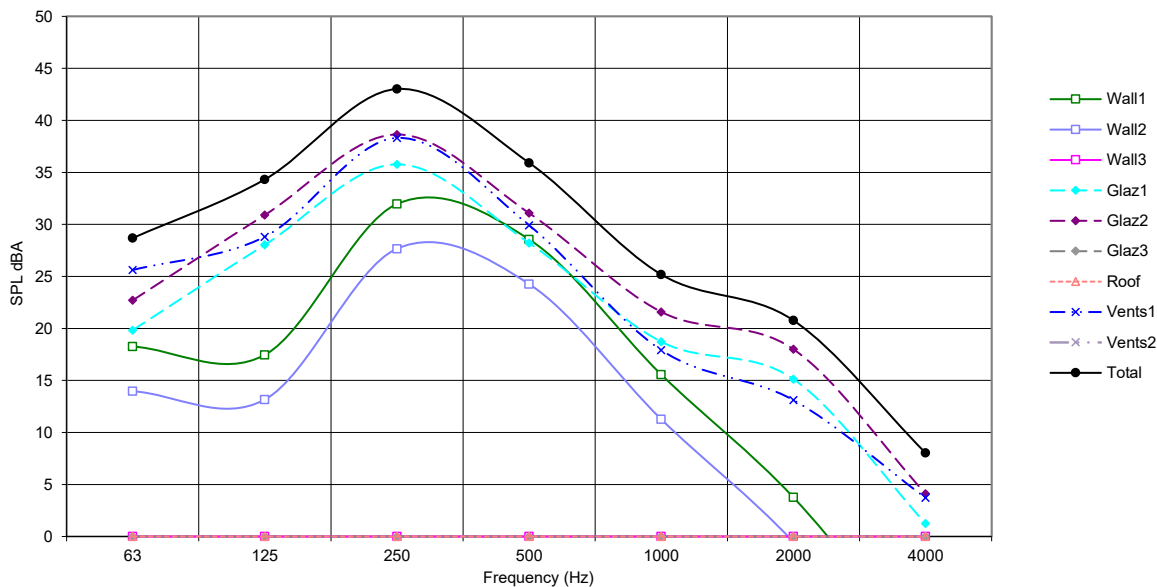
**REVERBERATION TIME**

DIRECT INPUT ----->  No data  
 EQUAL RT for all bands ----->  Default - RT set to 0.5s

Façade Element	Area [m <sup>2</sup> ]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	5.8	36	45	44	47	57	67	77	9%	54	0	-4
ATTENUATION												
Wall 2 Typical - 102mm brick/50mm cavity/100mm block	3.4	36	45	44	47	57	67	77	3%	54	0	-4
ATTENUATION		2	2	2	2	2	2	2				
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 39 dB Rw + Ctr - Very High Performance Double Glazing	1.6	29	29	35	42	48	50	59	19%	39 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 39 dB Rw + Ctr - Very High Performance Double Glazing	4.9	29	29	35	42	48	50	59	37%	39 (inc Ctr)	-	-
ATTENUATION		2	2	2	2	2	2	2				
Glazing 3 GLAZING		0	0	0	0	0	0	0	0%			
ATTENUATION												
Roof ROOF / FLOOR		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant composite Façade SRI		33	34	39	45	53	55	64				
Resultant SPL inside room excluding ventilators dB		42.8	26	33	41	35	24	20	6	68%		

Ventilator Type	Num	D <sub>n,e</sub> dB to BS EN 20140-10:1992								D <sub>nw</sub>	C	Ctr
Ventilation Brookvent TunalSus 290-10	2	34	39	43	51	60	63	67	32%	50	-1	-5
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		39.5	26	29	38	30	18	13	4	32%		
<b>Total SPL inside room</b>		<b>44.4</b>	<b>29</b>	<b>34</b>	<b>43</b>	<b>36</b>	<b>25</b>	<b>21</b>	<b>8</b>			

**Element contribution to total internal noise level**



PROJECT: The Barn Hotel  
 ROOM: Block G - Living Room  
 VARIANT: Worst-Case Daytime Average Noise Level (LAeq)  
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] **4.8** X **6.1** X **2.4**  
 Room Volume = **69.7** m3  
 Partition Area = **26.1** m2  
 Ventilation ref area = **10.0** m2  
 Free Field SPL K = **3** dB

SELECT Free Field or Façade SPL for model input >>>

NOTES:

**EXTERNAL SPECTRUM (A weighted)**

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	63.0							
	44.8	48.9	52.4	55.8	59.0	56.2	51.0	Reference spectrum

**REVERBERATION TIME**

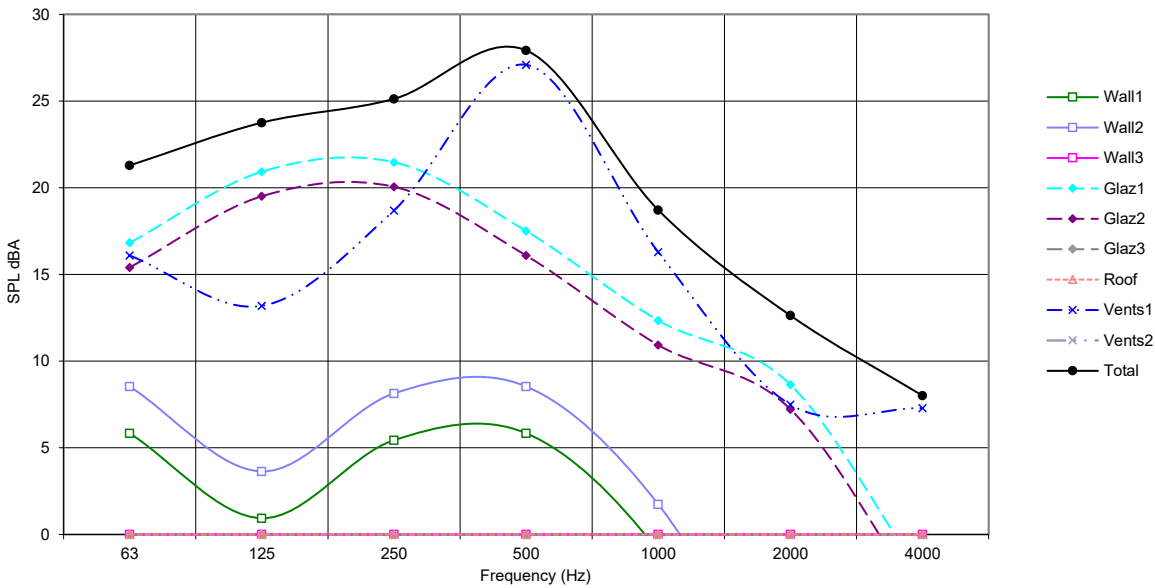
DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block ATTENUATION	5.7	36	45	44	47	57	67	77	1%	54	0	-4
Wall 2 Typical - 102mm brick/50mm cavity/100mm block ATTENUATION	10.5	36	45	44	47	57	67	77	2%	54	0	-4
Wall 3 WALLS ATTENUATION		0	0	0	0	0	0	0	0%			
Glazing 1 34 dB Rw + Ctr - High Acoustic Performance Double Glazing ATTENUATION	5.8	25	25	28	35	44	45	51	28%	34 (inc Ctr)	-	-
Glazing 2 34 dB Rw + Ctr - High Acoustic Performance Double Glazing ATTENUATION	4.2	25	25	28	35	44	45	51	20%	34 (inc Ctr)	-	-
Glazing 3 GLAZING ATTENUATION		0	0	0	0	0	0	0	0%			
Roof ROOF / FLOOR ATTENUATION		0	0	0	0	0	0	0	0%			
Resultant composite Façade SRI		29	29	32	39	48	49	55				
Resultant SPL inside room excluding ventilators dB		28.5	20	23	24	20	15	11	0	51%		

Ventilator Type	Num	D <sub>ne</sub> dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Greenwood 5000EAW.AC2 (Vent + 2 Acoustic Modules - External & Int ATTENUATION	3	33	40	38	33	47	53	48	49%	42	-2	-4
Ventilation VENTS ATTENUATION		0	0	0	0	0	0	0	0%			
Resultant SPL inside room through ventilators dB		28.5	16	13	19	27	16	7	7	49%		

**Total SPL inside room** 31.5 21 24 25 28 19 13 8

**Element contribution to total internal noise level**



## Appendix 5 Part O Acoustic Requirements for Bedrooms at Night



Ref.	Colour	Outside-to-inside noise reduction requirement	Part O Requirement for Bedrooms
ADO01	Green	4 dB	Energy assessment (e.g. TM59) to show that bedrooms will not overheat at night with windows fully open (e.g. 13% of floor area, which is typically around 1.3m <sup>2</sup> ) and ventilators fully open.
ADO02	Yellow	9 dB	Energy assessment (e.g. TM59) to show that bedrooms will not overheat at night with windows open (e.g. 4% of floor area, which is typically around 0.4m <sup>2</sup> ) and ventilators fully open.
ADO03	Orange	13 dB	Energy assessment (e.g. TM59) to show that bedrooms will not overheat at night with windows partially open (e.g. ~2% of floor area, which is typically around 0.2m <sup>2</sup> ) and ventilators fully open.
ADO04	Red	>13 dB	Energy assessment (e.g. TM59) to show that bedrooms on these facades will not overheat at night with windows fully closed and ventilators fully open.

**Note 1** ADO requirements only apply to bedrooms during night-time hours (23:00-07:00)

**Note 2** The window open area is specified above as an actual open area, not 'equivalent open area' and the values may therefore need to be converted as part of the overheating assessment.



**Architectural & Environmental Consultants**  
**Acoustics | Air Quality | Overheating**

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