



Architectural & Environmental Consultants
Acoustics | Vibration | Air Quality

Noise Risk Assessment

Capella House, Worthing

Noise Risk Assessment

Project: CAPELLA HOUSE, WORTHING

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1. EXECUTIVE SUMMARY

- 1.1 Cass Allen has been instructed by Architectus Ltd to assess noise and vibration affecting a proposed new development at Capella House, Worthing.
- 1.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 1.3 A noise and vibration survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from Broad Water Road and train passes on the Southern Railway. There is occasional noise from HGVs accessing the nearby supermarket.
- 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 Compliance with noise criteria in Building Regulations Part O has also been assessed. Bedrooms 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 Ground-borne vibration levels at the site have been measured and are negligible.
- 1.7 Appropriate limits for noise emissions from any mechanical plant associated with the proposed development have been identified.
- 1.8 In summary, it is our view that the site is suitable for the development in terms of noise and vibration levels and that planning permission may be granted subject to the imposition of suitable planning conditions.

2. INTRODUCTION

- 2.1 Cass Allen has been instructed by Architectus Ltd to assess noise and vibration affecting a proposed new development at Capella House, Worthing.
- 2.2 The assessment has been carried out in accordance with relevant local and national planning guidance.
- 2.3 The aims of the assessment were:
- to establish the suitability of existing noise and vibration 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 and vibration levels in habitable areas
 - to provide preliminary guidance on noise emissions from proposed mechanical plant.
- 2.4 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION

- 3.1 The site currently contains a car park and is located in a mixed-use area, bounded to the north by the Southern Railway, the east by a Morrisons supermarket delivery yard and to the south by Railway Approach. To the north of the site (beyond the railway) is a vehicle repair shop. To the east is Broad Water Road and to the south of the site is land currently subject to Planning Application: AWDM/0325/19 (awaiting decision) and Teville Road. To the west of the site is Worthing Railway Station.
- 3.2 The site location and surrounding area are shown in Figure 1 below.

Figure 1 Site Location and Surrounding Area



- 3.3 The proposal is to develop the site into a residential block of 35 units over 6 floors. A current drawing of the proposed development layout is shown in Appendix 1

4. PLANNING POLICY

National Policy

- 4.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF) (December 2024). 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 Worthing Borough Council's *Local Plan 2020- 2036 (March 2023)* provides outline guidance on the assessment of noise and vibration affecting new development in the borough.

SP3 HEALTHY COMMUNITIES

a) New development must be designed to achieve healthy, inclusive and safe places, which enable and support healthy lifestyles and address health and well-being needs in Worthing. In order to maximise opportunities to promote healthy lifestyles, where appropriate, new development must:

v. improve environmental sustainability resilience and reduce contributors to poor health and mitigating their risks, such as those associated with climate change,..., noise,... to reduce inequalities and address climate justice;

DM22 - POLLUTION

a) Development should not contribute to, be put at risk from, or be adversely affected by unacceptable levels of soil, ... noise pollution or land instability. Where possible development should help to improve local environmental conditions.

d) Where appropriate, air quality and/or noise assessments and lighting assessments will be required to support planning applications. These should be undertaken in accordance with the most up to date guidance and have regard to any relevant action plans. Any new development in the Worthing Air Quality Management Area must be consistent with the Air Quality Action Plan. Where any identified harm to any of these factors cannot be adequately mitigated, planning permission will be refused.

4.3 To address the requirements of the national and local policies, the following key acoustic matters have been assessed:

- noise affecting the habitable areas of the proposed development
- ground-borne vibration affecting the habitable areas of the proposed development
- noise emissions from the proposed development.

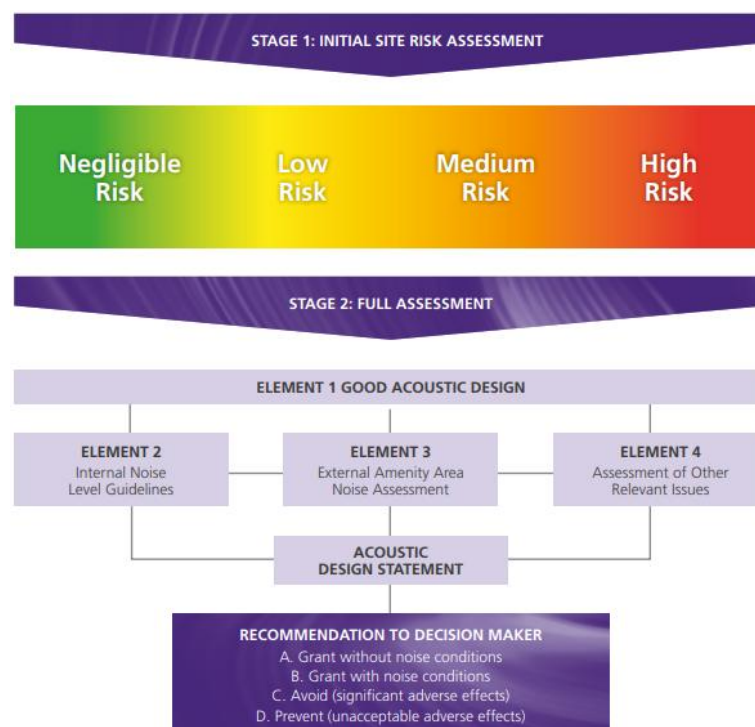
5. NOISE AFFECTING THE DEVELOPMENT

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. 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 assessment, provide a recommendation to the decision maker on whether planning permission can and should be granted.

5.2 The process is shown visually 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. This is discussed further below in relation to noise from vehicles entering the Morrisons delivery yard.

Stage 1 – Noise survey and initial assessment

- 5.4 A noise survey was carried out at the site from 14 to 21 July 2025 to investigate existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2. A further survey was carried out on 13 March 2026 following works to the Morrisons gate which was temporarily creating additional noise during the original survey. A combination of noise data from both surveys has been used in the assessment to represent the noise environment that would exist affecting the development.
- 5.5 Average noise levels (LAeq) across the site were generally dictated by trains on Southern Railway and road traffic on Broad Water Road. Average noise levels at the southern edges of the site were also affected by sporadic vehicle movements on Railway Approach and HGV vehicles entering the Morrisons delivery yard.
- 5.6 Maximum noise levels (LAmax) at the north of the site were largely dictated by trains on the Southern Railway. Maximum noise levels at the south edges of the site were generally dictated by train passes and vehicles approaching and entering the Morrisons delivery yard.
- 5.7 Background noise levels (LA90) across the site were dictated by constant road traffic noise from Broad Water Road and plant running in the Morrisons delivery yard.
- 5.8 No noise from the vehicle repair shop or any other commercial sites was audible during the site visits or identifiable in the recorded survey data.
- 5.9 Noise associated with the Morrisons Delivery yard is limited to HGVs and vans approaching the yard on the public road, opening and closing the gate (assessed based on the updated noise survey), and driving onto the Morrisons site to the loading bay. No other noise (e.g. loading/unloading, reversing alarms etc) was audible from the Morrisons yard.
- 5.10 Analysis of the survey data indicates that these deliveries take place only around 4 or 5 times during the night and do not significantly contribute to the night-time average or assessed maximum noise levels. Noise was also identified coming from a refrigeration unit running on close to the eastern boundary of the site (i.e. at the western boundary of the Morrisons site). Noise emissions from this unit have been measured and accounted for in this assessment.
- 5.11 Noise was identified from the nearby construction site. However, this is a temporary noise source and therefore does not require assessment for planning or mitigation in the development and is not considered further.

5.12 Areas of the development at the northern edge 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:

- Average noise levels during the daytime - 64 dB LAeq,0700-2300hrs
- Average noise levels during the night-time - 61 dB LAeq,2300-0700hrs
- Typical maximum noise levels during the night-time - 85 dB L_{Amax}

5.13 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)



5.14 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 '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

5.15 The acoustic design of the development has been reviewed in relation to the measured noise levels at the site. The layout of the development is considered to represent good acoustic design for the following reasons:

- the layout positions sensitive areas of the residential properties away from the noise sources such as having no habitable rooms or windows facing the railway and minimal facing the Morrisons delivery yard, including no windows to habitable rooms directly overlooking the refrigeration unit.
- Balconies are positioned behind dwellings so that they will be acoustically screened from the noise sources.
- Internal layouts have been designed so that similar types of rooms have been positioned above and below each other in order to avoid any noise disturbance between floors.

Stage 2 – Element 2 - Internal noise levels

- 5.16 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in ProPG. Relevant ProPG design criteria are summarised in Table 1 below.

Table 1 ProPG 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 LAFmax ¹

Note 1: LAFmax level not normally exceeded more than 10 times a night

- 5.17 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).
- 5.18 The ventilation strategy for the development has not yet been confirmed and therefore it is assumed that background ventilation will be provided via trickle ventilators in the building facade. This is a 'worst case' assumption from an acoustic perspective as trickle ventilators are often an acoustic weak point in the facade.
- 5.19 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 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).
- 5.20 If appropriate internal noise levels can be achieved in 'worst case' habitable rooms then it follows that appropriate internal noise levels can be achieved in all other habitable rooms of the development using similar glazing and ventilator types.
- 5.21 Noise from the Morrisons delivery yard has the potential to be more disturbing to the residents than "anonymous" transport noise and is therefore not fully addressed by the ProPG methodology. Guidance on the assessment of noise from commercial and industrial sources is provided in BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. Where a new receptor is introduced to existing commercial noise (such as the refrigeration unit) BS4142 states that the noise should be acknowledged as part of the existing noise environment, and provides examples of applying rating "corrections" to account for potential additional annoyance of this type of noise when compared to the BS8233 (and therefore ProPG) guideline levels.
- 5.22 Using the subjective assessment methodology outlined in BS4142, a character correction for tonality (+6dB for being highly perceptible at the receptor) has been applied to noise from the refrigeration unit in the yard. This corrected noise level has been used in the assessment as per BS4142 guidance. It should also be noted that there are no windows to habitable rooms directly overlooking the refrigeration unit.

5.23 The calculations were carried out based on the following typical dimensions/details for facade elements:

- Glazing – 1.5m² for bedrooms and 2.5m² for living rooms
- External walls – 8m² for bedrooms and 15m² for living rooms
- 2 in-frame trickle ventilators in bedrooms and 3 in-frame trickle ventilators in living rooms.

5.24 Note that if a larger number of trickle ventilators are used then they may need to be of higher performance.

5.25 The results of the calculations are shown in Appendix 3 and are summarised in Table 2 below.

Table 2 Acoustic Requirements for ‘Worst Case’ Habitable Rooms

‘Worst Case’ Rooms	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements (in Open Position)
Bedrooms on western facade overlooking the railway	37 dB Rw+Ctr	45 dB Dne,w + Ctr
Bedrooms overlooking Morrisons Delivery yard on eastern facade	34 dB Rw+Ctr	45 dB Dne,w + Ctr
Bedrooms screened from noise sources	27 dB Rw+Ctr	31 dB Dne,w + Ctr
Living rooms across the development	27 dB Rw+Ctr	31 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.

5.26 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 / Ventilator Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
4/16/4mm standard thermal double glazing	27
10mm/16/8.8mm acoustically upgraded thermal double glazing	34
8mm/16/10.8mm Pilkington Optiphon acoustically upgraded double glazing	37
Ventilators	Typical Acoustic Performance (Dnew + Ctr)
Hit and miss trickle (4000mm ²) e.g. Titon Trimvent XS13	31
Brookvent Tunalsus 290-10	45

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

- 5.27 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the specification 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.
- 5.28 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 but may still require some mitigation (e.g. where partially exposed to rail noise). This can be investigated further at the detailed design stage using detailed 3D noise modelling.
- 5.29 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 will 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.
- 5.30 The development will be subject to Part O of the Building Regulations (Approved Document O). Section 3.2 of Approved Document O (ADO) 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).

- 5.31 The results of the noise survey indicate that areas of the development facing Railway Approach will exceed the noise limits provided in ADO when the windows are opened. The overheating assessment is, therefore, not likely to be able to rely solely on open windows. This will need to be confirmed as part of the overheating assessment during the detailed design stage.

Stage 2 – Element 3 – Noise levels in external amenity areas

- 5.32 BS8233 states 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, BS8233 recognises that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources (i.e. the potential noise impact can be offset by the convenience of living close to transport infrastructure). In these cases, BS8233 states that the development should be designed to achieve the lowest practicable noise levels in the amenity spaces.
- 5.33 Based on the results of the noise survey, noise levels on balconies are expected to exceed the BS8233 recommended levels. However, whilst this is not ideal, in our view, exceeding the BS8233 recommended levels does not normally mean that the 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 BS8233 recommended levels for balconies¹
- 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 resident's health and well-being
- Planners often consider it to be beneficial to the street-scape to have balconies facing roads as they help marry the development to the surrounding area

The current design of the development is, therefore, considered to be acceptable in relation to noise levels in external amenity areas.

Stage 2 – Element 4 – Other relevant issues

- 5.34 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 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.
- 5.35 No significant activity noise was observed from activities within the Morrisons yard (e.g. loading) or other nearby commercial facilities. Significant commercial noise was only observed from the refrigeration unit which has been factored into the assessment above (including appropriate corrections for the potential additional impact) and suitable mitigation has been proposed to result in suitable noise levels. It is therefore our view that a suitable noise environment for residents of the proposed development can still be provided.

Recommendation to decision maker

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

¹ 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. GROUND-BORNE VIBRATION AFFECTING THE DEVELOPMENT

- 6.1 The vibration levels that will exist within the habitable areas of the finished development have been assessed based on the existing ground-borne vibration levels at the site and relevant British Standards.

Design criteria – Ground-borne vibration

- 6.2 Appropriate criteria for ground-borne vibration affecting residential dwellings are given in BS 6472-1:2008 '*Guide to evaluation of human exposure to vibration in buildings - Part 1: Vibration sources other than blasting*'. The criteria in BS6472-1 are provided as Vibration Dose Values, as summarised in Table 4.

Table 4 BS6472-1:2008 Vibration Criteria

Place	Low Probability of Adverse Comment (VDV) $\text{m}\cdot\text{s}^{-1.75\ 1}$	Adverse Comment Possible (VDV) $\text{m}\cdot\text{s}^{-1.75}$	Adverse Comment Probable (VDV) $\text{m}\cdot\text{s}^{-1.75\ 2}$
Residential buildings 16 h day	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential buildings 8 h night	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

- 6.3 Measured ground-borne vibration levels at the site have been assessed against the criteria above.

Existing ground-borne vibration levels

- 6.4 Ground-borne vibration measurements were carried out as part of the site survey. The methodology and results of the measurements are outlined in Appendix 2.
- 6.5 Tri-axial Vibration Dose Value (VDV) measurements were taken across the low-frequency range (1-80Hz) and logged at 10 seconds intervals for approximately one hour, to ensure an adequate quantity of DLR train movements underneath the site. Train timetables indicate that approximately 187 trains pass the site during the daytime, and 20 trains pass the site during the night-time.
- 6.6 Using the measured VDV levels during the survey, the total day and night-time VDV levels have been calculated based on the total number of trains passes that occur on the railway per day and night. The extrapolated VDV levels are summarised below in Table 5.

Table 5 Vibration Data Summary (Vibration Dose Values)

Period	X Axis ($\text{m}\cdot\text{s}^{-1.75}$) Wd	Y Axis ($\text{m}\cdot\text{s}^{-1.75}$) Wd	Z Axis ($\text{m}\cdot\text{s}^{-1.75}$) Wb
Daytime (0700-2300)	0.004	0.004	0.002
Night-time (2300-0700)	0.002	0.002	0.001

- 6.7 It can be seen that vibration levels were highest in the horizontal z and y-axes (compared to the Z axis).
- 6.8 It can be seen from a comparison of Table 4 and Table 5 that vibration levels at the site fall well below the "*Low probability of adverse comment*" rating for both day- and night-time periods according to BS6472.
- 6.9 The results of the BS6472 assessment are in line with subjective opinion formed during the survey that no ground-borne vibration was perceptible.
- 6.10 It is subsequently reasonable to conclude that levels of vibration at the site are acceptable for the proposed development.

7. PLANT NOISE IMPACT ASSESSMENT

- 7.1 It will be important to consider potential noise impact of plant noise emissions from the development affecting nearby sensitive receptors. Appropriate plant noise limits have been identified based on relevant guidance, which can be adopted in the development detailed design.

Design criteria – Mechanical plant noise

- 7.2 BS4142:2014+A1:2019 – *Methods for rating and assessing industrial and commercial sound* (hereafter BS4142) can be used to assess the impact of noise from external industrial and/or commercial noise sources on nearby sensitive receptors.

- 7.3 The BS4142 “initial assessment” methodology can be summarised as follows:

1. Measure the existing background noise levels (LA90,T dB) at the locations of nearby noise sensitive receptors during the quietest periods when the noise source(s) under investigation will operate
2. Predict or measure the noise emissions (LAeq,T dB) from the noise source(s) under investigation at the location(s) of the nearby sensitive receptors, and add corrections for any distinguishable acoustic features (e.g. tones, whines, screeches, hisses etc)
3. Subtract the measured background noise levels (Item 1 above) with the measured or predicted rating noise levels (Item 2 above) at each sensitive receptor. BS4142 states that:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

NOTE Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

- 7.4 It is understood that Adur & Worthing Councils *Planning Noise Advice Document (PNAD)* – Sussex (November 2023) consider “a level no greater than the representative background sound” to be an appropriate criterion for plant noise emissions from new developments within their borough. This criterion has been adopted for the assessment of noise emissions from the development.

- 7.5 Background noise levels (LA90) at the site were measured as part of the site noise survey outlined in Appendix 2. The measured background noise levels have been used to develop limits for plant noise emissions from the new development at the positions of the surrounding residential properties in accordance with the BS4142 assessment methodology and Council PNAD. The limits are shown in Table 6 below.

Table 6 BS4142 Noise Limits - Free-field Levels

Location	Period	
	Day-time/Evening (0700-2300hrs)	Night-time (2300-0700hrs)
Nearest residential properties to new building	52 dB LA _r ,Tr	47 dB LA _r ,Tr

Note 1 The above limits are 'rated' noise levels. Any mechanical plant noise emissions should have appropriate corrections for the character of the noise applied and still meet these limits.

Proposed mechanical plant design

- 7.6 Detailed design information is not yet available for external mechanical plant for the development, and therefore noise emissions from external mechanical plant cannot be accurately predicted at the positions of nearby residential properties at this stage.
- 7.7 The selection and design of external mechanical plant will be reviewed as project information becomes available to ensure that the proposed BS4142:2014 noise limits given in Table 6 are achieved.
- 7.8 It is expected that it will be straightforward to achieve the BS4142 noise limits given the large distances between the new development and the nearby residential properties.

8. CONCLUSIONS

- 8.1 Cass Allen has been instructed by Architectus Ltd to assess noise and vibration affecting a proposed new development at Capella House, Worthing.
- 8.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 8.3 A noise and vibration survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from Broad Water Road and train passes on the Southern Railway. There is occasional noise from HGVs serving the nearby supermarket, and a refrigeration unit.
- 8.4 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.
- 8.5 Compliance with noise criteria in Building Regulations Part O has also been assessed. Bedrooms 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.
- 8.6 Ground-borne vibration levels at the site have been measured and are negligible.
- 8.7 Appropriate limits for noise emissions from any mechanical plant associated with the proposed development have been identified.
- 8.8 In summary, it is our view that the site is suitable for the development in terms of noise and vibration levels and that planning permission may be granted.

Appendix 1 Development Layout



Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise and vibration 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:

14/07/2025 to 21/07/2025

Survey Objectives:

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

Equipment Used:

Type	Manufacturer	Model	Serial Number
Calibrator	Rion	NC-74	34551703
Sound level meter ¹	Rion	NL-52	00965090
Sound level meter ¹ (noise logger)	Rion	NL-52	01182950
Sound level meter ¹ (noise logger)	Rion	NL-52	01182950
Tri-Axial Vibration Meter	Rion	XV-2P	00380055
Tri-axial accelerometer	Rion	PV-83C	73649

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.

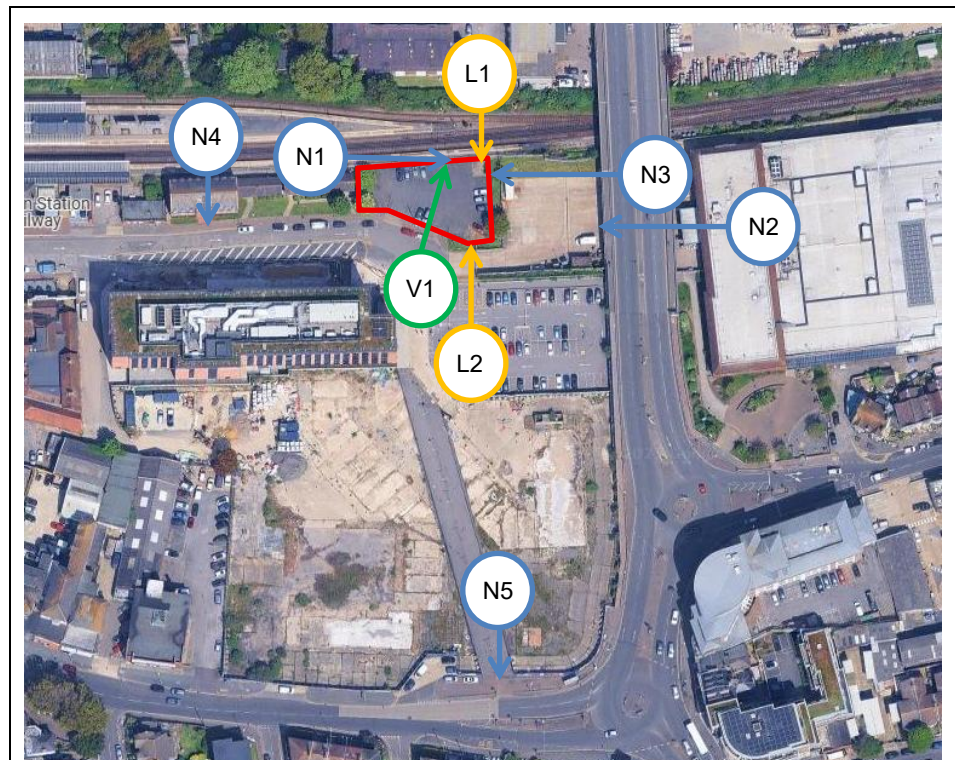
Measurement Positions:

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Southern Railway.
N2	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Broadwater Road.
N3	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to plant in delivery yard.

Measurement Positions:

Position (refer plan below)	Description
N4	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Railway Approach.
N5	Attended noise monitoring position. 1.5m above ground. Free-field. Direct line of sight to Teville Road.
L1	Unattended noise logging position. 3m above ground level. Free-field. Direct line of sight to Southern Railway line.
L2	Unattended noise logging position. 3m above ground level. Free-field. Direct line of sight to Morrisons Yard entrance.
V1	Attended ground-borne vibration monitoring position, at the closest part of the proposed building to the railway line. The vibration measurements were taken on top of dry, compacted earth using appropriate DIN plate and contact spikes.

Site Plan showing Measurement Positions:



Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LAmix, dB	LA90, dB	Observations
14/07/2025	N1	18:22	13 secs	74	81	62	Train passing measurement location leaving the station ~7m away
		18:24	12 secs	66	71	62	Train passing measurement location entering the station ~5m away

Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LAmx, dB	LA90, dB	Observations
	N2	18:40	5 mins	71	80	63	Noise predominantly from road traffic on Broad Water Road. Loudest level from moped passing location. Noise was also heard from train to the north ~40m away. Background level from road traffic and plant running in Morrisons yard to the northeast ~25m away.
		18:45		70	81	63	
		18:50		73	96	65	
		18:56	6 secs	70	74	66	Car passing measurement position ~3m away
		18:56	5 secs	71	74	67	Car passing measurement position ~5m away
		18:59	6 secs	71	76	64	Car passing measurement position ~3m away
	N3	19:04	7 secs	66	68	63	Plant measurement: refrigeration unit ~4m away from position
		19:05	15 secs	65	67	63	
		19:05	20 secs	65	67	63	
		19:06	12 secs	65	67	63	
21/07/2025	N3	16:21	20 secs	65	68	64	Plant measurement: refrigeration unit ~4m away from position
		16:22	16 secs	65	68	64	
	N4	16:27	12 secs	78	87	60	Motorbike passing measurement position ~10m away
		16:30	5 mins	56	70	49	Noise dictated by pedestrians talking and walking pass position and nature sound (i.e. birdsong). Background noise levels primarily from road traffic on Broad Water Road. Very few vehicle movements on Railway Approach. Loudest level from car pass.
		16:35		54	68	49	
		16:40		54	69	50	
		16:46	5 secs	57	60	54	Car passing position ~10m away
		16:47	6 secs	58	61	56	
		16:47	8 secs	55	58	51	Car passing position ~8m away
	N5	16:55	5 mins	67	86	60	Noise dictated by road traffic on Teville Road. Loudest level from motorbike passing measurement position. Shouts and vehicle movement was also heard from construction site to the northwest.
		17:00		66	77	59	
		17:05		63	70	58	Similar to the previous measurements but no noise was heard from the construction area
	N1	17:24	13 secs	71	82	60	Train entering the station ~5m away
		17:24	10 secs	74	81	67	Train leaving the station ~7m away

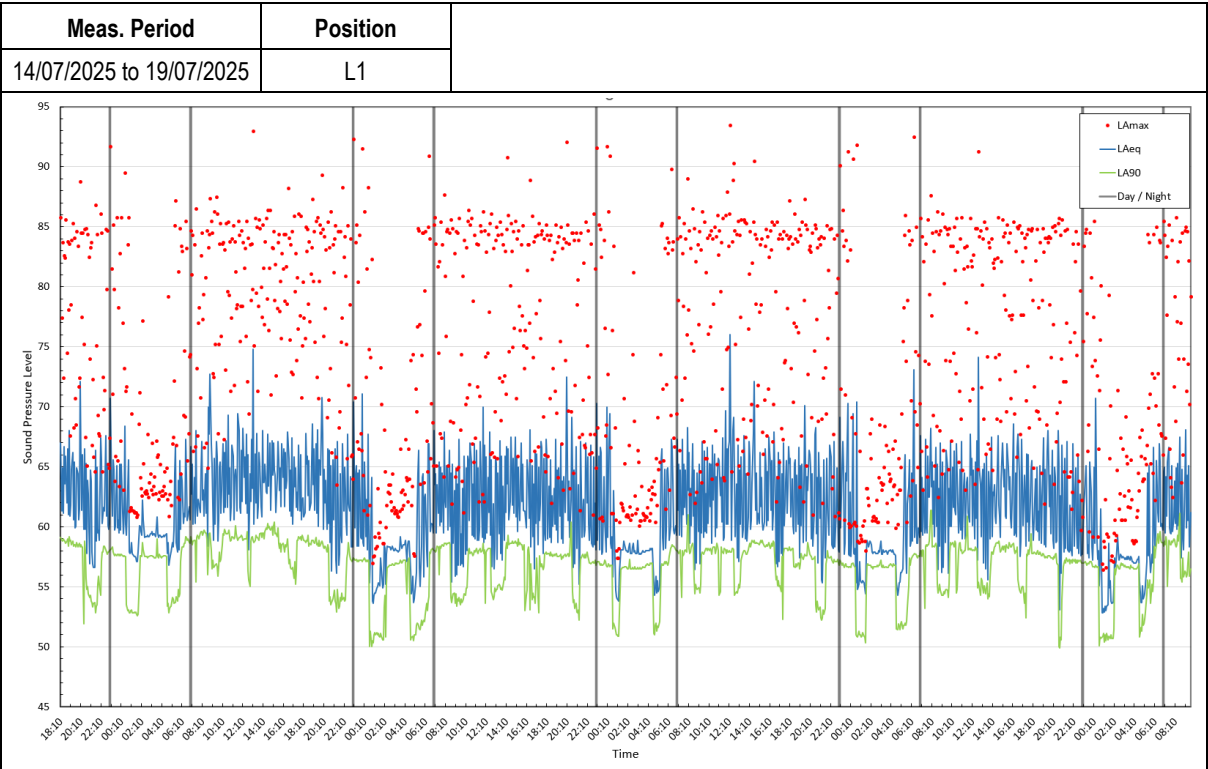
Unattended Noise Monitoring Results:

Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB ¹	LAeq,8hr, dB	LA90,5mins, dB ¹	LAmx, dB ²
14/07/2025 to 19/07/2025	L1	64	57	61	55	85
14/07/2025 to 19/07/2025	L2	62	52	56	47	77

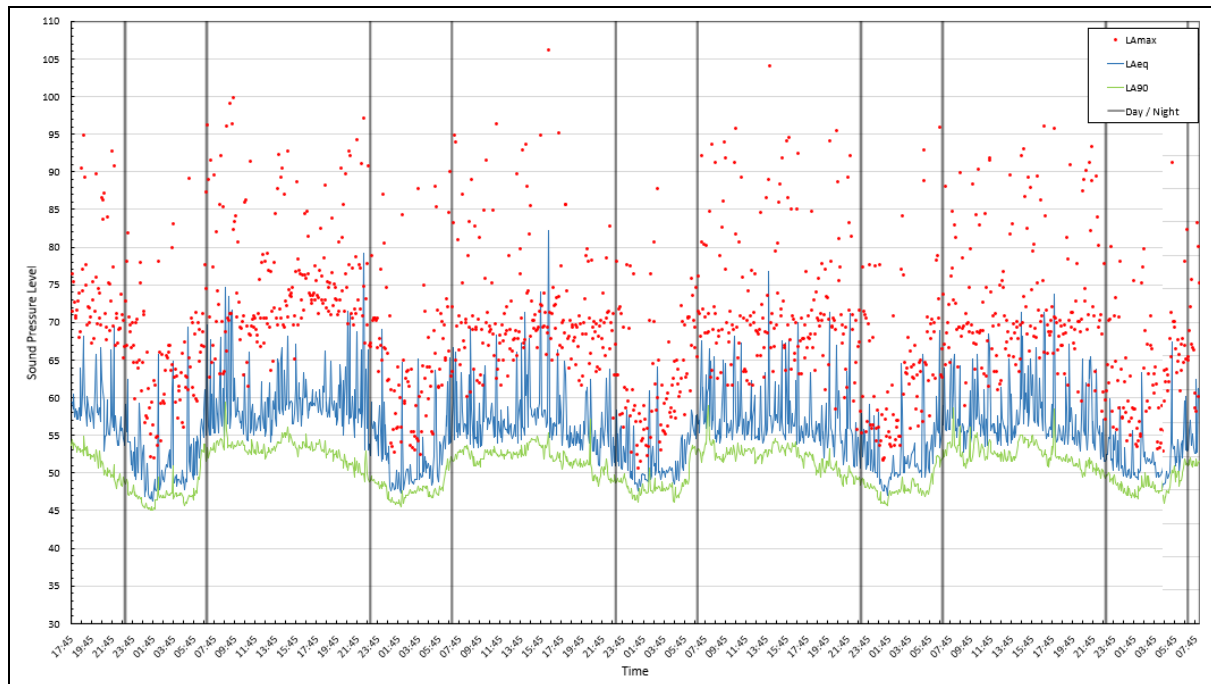
Note 1: Typical lowest measured during the period shown.

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

Unattended Noise Monitoring Results:



Meas. Period	Position
14/07/2025 to 19/07/2025	L2



Attended Ground-borne Vibration Monitoring Results:

Date	Position	Time	Meas. Length	X VDV	Y VDV	Z VDV	Observations
21/07/2025	V1	16:24:00	10 secs	0.00064	0.00064	0.00024	Train pass on railway
		16:27:50		0.00068	0.00068	0.00026	
		16:31:00		0.00098	0.00098	0.00038	
		16:33:00		0.00085	0.00086	0.0003	
		16:42:50		0.00068	0.00068	0.00026	
		16:51:40		0.00073	0.00074	0.00028	
		17:01:50		0.00091	0.00091	0.00035	
		17:04:50		0.00096	0.00096	0.00037	
		17:08:10		0.00068	0.00069	0.00026	
		17:11:30		0.00077	0.00076	0.00029	
		17:21:00		0.0009	0.00091	0.00035	
		17:26:10		0.00097	0.00097	0.00037	

Note 1: Vibration measurements were taken across the low-frequency range (1-80Hz)

Appendix 3 Facade Calculations

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PROJECT: Capella House, Worthing
 ROOM: Bedroom - East Façade
 VARIANT: Worst-Case Daytime Average Noise Level (LAeq)
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$
 Room Volume = 28.8 m³
 Partition Area = 9.5 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)

Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	62.0							
		43.8	47.9	51.4	54.8	58.0	55.2	50.0
								Reference spectrum

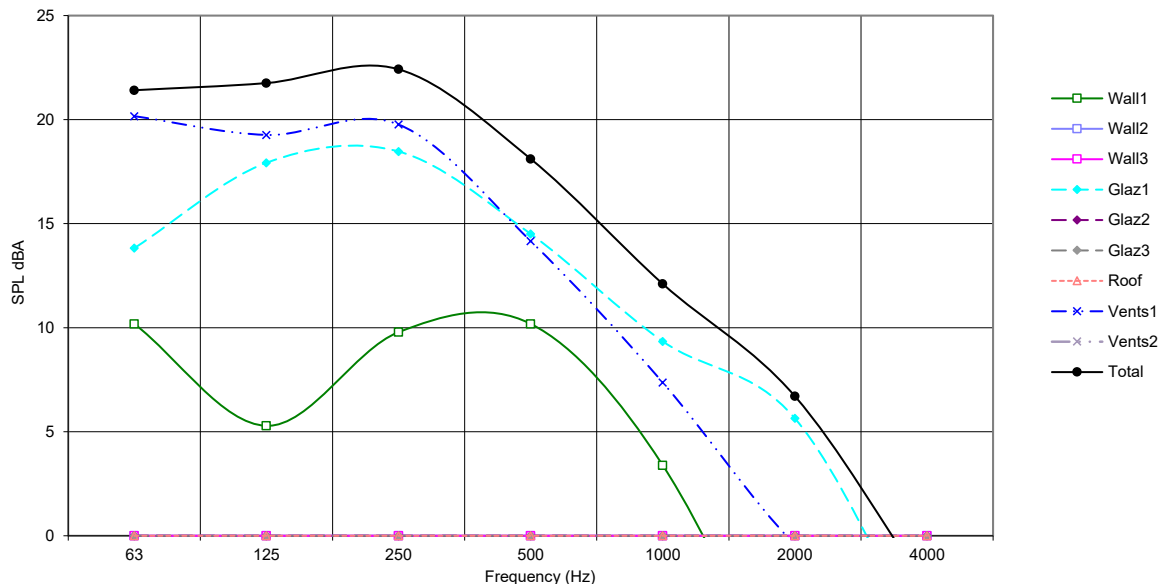
REVERBERATION TIME

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 ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	7%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 34 dB Rw + Ctr - High Acoustic Performance Double Glazing	1.5	25	25	28	35	44	45	51	36%	34 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		32	33	36	42	51	53	59				
Resultant SPL inside room excluding ventilators dB	23.7	15	18	19	16	10	6	-5	42%			

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								D _{nw}	C	Ctr
Ventilation Brookvent TunalSus 250-10	2	30	35	38	47	57	62	62	57%	51	-1	-6
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	25.0	20	19	20	14	7	0	-6	58%			
Total SPL inside room	27.4	21	22	22	18	12	7	-3				

Element contribution to total internal noise level



PROJECT: Capella House, Worthing
ROOM: Bedroom - East Facade
VARIANT: Worst-Case Night Road Traffic Average Noise Level (LAeq)
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$

Room Volume = 28.8 m³
Partition Area = 9.5 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)

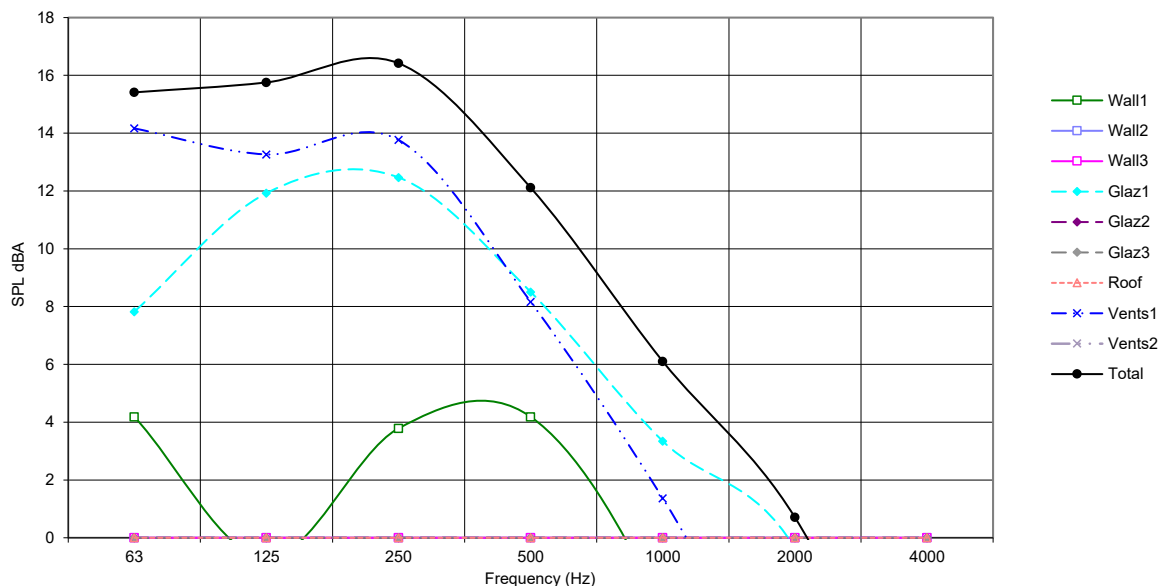
EXTERNAL SPECTRUM (A weighted)		dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->		-								No data
Road traffic spectrum (according to BS 8233:1999 section 6)		56.0								
			37.8	41.9	45.4	48.8	52.0	49.2	44.0	Reference spectrum

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 ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	6%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 34 dB Rw + Ctr - High Acoustic Performance Double Glazing	1.5	25	25	28	35	44	45	51	35%	34 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		32	33	36	42	51	53	59				
Resultant SPL inside room excluding ventilators dB	17.7	9	12	13	10	4	0	-11	42%			

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Brookvent TunalSus 250-10	2	30	35	38	47	57	62	62	56%	51	-1	-6
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	19.0	14	13	14	8	1	-6	-12	58%			
Total SPL inside room	21.4	15	16	16	12	6	1	-9				

Element contribution to total internal noise level

PROJECT: Capella House, Worthing
ROOM: Bedroom - East Facade
VARIANT: Worst-Case Plant average noise level +6 dB Tonality and -13 dB Dist Correction
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$

Room Volume = 28.8 m³
Partition Area = 9.5 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 ----->	57.4	35.7	41.3	54.1	50.7	49.8	46.9
Road traffic spectrum (according to BS 8233:1999 section 6)							
	35.7	41.3	54.1	50.7	49.8	46.9	40.6

Direct input

REVERBERATION TIME

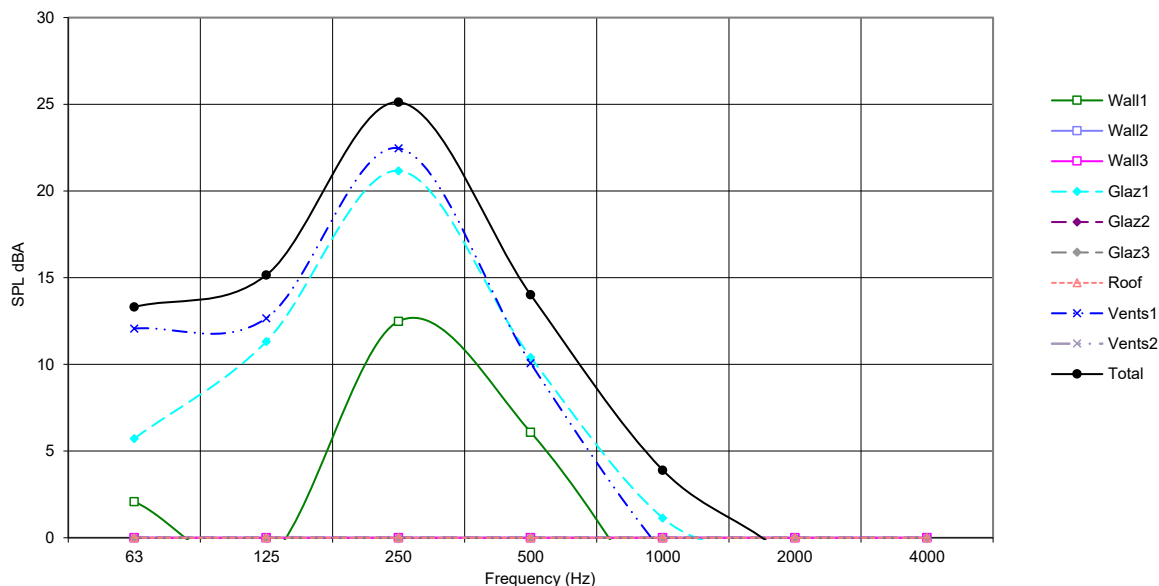
DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								
	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block ATTENUATION	8.0	36	45	44	47	57	67	77	6%	54	0	-4
Wall 2 WALLS ATTENUATION		0	0	0	0	0	0	0	0%			
Wall 3 WALLS ATTENUATION		0	0	0	0	0	0	0	0%			
Glazing 1 34 dB Rw + Ctr - High Acoustic Performance Double Glazing ATTENUATION	1.5	25	25	28	35	44	45	51	39%	34 (inc Ctr)	-	-
Glazing 2 GLAZING ATTENUATION		0	0	0	0	0	0	0	0%			
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		32	33	36	42	51	53	59				
Resultant SPL inside room excluding ventilators dB		22.7	7	12	22	12	2	-3	-15	46%		

Ventilator Type	Num	D _{n,e} dB to BS EN 20140-10:1992								D _{nw}	C	Ctr
Ventilation Brookvent TunalSus 250-10 ATTENUATION	2	30	35	38	47	57	62	62	54%	51	-1	-6
Ventilation VENTS ATTENUATION		0	0	0	0	0	0	0	0%			
Resultant SPL inside room through ventilators dB		23.5	12	13	22	10	-1	-9	-15	54%		

Total SPL inside room

26.1	13	15	25	14	4	-2	-12
------	----	----	----	----	---	----	-----

Element contribution to total internal noise level

PROJECT: Capella House, Worthing
ROOM: Bedroom - East Façade
VARIANT: Worst-Case Maximum Noise Level (L_{Amax})
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$

Room Volume = 28.8 m³
Partition Area = 9.5 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)

EXTERNAL SPECTRUM (A weighted)		dBA	63	125	250	500	1000	2000	4000
Direct input - Free Field SPL (A weighted octave bands) dB ----->		77.8	57.4	60.0	65.8	73.4	73.5	68.7	64.8
Road traffic spectrum (according to BS 8233:1999 section 6)									
			57.4	60.0	65.8	73.4	73.5	68.7	64.8

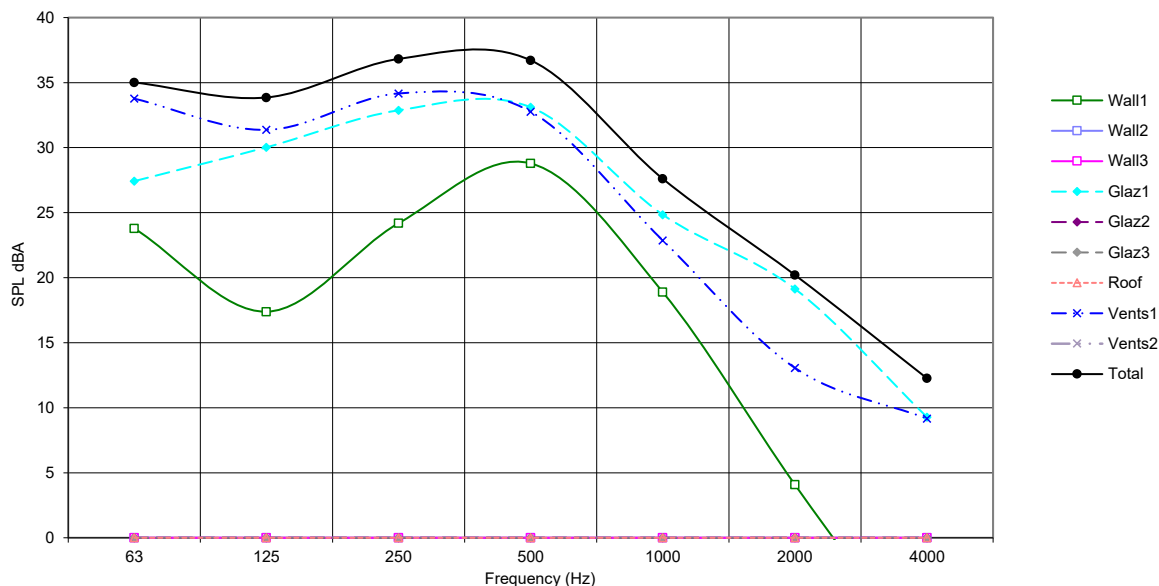
REVERBERATION TIME

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 ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	9%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 34 dB Rw + Ctr - High Acoustic Performance Double Glazing	1.5	25	25	28	35	44	45	51	38%	34 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		32	33	36	42	51	53	59				
Resultant SPL inside room excluding ventilators dB		38.6	29	30	33	34	26	19	9	46%		

Ventilator Type	Num	D _{n,e} dB to BS EN 20140-10:1992								D _{nw}	C	Ctr
Ventilation Brookvent TunalSus 250-10	2	30	35	38	47	57	62	62	54%	51	-1	-6
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		39.3	34	31	34	33	23	13	9	54%		
Total SPL inside room		42.0	35	34	37	37	28	20	12			

Element contribution to total internal noise level



PROJECT:	Capella House, Worthing	Room Dimensions [m]	W	X	L	X	H
ROOM:	Bedroom		3.0		4.0		2.4
VARIANT:	Daytime Average Noise Level (LAeq) -10 dB for screening						
NOTES:	Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.						

Room Volume = 28.8 m³
 Partition Area = 9.5 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)

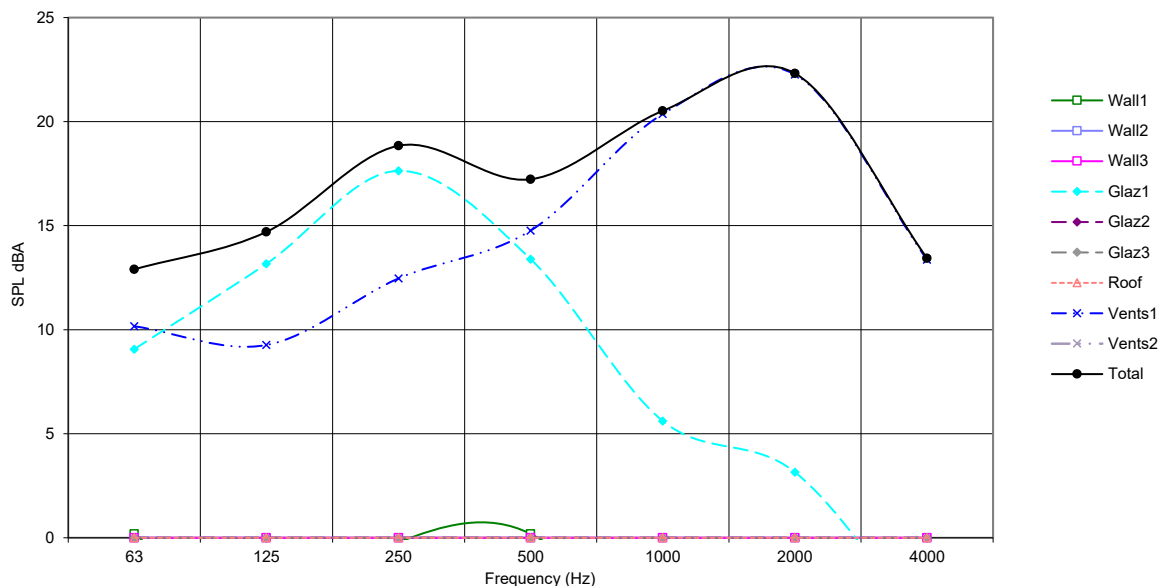
EXTERNAL SPECTRUM (A weighted)		dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->		-								No data
Road traffic spectrum (according to BS 8233:1999 section 6)		52.0								
			33.8	37.9	41.4	44.8	48.0	45.2	40.0	Reference spectrum

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 ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	0%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 27 dB Rw + Ctr - Standard Thermal Double Glazing	1.5	20	20	19	27	38	37	40	24%	27 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		27	28	27	34	45	45	48				
Resultant SPL inside room excluding ventilators dB	20.7	10	13	18	14	6	3	-4	24%			

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Hit and miss trickle (4000mm ²) e.g. Titon Trimvent XS13	2	30	35	35	36	34	29	33	75%	32	0	-1
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	25.6	10	9	12	15	20	22	13	76%			
Total SPL inside room	26.8	13	15	19	17	21	22	13				

Element contribution to total internal noise level

PROJECT: Capella House, Worthing
ROOM: Bedroom
VARIANT: Night Average Noise Level (LAeq) -10 dB for screening
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix} \times \begin{matrix} L \\ 4.0 \end{matrix} \times \begin{matrix} H \\ 2.4 \end{matrix}$

Room Volume = 28.8 m³
Partition Area = 9.5 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)

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)		46.0								
			27.8	31.9	35.4	38.8	42.0	39.2	34.0	Reference spectrum

REVERBERATION TIME

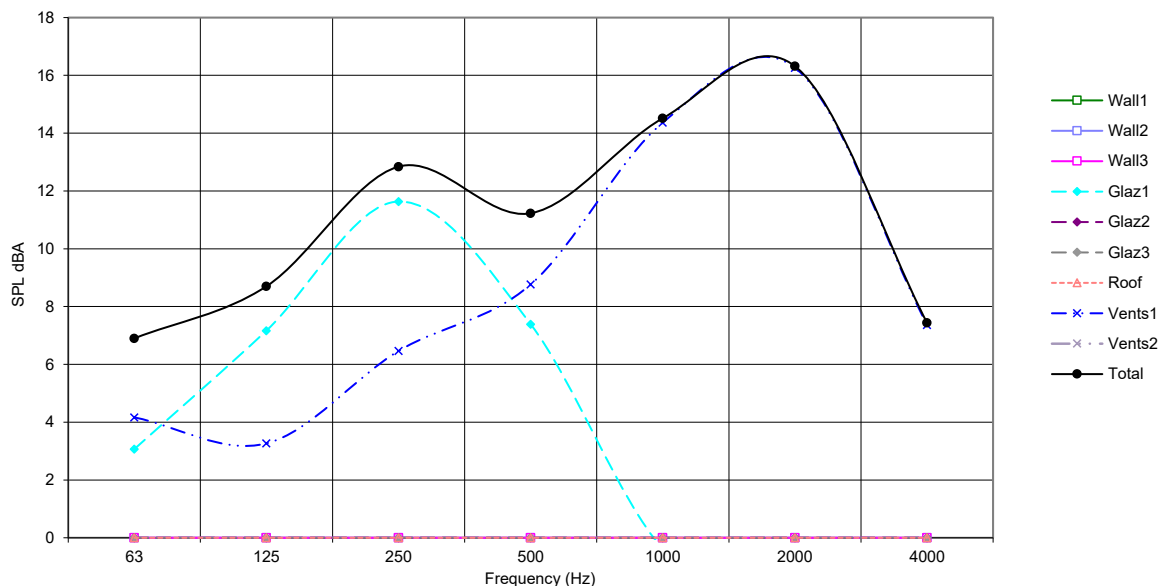
DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	1%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 27 dB Rw + Ctr - Standard Thermal Double Glazing	1.5	20	20	19	27	38	37	40	23%	27 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		27	28	27	34	45	45	48				
Resultant SPL inside room excluding ventilators dB		14.7	4	7	12	8	0	-3	-10	24%		

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Hit and miss trickle (4000mm ²) e.g. Titon Trimvent XS13	2	30	35	35	36	34	29	33	72%	32	0	-1
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		19.6	4	3	6	9	14	16	7	76%		

Total SPL inside room

20.8	7	9	13	11	15	16	7
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Element contribution to total internal noise level

PROJECT: Capella House, Worthing
ROOM: Bedroom
VARIANT: Maximum Noise Level (LAmax) -10 dB for screening
NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$

Room Volume = 28.8 m³
Partition Area = 9.5 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)

EXTERNAL SPECTRUM (A weighted)		dBA	63	125	250	500	1000	2000	4000
Direct input - Free Field SPL (A weighted octave bands) dB ----->		71.0	50.6	53.2	59.0	66.6	66.7	61.9	58.0
Road traffic spectrum (according to BS 8233:1999 section 6)									
			50.6	53.2	59.0	66.6	66.7	61.9	58.0

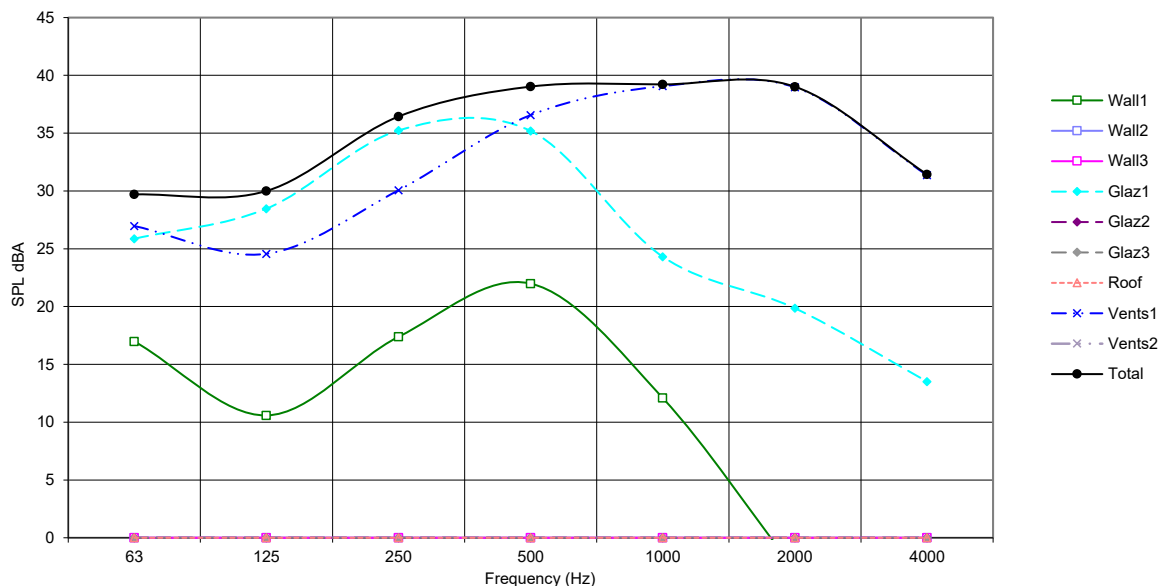
50.6 53.2 59.0 66.6 66.7 61.9 58.0 Direct input

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 ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	1%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 27 dB Rw + Ctr - Standard Thermal Double Glazing	1.5	20	20	19	27	38	37	40	25%	27 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		27	28	27	34	45	45	48				
Resultant SPL inside room excluding ventilators dB		39.2	26	29	35	35	25	20	14	26%		

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Hit and miss trickle (4000mm ²) e.g. Titen Trimvent XS13	2	30	35	35	36	34	29	33	74%	32	0	-1
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		43.7	27	25	30	37	39	39	31	74%		
Total SPL inside room		45.1	30	30	36	39	39	39	31			

Element contribution to total internal noise level

PROJECT: Capella House, Worthing
 ROOM: Living Room
 VARIANT: Worst-Case Average Noise Level (LAeq)
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 4.0 \end{matrix} \times \begin{matrix} L \\ 5.0 \end{matrix} \times \begin{matrix} H \\ 2.4 \end{matrix}$
 Room Volume = 48.0 m³
 Partition Area = 17.5 m²
 Ventilation ref area = 10.0 m²
 Free Field SPL K = 3 dB

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

EXTERNAL SPECTRUM (A weighted)

Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	52.0							
		33.8	37.9	41.4	44.8	48.0	45.2	40.0
								Reference spectrum

REVERBERATION TIME

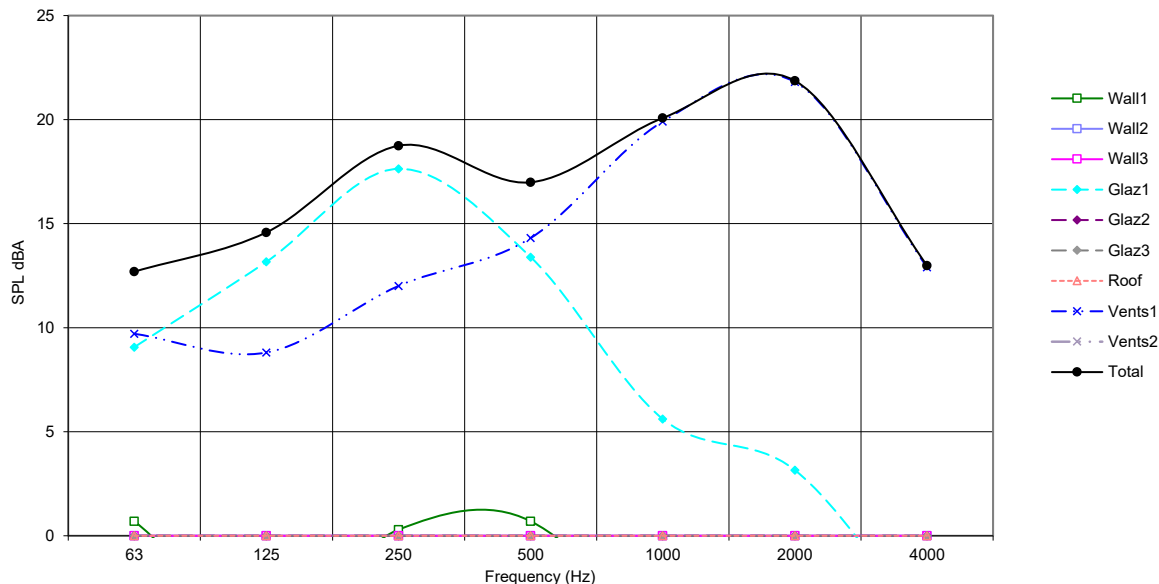
DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->	0.5	0.5	0.5	0.5	0.5	0.5	0.5	Default - RT set to 0.5s

Façade Element	Area [m ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	15.0	36	45	44	47	57	67	77	0%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 27 dB Rw + Ctr - Standard Thermal Double Glazing	2.5	20	20	19	27	38	37	40	26%	27 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		28	28	27	35	46	46	48				
Resultant SPL inside room excluding ventilators dB	20.7	10	13	18	14	6	3	-4	27%			

Ventilator Type	Num	D _{n,e} dB to BS EN 20140-10:1992								D _{nw}	C	Ctr
Ventilation Hit and miss trickle (4000mm ²) e.g. Tilton Trimvent XS13	3	30	35	35	36	34	29	33	73%	32	0	-1
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	25.2	10	9	12	14	20	22	13	73%			

Total SPL inside room **26.5** 13 15 19 17 20 22 13

Element contribution to total internal noise level



NOTES:

PROJECT: Capella House, Worthing
 ROOM: Bedroom - Railway
 VARIANT: Daytime Average Noise Level (LAeq) -3 dB for screening
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$
 Room Volume = 28.8 m³
 Partition Area = 9.5 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)

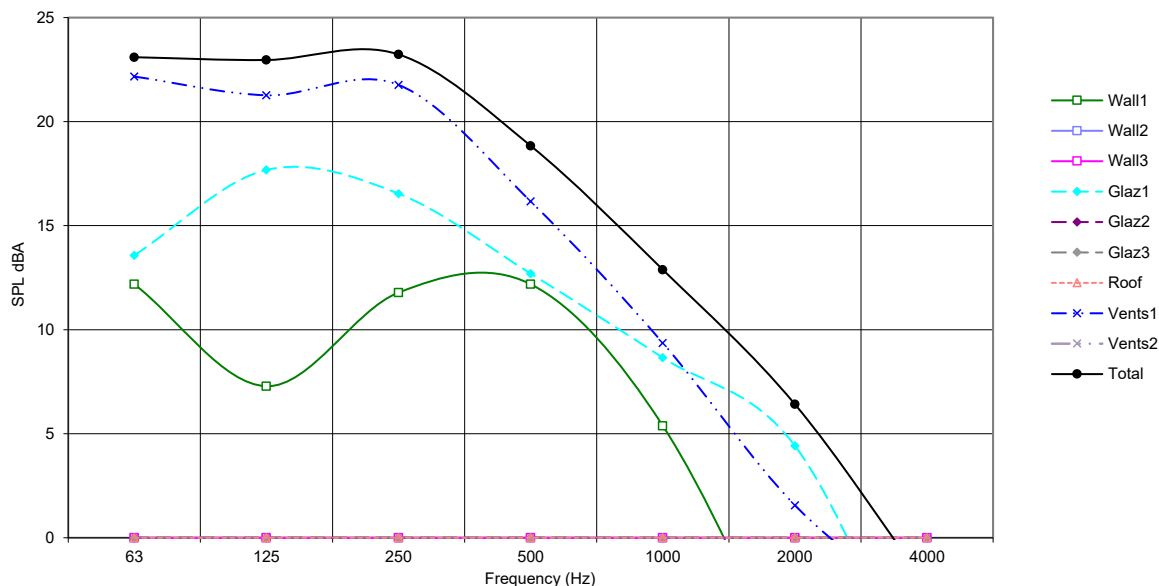
EXTERNAL SPECTRUM (A weighted)		dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->		-								No data
Road traffic spectrum (according to BS 8233:1999 section 6)		64.0								
			45.8	49.9	53.4	56.8	60.0	57.2	52.0	Reference spectrum

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 ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block ATTENUATION	8.0	36	45	44	47	57	67	77	8%	54	0	-4
Wall 2 WALLS ATTENUATION		0	0	0	0	0	0	0	0%			
Wall 3 WALLS ATTENUATION		0	0	0	0	0	0	0	0%			
Glazing 1 37 dB Rw + Ctr - High Acoustic Performance Double Glazing ATTENUATION	1.5	27	27	32	39	46	48	55	22%	37 (inc Ctr)	-	-
Glazing 2 GLAZING ATTENUATION		0	0	0	0	0	0	0	0%			
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		33	35	39	44	53	56	63				
Resultant SPL inside room excluding ventilators dB		23.3	16	18	18	15	10	5	-8	30%		

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Brookvent TunalSus 250-10 ATTENUATION	2	30	35	38	47	57	62	62	70%	51	-1	-6
Ventilation VENTS ATTENUATION		0	0	0	0	0	0	0	0%			
Resultant SPL inside room through ventilators dB		27.0	22	21	22	16	9	2	-4	70%		
Total SPL inside room		28.5	23	23	23	19	13	6	-2			

Element contribution to total internal noise level

PROJECT: Capella House, Worthing
 ROOM: Bedroom - Railway
 VARIANT: Night Average Noise Level (LAeq) -3 dB for screening
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$
 Room Volume = 28.8 m³
 Partition Area = 9.5 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)

Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	61.0							
		42.8	46.9	50.4	53.8	57.0	54.2	49.0
								Reference spectrum

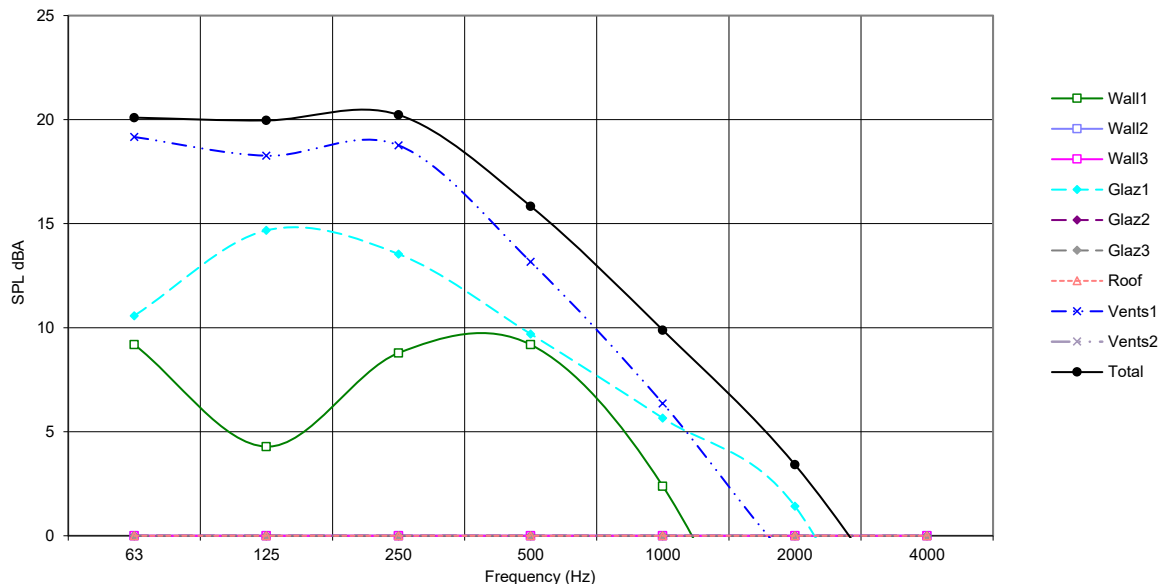
REVERBERATION TIME

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 ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	8%	54	0	-4
ATTENUATION												
Wall 2 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Wall 3 WALLS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Glazing 1 37 dB Rw + Ctr - High Acoustic Performance Double Glazing	1.5	27	27	32	39	46	48	55	21%	37 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING		0	0	0	0	0	0	0	0%			
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		33	35	39	44	53	56	63				
Resultant SPL inside room excluding ventilators dB	20.3	13	15	15	12	7	2	-11	30%			

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								D _{nw}	C	Ctr
Ventilation Brookvent TunalSus 250-10	2	30	35	38	47	57	62	62	69%	51	-1	-6
ATTENUATION												
Ventilation VENTS		0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB	24.0	19	18	19	13	6	-1	-7	70%			
Total SPL inside room	25.5	20	20	20	16	10	3	-5				

Element contribution to total internal noise level



PROJECT: Capella House, Worthing
 ROOM: Bedroom - Railway
 VARIANT: Maximum Noise Level (LAmax) -3 dB for screening
 NOTES: Typical assumptions used for ext. wall & glazing dimensions, and no. ventilators.

Room Dimensions [m] $\begin{matrix} W \\ 3.0 \end{matrix}$ X $\begin{matrix} L \\ 4.0 \end{matrix}$ X $\begin{matrix} H \\ 2.4 \end{matrix}$
 Room Volume = 28.8 m³
 Partition Area = 9.5 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)

Direct input - Free Field SPL (A weighted octave bands) dB ----->

dBA	63	125	250	500	1000	2000	4000
81.6	61.2	63.8	69.6	77.2	77.3	72.5	68.6

Road traffic spectrum (according to BS 8233:1999 section 6)

61.2 63.8 69.6 77.2 77.3 72.5 68.6 Direct input

REVERBERATION TIME

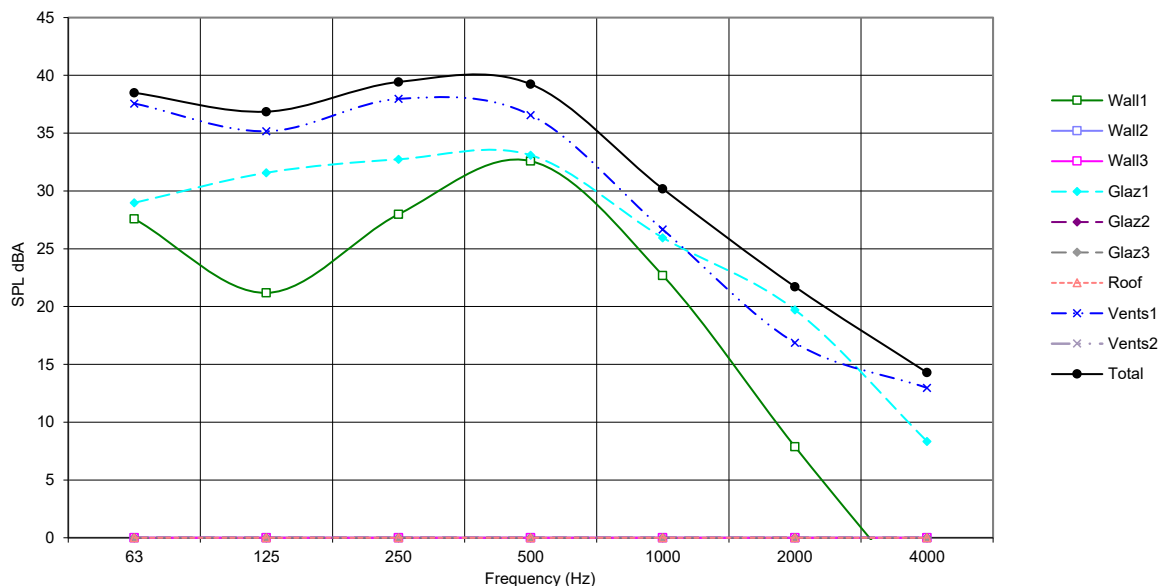
DIRECT INPUT -----> ☐ No data
 EQUAL RT for all bands -----> ☐ 0.5 0.5 0.5 0.5 0.5 0.5 0.5 Default - RT set to 0.5s

Façade Element	Area [m ²]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1 Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	11%	54	0	-4
ATTENUATION												
Wall 2 WALLS	0	0	0	0	0	0	0	0	0%			
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	1.5	27	27	32	39	46	48	55	22%	37 (inc Ctr)	-	-
ATTENUATION												
Glazing 2 GLAZING	0	0	0	0	0	0	0	0	0%			
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		33	35	39	44	53	56	63				
Resultant SPL inside room excluding ventilators dB		40.0	31	32	34	36	28	20	9	33%		

Ventilator Type	Num	D _{na} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation Brookvent TunalSus 250-10	2	30	35	38	47	57	62	62	67%	51	-1	-6
ATTENUATION												
Ventilation VENTS	0	0	0	0	0	0	0	0	0%			
ATTENUATION												
Resultant SPL inside room through ventilators dB		43.1	38	35	38	37	27	17	13	67%		

Total SPL inside room 44.8 38 37 39 39 30 22 14

Element contribution to total internal noise level





Architectural & Environmental Consultants

Acoustics | Vibration | Air Quality

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