**Report VA6030.250827.NIA**

# 1-2 Dems House, Storrington

Noise Impact Assessment

**29 August 2025**

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## Attachments


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| VA6030/SP1 | Indicative Site Plan |
| VA6030/TH1-TH6 | Environmental Noise Time Histories |
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| Appendix A | Acoustic Terminology |

| Report Version | Author | Approved | Changes | Date |
|---|---|---|---|---|
| NIA | Steven Liddell | Ben Alexander | - | 28/08/2025 |

The interpretations and conclusions summarised in this report represent Venta Acoustics' best technical interpretation of the data available to us at the time of assessment. Any information provided by third parties and referred to in this report has not been checked or verified by Venta Acoustics, unless otherwise expressly stated in the document. Venta Acoustics cannot accept any liability for the correctness or validity of the information provided. Due to a degree of uncertainty inherent in the prediction of all parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or wilful negligence on our part, be liable for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretations, predictions of conclusions made by the company or employees. The findings and conclusions are relevant to the period of the site survey works, and should not be relied upon to represent site conditions at later dates. Where additional information becomes available which may affect the findings of our assessment, the author reserves the right to review the information, reassess the findings and modify the conclusions accordingly.

# 1. Introduction

An application is to be submitted for the conversion of the first floor of 1-2 Dems House, Storrington from commercial to residential use under Class MA of the General Permitted Development Order.

Venta Acoustics has been commissioned by Hancoda Ltd to undertake an assessment of the current environmental noise impact on the site and provide recommendations of acoustic mitigation where required in support of an application for planning permission.

An environmental noise survey has been undertaken to determine the noise levels incident on the site. These levels are then used to undertake an assessment of the likely impact in accordance with the National Planning Policy Framework with reference to relevant standards, guidance.

Outline mitigation measures are considered and an appraisal of the requirements of external building fabric elements are provided where appropriate.

# 2. Guidance and Legislation

## 2.1 Permitted Development – Class MA

Class MA of the General Permitted Development Order provides the following requirements.

***Conditions***

***MA.2.*** *(1) Development under Class MA is permitted subject to the conditions*

*(2) Before beginning development under Class MA, the developer must apply to the local planning authority for a determination as to whether the prior approval of the authority will be required as to—*

*(a) transport impacts of the development, particularly to ensure safe site access;*

*(b) contamination risks in relation to the building;*

*(c) flooding risks in relation to the building;*

*(d) impacts of noise from commercial premises on the intended occupiers of the development;*

*(e) (e)where—*

*(I )the building is located in a conservation area, and*

*(ii) the development involves a change of use of the whole or part of the ground floor,*

*the impact of that change of use on the character or sustainability of the conservation area;*

*(f) the provision of adequate natural light in all habitable rooms of the dwellinghouses;*

*(g) the impact on intended occupiers of the development of the introduction of residential use in an area the authority considers to be important for general or heavy industry, waste management, storage and distribution, or a mix of such uses; and*

*(h) where the development involves the loss of services provided by—*

*(i) a registered nursery, or*

*(ii )a health centre maintained under section 2 or 3 of the National Health Service Act 2006(4),the impact on the local provision of the type of services lost.*

*(3) An application for prior approval for development under Class MA may not be made before 1 August 2021.*

*(4) The provisions of paragraph W (prior approval) of this Part apply in relation to an application under this paragraph as if in the introductory words in sub-paragraph (5), for "and highways impacts of the development" there were substituted "impacts of the development, particularly to ensure safe site access".*

*(5) Development must be completed within a period of 3 years starting with the prior approval date.*

*(6) Any building permitted to be used as a dwellinghouse by virtue of Class MA is to remain in use as a dwellinghouse within the meaning of Class C3 of Schedule 1 to the Use Classes Order and for no other purpose, except to the extent that the other purpose is ancillary to the use as a dwellinghouse.".*

Part 3, paragraph W(10)(b) of the GPDO states that the local planning authority must, when determining an application, have regard to the National Planning Policy Framework so far as relevant to the subject matter of the prior approval as if the application were a planning application.

## 2.2 The National Planning Policy Framework (2024)

The revised *National Planning Policy Framework* (NPPF), published in December 2024, sets out the Government's planning polices for England, superseding all previous planning policy statements and guidance.

In respect of noise, the NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing developments from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution.

Hence, Paragraph 198 states that *planning policies and decisions should also ensure 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 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*

In regards to the term adverse impact, reference is made to the Noise Policy for England:

## 2.3 Noise Policy Statement for England (2010)

The Noise Policy Statement for England (NPSE) sets out the long term vision of Government noise policy: to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

This vision is supported by the following aims:

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

The terms “significant adverse” and “adverse” are related to the following concepts:

No Observed Effect Level (NOEL) - *the level below which no effect on health and quality of life can be detected*.

Lowest Observed Adverse Effect Level (LOAEL) - *the level above which adverse effects on health and quality of life can be detected*.

Significant Observed Adverse Effect Level (SOAEL) - *the level above which significant adverse effects on health and quality of life occur*.

The guidance acknowledges that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations, but will be different for different noise sources, receptors and times.

In order to enable assessment of impacts in line with these requirements, reference should be made to other currently available guidance.

## 2.4 BS4142:2014+A1:2019

British Standard BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* describes a method for rating and assessing sound of an industrial and/or commercial nature, which includes sound from fixed installations comprising mechanical and/or electrical plant and equipment;

The assessment methodology considers the Specific Sound Level, as measured or calculated at a potential noise sensitive receptor, due to the source under investigation. A correction factor is added to this level to account for the acoustic character of the sound as follows:

**Tonality –** A correction of up to 6dB depending on the prominence of tones;

**Impulsivity -** A correction of up to 9dB depending on the prominence of impulsivity;

**Other sound characteristics -** A 3dB correction may be applied where a distinctive acoustic character is present that is neither tonal nor impulsive;

**Intermittency -** A 3dB correction may be applied where the specific sound has identifiable on/off conditions.

An estimate of the impact of the source is obtained by subtracting the typical background noise level from the corrected Specific Sound Level.

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB could be an indication of an adverse impact, depending on the context.

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

## 2.5 WHO Guidelines for Community Noise (1999)

The guidance in this document details suitable noise levels for various activities within residential and commercial buildings.

The relevant sections of this document are shown in Table 2.1.

| Criterion | Environment | Design range $L_{Aeq,T}$ dB |
|---|---|---|
| Maintain speech intelligibility and avoid moderate annoyance, daytime and evening | Living Room | 35 dB |
| Prevent sleep disturbance, night time | Bedrooms | 30 dB |

**Table 2.1 – Excerpt from WHO** **[dB ref. 20µPa]**

This guidance also states:

> *For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB $L_{Amax}$ more than 10-15 times a night (Vallet & Vernet 1991).*

## 2.6 BS8233:2014

BS8233 *Guidance on sound insulation and noise reduction for buildings* provides guidance as to desirable internal ambient noise levels for different areas within residential buildings.

The relevant section of the standard is shown below in Table 2.2.

| Activity | Location | 07:00 to 23:00 | 23:00 to 07:00 |
|---|---|---|---|
| Resting | Living Room | 35 dB $L_{Aeq, 16\ hour}$ | - |
| Dining | Dining Room | 40 dB $L_{Aeq, 16\ hour}$ | - |
| Sleeping (daytime resting) | Bedroom | 35 dB $L_{Aeq, 16\ hour}$ | 30 dB $L_{Aeq, 8\ hour}$ |

**Table 2.2 – Excerpt from BS8233:2014 - Indoor ambient noise levels for dwellings [dB ref. 20µPa]**

# 3. Site Description

As illustrated on the attached site plan VA6030/SP1, the application site comprises the first floor of a semi-detached building. The ground floor accommodates a florist and an electronics store, while the first floor is occupied by office uses and a dog grooming salon.

Access is via Mill Parade to the north, beyond which are offices with an associated car park. To the east lies a pedestrian path, with a sister building situated beyond. This sister building contains restaurants at ground floor level and existing residential accommodation at first and second floors.

To the south is a large public car park serving the wider area, including the Waitrose supermarket located further south. To the west is a fuel station with an associated two-storey convenience store. This structure provides screening of the site from the forecourt; however, cooling plant is located to the rear (east) elevation of the store.

Noise levels during the day are generally controlled by traffic on the surrounding roads and, to a lessor extent, within the car park.

The dominant commercial noise sources affecting the site were identified as mechanical services plant. Specifically, these include cooling plant associated with the convenience store to the west, which operates intermittently throughout a 24-hour period, and a smaller refrigeration unit serving the florist at ground floor level of the application building. Lesser contributions to the local noise climate arise from slow-moving traffic within the adjacent car park and from deliveries to the Waitrose supermarket to the south.

# 4. Environmental Noise Survey

## 4.1 Survey Procedure & Equipment

In order to establish the existing background noise levels at the site, a noise survey was carried out between Wednesday 6th August and Friday 8th August 2025 at first floor level at the locations shown in site plan VA6030/SP1. These locations were chosen to be representative of the noise levels at the front and rear façades of the building.

Continuous 5-minute samples of the $L_{Aeq}$, $L_{Amax}$, $L_{A10}$ and $L_{A90}$ sound pressure levels were undertaken at each of the measurement locations.

The weather during the survey period was generally dry with light winds. The background noise data is not considered to have been compromised by these conditions.

Measurements were made generally in accordance with ISO 1996 2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels*.

The following equipment was used in the course of the survey:

| Manufacturer | Model Type | Serial No | Calibration | |
|---|---|---|---|---|
| | | | Certificate No. | Date |
| NTi Class 1 Integrating SLM | XL2 | A2A-11461-E0 | 1509201-1 | 19/7/24 |
| NTi Class 1 Integrating SLM | XL2 | A2A-12202-E0 | 1511238-2 | 14/2/25 |
| Larson Davis calibrator | CAL200 | 19816 | 1512828-1 | 16/7/25 |

**Table 4.1 – Equipment used for the survey**

The calibration of the sound level meter was verified before and after use with no significant calibration drift observed.

## 4.2 Results

The measured sound levels are shown as time-history plots on the attached charts VA6030/TH1-3 for position 1 at the front (south) of the building and VA6030/TH4-6 for position 2 at the rear (north) of the building.

The site is primarily affected by neighbouring building services plant which is seen to turn on and off intermittently during the day and night.

Daytime noise levels are generally modest at both the front and rear of the site, with the similarity in levels indicating that the acoustic environment is primarily influenced by traffic on Old Mill Drive rather than by the car park or adjacent access road.

At night, the neighbouring plant determines the sound levels at both the front ($L_{Aeq}$ 47dB) and, to a lesser extent, the rear ($L_{Aeq}$ 34dB).

To the rear, the florist plant operates less frequently and generates sound level of around $L_{Aeq}$ 56dB at 1m from the plant, equating to approximately 45dB at the nearest first floor window of 1-2 Dems House, which is partially screened. Noise from this plant is not observed at the front façade.

No delivery noise is identified in the survey data with the exception of a possible delivery by small van to the florist which did not show as a prominent increase in sound level on the charts. Peaks in measured sound levels were attributed to maintenance / construction activities taking place in the carpark on the morning of Friday 8$^{th}$ and bin collections on the morning of Thursday 7$^{th}$. Other events

include bird song, dogs barking and an occasional events such as cars revving in the carpark. Overall, these are sounds entirely congruent with the context of the area and sufficiently infrequent as to not be considered intrusive.

The average noise levels for the Daytime and Night-time periods, as measured at the automated monitoring position were:

| Monitoring Period | $L_{Aeq, T}$ | | Typical[1] $L_{A90,5min}$ | | Typical[2] $L_{Amax, fast}$ | |
|---|---|---|---|---|---|---|
| | Front | Rear | Front | Rear | Front | Rear |
| 07:00 – 23:00 | 52 dB | 54 dB | 43 dB | 40 dB | - | - |
| 23:00 – 07:00 | 51 dB | 44 dB | 26 dB | 26 dB | 66 dB | 66 dB |

**Table 4.2 – Average ambient and typical background noise levels**

[1] The typical $L_{A90}$ value is taken as the 10th percentile of all $L_{A90}$ values measured during the relevant period.

[2] The typical $L_{Amax}$ value is taken as the value not exceeded more than 10-15 times per night

N.B Levels have not been corrected for façade reflections (nominally -3dB correction).

# 5. BS4142 Noise Impact Assessment

## 5.1 Source Noise Levels

Observations on site confirmed that noise from the plant associated with the neighbouring convenience store and the florist are the noise sources potentially affecting the proposed new dwellings. Sound levels emitted from activities at these premises were measured. In addition to this, potential noise from deliveries, which are based upon library data measured at other, similar sites are included. These are summarised in Table 5.1.

Sound from vehicles in the carpark are not associated with a specific commercial use and are at moderate levels that would be considered entirely reasonable for traffic noise. Deleveries to the surrounding small retail units were not notable in the survey data and would generally be infrequent and via van or small lorry that would be congruent with the general traffic noise and not stand out as a noteworthy commercial source.

| Noise Source | Measurement Distance | Measured $L_{Aeq}$ | Notes |
|---|---|---|---|
| Convenience Store Plant | At Façade | 47dB | 50Hz + 315Hz tone. Intermittent |
| Florist Store Plant | At Façade | 45dB | 100Hz tone. Intermittent but less frequent |
| Lorry manoeuvring | Library data | 73dB @ 8m | |
| Lorry loading/ unloading | Library data | 61dB @ 5m | |

**Table 5.1 – Measured and library data noise sources used for assessment**

## 5.2 Acoustic Character Correction

The subjective method of allocating corrections to the sound source has been used following the methodology provided in BS4142:2014 and summarised in section 2.4.

| Noise Source | Subjective Description | Allocated Corrections |
|---|---|---|
| Plant | Modest tonal elements and intermittent operation | Tonality: +4dB<br>Impulsivity: 0dB<br>Intermittency: +3dB |
| Lorry Manoeuvring | Potentially tonality of reversing alarm | Tonality: +4dB<br>Impulsivity: 0dB<br>Intermittency: dB |

**Table 5.2 – Acoustic character corrections**

These penalties are applied to the specific noise level in section 5.3 to obtain the rating level.

## 5.3 Rating Level and Assessment

The rating levels at the assessment locations are compared against the relevant background noise levels to assess the notional significance of the noise impact as follows. Operations are adjusted to the appropriate on times.

The following tables summarise the assessments of commercial noise on the most affected façade of the new dwellings.

| Results | Front | Rear | Relevant Clause | Commentary |
|---|---|---|---|---|
| Source Sound Levels | 47dB | 45dB | 7.3.4<br>7.3.5 | As measured on site |
| Assume 30% on time | -5dB | -5dB | 7.2 | Operates approx. 5 mins at a time |
| Acoustic feature correction | +7 dB | +7dB | 9.2 | +3 dB for intermittency, +4dB for tonality |
| Rating level | $L_{Ar}$ 49 dB | $L_{Ar}$ 47 dB | 9.2 | |
| Night time background sound level | $L_{A90}$ 26 dB | $L_{A90}$ 26 dB | 8 | |
| Excess of rating over background sound level | +23 dB | +21 | 11 | |
| Assessment indicates significant adverse impact if not mitigated | | | 11 | Depending on context |

**Table 5.3 – BS4142 Assessment - Plant**

| Results | Assessment | Relevant Clause | Commentary |
|---|---|---|---|
| Lorry manoeuvring | $L_{Aeq}$ 73 dB @8m | | Based on data from other sites |
| Distance correction to 115m | -23 dB | | |
| Acoustic feature correction | +4 dB | 9.2 | Possible tonality of reversing alarm |
| On-time correction (2mins/hr) | -15 dB | | |
| Rating level | $L_{Ar}$ 39 dB | 9.2 | |
| Background sound level | $L_{A90}$ 43 dB | 8 | As measured during the day |
| Excess of rating over background sound level | -4dB | 11 | |
| Assessment indicates a low impact | | 11 | Depending on context |
| Context | In a mixed use area with traffic on surrounding roads, the deliveries which occur occasionally and for limited duration are expected to represent a low impact | | |

**Table 5.1 - BS4142 Assessment – Waitrose Deliveries**

## 5.4 Context

The BS4142 standard aims to cover a wide variety of situations under the same base assessment methodology and so has some inherent shortcomings. To allow for this, the guidance encourages consideration of the site context as a means of adapting the base assessment to specific scenarios.

The site is located in a mixed use area with existing residential and commercial elements. The noise levels experienced at the building façades are considered modest in absolute terms, with noise from road traffic and the car parks etc expected to be at reasonable levels within dwellings with open windows and well controlled with standard-specification windows closed.

Sound from plant is the primary commercial concern. This is below the ambient traffic noise levels during the day, being faintly audible but not particularly prominent.

There are no set standards for the assessment of commercial noise internally. However, with a moderate external impact during the day, and resulting internal noise levels likely to be well below the BS8233 guideline limits (including character corrections), this would not preclude occupants from opening windows and the internal impact would likely be low during the day.

At night the impact is higher if not mitigated. The base assessment methodology is considered to be weighted towards the more sensitive case of assessing industrial noise upon an existing residential receiver. The introduction of a new residential use to an area with existing sources of commercial noise provides an opportunity to provide appropriate mitigation against the noise sources.

Mitigation at the source or along the propagation path would not be achievable in this situation. However, the use of appropriately specified external building fabric elements can readily control the noise impact. This would allow appropriate internal noise levels to be achieved such that the commercial noise source is not considered to be disruptive.

This allows the impact to be significantly reduced for occupants within the dwellings and is considered below. The new dwellings are not proposed to have any external amenity areas and hence internal noise levels are how future residents would experience the noise.

## 5.5 Uncertainty

This section considers the variable in the assessment that may cause variations within the final results and describes how these have been addressed.

- Use of Class 1 sound level meters is considered to reduce instrument error to insignificant levels as compared with environmental variations. The calibration of the instrumentation was confirmed before and after the noise surveys.
- The background measurements were undertaken under suitable weather conditions over a period designed to include reasonable temporal variations in noise levels.
- Two monitoring locations were selected to minimise local acoustic phenomenon that may affect a single measurement location. hese measurement locations were selected to be

representative of the noise levels expected to be experienced by the proposed dwellings without being unduly influenced by extraneous noise sources.

- Source data was of particular noise sources was measured on site at the receiver, where possible. These measurements were undertaken in a manner that best represented noise emissions from the source to the assessment locations without being unduly influenced by extraneous noise sources. This methodology minimised the uncertainty introduced in sound propagation calculations.
- Where library data has been used, propagation calculations have been used to correct noise levels to the relevant distance at the receiver.

Overall, the uncertainty is considered to have been minimised to a suitable range so as not to risk significant variations in the impact assessment of typical operations.

# 6. Internal Noise Assessment

To control noise from the commercial uses, the glazing specification will be selected to provide sufficient sound insulation such that the Rating Level (including BS4142 character penalties) is controlled to below the internal guideline values in BS 8233:2014. This hybrid assessment approach of applying BS4142 penalties to commercial noise and comparing against BS8233 criteria over a shortened reference period is endorsed in the ProPG: Planning & Noise (prepared by the Institute of Acoustics, the Chartered Institute of Environmental Health, and the Association of Noise Consultants).

Class MA of the GPDO considers only commercial noise impacts, excluding traffic noise. However, the measured ambient noise levels from road traffic are modest. The corrected free-field levels of $L_{Aeq,16hr}$ 49dB (front) and $L_{Aeq,16hr}$ 51dB (rear) are only 14-16 dB above the BS8233 guideline value of 35 dB for internal daytime levels. Allowing for a typical 15 dB sound reduction from a partially open window, internal levels would be approximately 34-36 dB $L_{Aeq}$. These levels meet, or are very close to, the BS8233 criteria, meaning suitable internal conditions can be achieved without relying solely on closed windows. The development therefore allows future residents to open windows for ventilation without being exposed to intrusive traffic noise.

### *6.1.1 Sound Reduction Performances of Building Elements*

It has been assumed that all the non-glazed elements, i.e. walls and roof systems, will be capable of providing the following minimum sound insulation performance, when tested in accordance with BS EN ISO 10140-2:2021 *Acoustics - Laboratory measurement of sound insulation of building elements – Part 2: Measurement of airborne sound insulation*.

| Building Element | Single figure weighted sound reduction index, dB |
|---|---|
| Roof | $R_w$ 45 |
| Masonry | $R_w$ 51 |

**Table 6.1 – Assumed sound reductions performances of non-glazed elements**

### 6.1.2 Sound Reduction Performance of Windowsets and Vents

The monitoring data along with the architectural drawings have been used to calculate the required sound insulation performance for the windowsets (glazing and frame combination) and open ventilators for the building. These are summarised in Table 6.2 below.

| Glazing Reference | Required Glazing SRI, dB | Ventilator Performance, dB |
|---|---|---|
| All | $R_w$ 27 | $D_{n,e,w}$ 36[1] |

**Table 6.2 – Required minimum sound reduction indices for glazing and ventilators**

Where trickle vents are used, the performance shown in Table 6.2 will be required. The figures stated are for a single vent per room. If multiple vents are required, then the performance requirement shown in Table 6.2 will increase by a value equal to +10log(*N*), with N being the total number of vents serving the room. It should be noted that there is no reason why windows could not be opened as a matter of personal preference or for purge ventilation.

### 6.1.3 Windowset Performances

The above performance is expected to be achieved by standard glazing.

It is important that the performance shown in Table 6.2 is achieved by the entire windowset including frames, ventilators, seals, etc. Glass performance alone would not be likely to show compliance with the specification as the other elements typically provide the weakest noise transmission path.

The ventilator performances provided would need to be achieved with the vents open. Should this performance not be achievable, a mechanical ventilation solution may be required.

## 7. Sound Insulation Tests

Investigative sound insulation tests were undertaken between the ground and first floor level of the existing building on 6th August 2025 in accordance with BS EN ISO *140 Acoustics – Measurement of sound insulation in buildings and of building elements Part 4: Field measurements of airborne sound insulation between rooms*, as is appropriate for residential sound insulation testing.

High volume 'pink' noise was generated from a loudspeaker in the source room, positioned so as to obtain a diffuse sound field within the spaces. A spatial average of the resulting one-third octave band noise levels was obtained within both the source and the receive rooms.

Background noise levels were measured in the receive rooms in order to correct the received noise measurements for the influence of the prevailing noise climate as in accordance with BS EN 140 part 4.

[1] For reference only, GPDO does not include consideration of ventilation.

The prevailing background noise in the building was due to traffic on the nearby roads.

The following equipment was used for the sound insulation tests.

| Manufacturer | Model Type | Serial No | Calibration | |
|---|---|---|---|---|
| | | | Certificate No. | Date |
| Svantek Class 1 SLM | 971 | 143563 | 00002984-1 | 19/9/24 |
| Larson Davis calibrator | CAL200 | 13049 | 1512828-2 | 16/7/25 |
| Electro Voice | ZLX-12P-EX | 095208361761760076 | - | - |

**Table 7.1 – Equipment used for the tests**

## 7.2 Test Results

The results of the test is presented in attached figure VA6030/AB1, as summarised in the table below.

| Source Room | Receive Room | Partition Type | Test Type | Measured Performance |
|---|---|---|---|---|
| GF Retail | 1F Office Area | Floor | Airborne | $D_{nT,w} + C_{tr}$ 43dB |

**Table 7.2 – Airborne Sound Insulation Test Results.**
N.B Higher values of $D_{nT,w} + C_{tr}$ represent a better performance.

For comparative purposes, Table 7.3 shows the relevant current sound insulation requirements for converted dwellings. For commercial to residential adjacencies, an improvement of at least 5dB over this is recommended.

| Test Type | Test Element | Minimum ADE Requirement |
|---|---|---|
| Airborne Sound Insulation | Walls and Floors | $D_{nT,w} + C_{tr} \geq 43$ dB |

**Table 7.3 – ADE 2003 and design values for airborne and impact sound insulation (conversion)**
NB Higher values of $D_{nT,w} + C_{tr}$ represent better airborne sound insulation.

## 7.3 Current Sound Insulation Performance

As the results show, the sound insulation performance of the floor is moderate, suggestive of a standard internal cassette floor.

The above construction would not be expected to provide sufficient sound insulation to protect the residents above from higher noise levels in the space below. It is recommended that the floor/ceiling separating ground and first floor is uprated to the following minimum construction.

- The existing floorboards should be removed and the void between the joists filled with a minimum of 100mm mineral wool (density 10-33kg/$m^3$)
- Replace existing floorboards with 18mm chipboard T+G deck **OR** Level and seal up existing floorboards (sealing up between boards should be with a non-hardening mastic, if overlaying then chipboard T+G deck should be used)

- Existing ceiling removed and new metal frame ceiling grid installed to create a new ceiling at least 250mm below underside of the subfloor (and more if possible)
- New plasterboard ceiling comprising two layers 15mm dense plasterboard such as SoundBloc or similar (minimum mass 11kg/$m^2$ per board), joints staggered and skimmed

This is expected to be sufficient to control noise between a standard commercial use (excluding gyms, pubs etc) .

Should the ground floor tenant be a high noise generating use, it is usual for the onus to be placed on the tenant to uprate the sound insulation accordingly.

# 8. Conclusion

Venta Acoustics was commissioned to undertake a noise impact assessment for the proposed conversion of the first floor of 1-2 Dems House, Storrington, to residential use. An environmental noise survey identified the dominant noise source impacting the site as cooling plant from adjacent commercial premises, particularly during the night-time period.

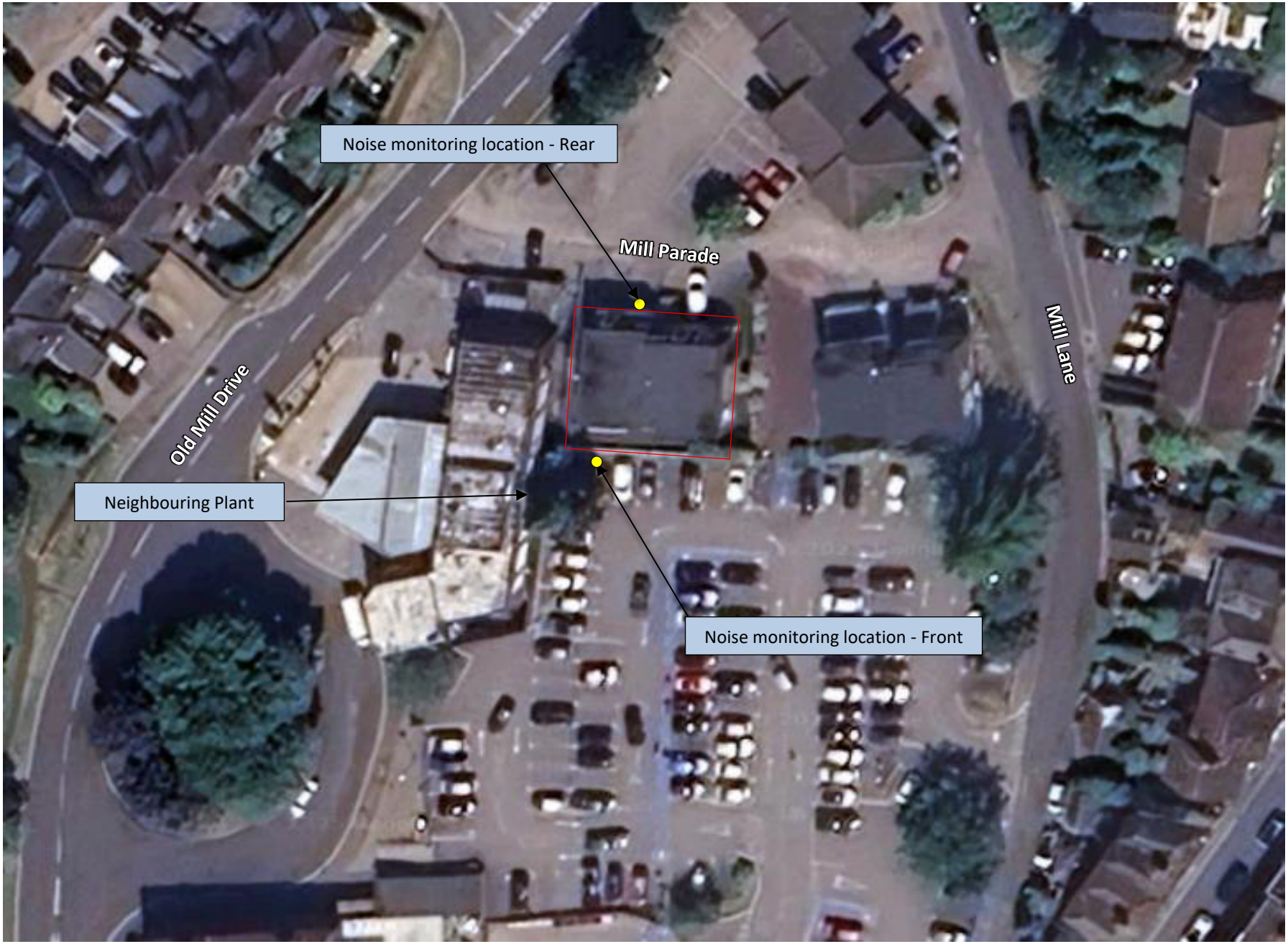
An assessment in accordance with BS 4142:2014+A1:2019 indicated that, without mitigation, noise from this plant would result in a significant adverse impact at the proposed dwellings during the night. Noise from other sources, such as daytime deliveries to a nearby supermarket and the car park, were found to have a low impact.

To mitigate against the plant noise, a acoustic performance specification for the glazing system has been provided. This is expected to be achieved with standard thermal double glazing.

Sound insulation testing of the separating floor between ground and first floor level showed a modest level of sound insulation. Recommendations to improve this have been provided.

With the implementation of these detailed mitigation measures, the assessment concludes that appropriate internal noise conditions can be achieved. The development is therefore considered suitable for its proposed residential use and compliant with the noise-related requirements of the National Planning Policy Framework and Class MA of the General Permitted Development Order.

**Steven Liddell MIOA**


Noise monitoring location - Rear
Mill Parade
Old Mill Drive
Mill Lane
Neighbouring Plant
Noise monitoring location - Front

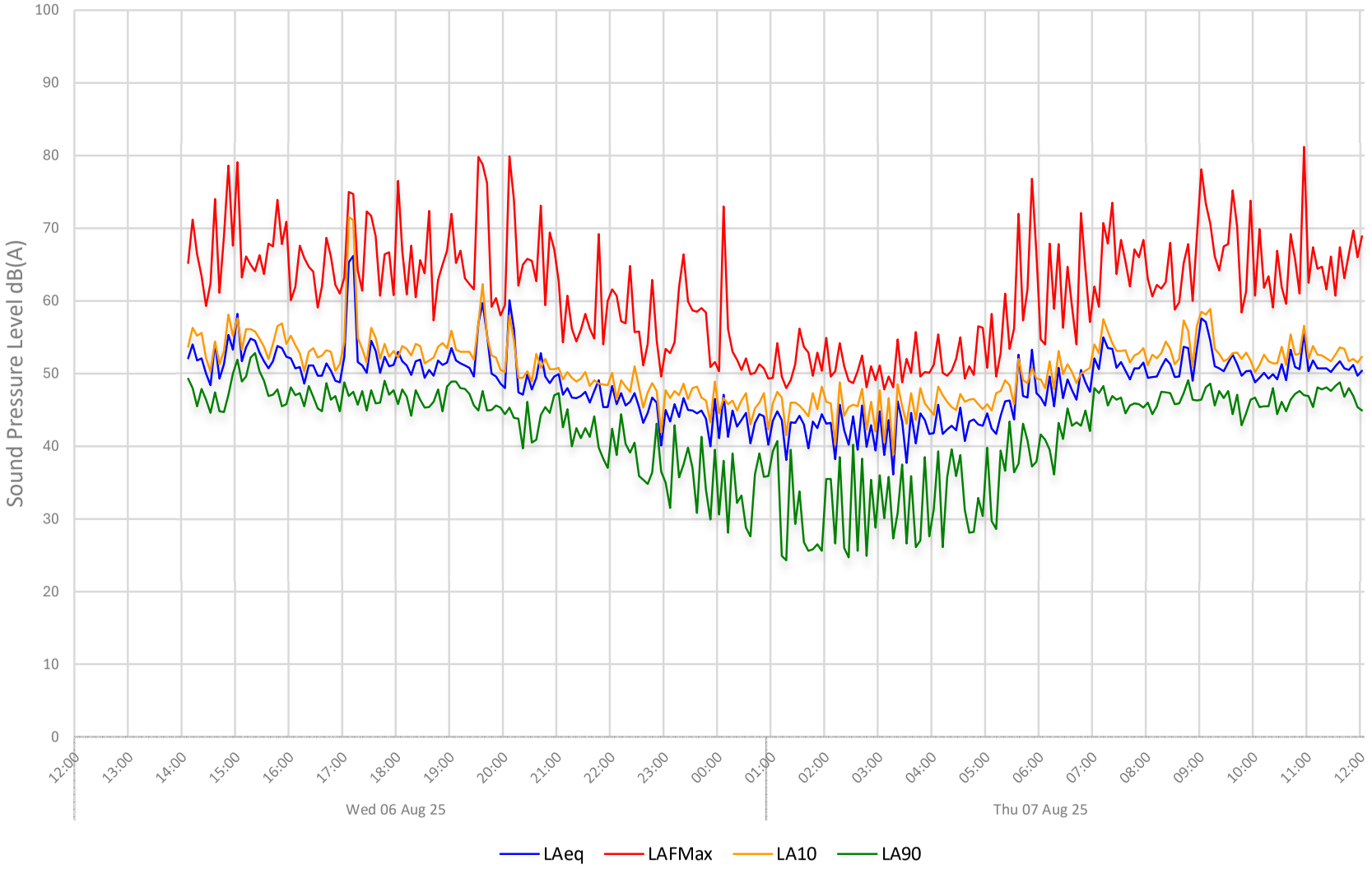
1-2 Dems House, Storrington

Environmental Noise Time History: 1

Front

VENTA ACOUSTICS

Figure VA6030/TH1



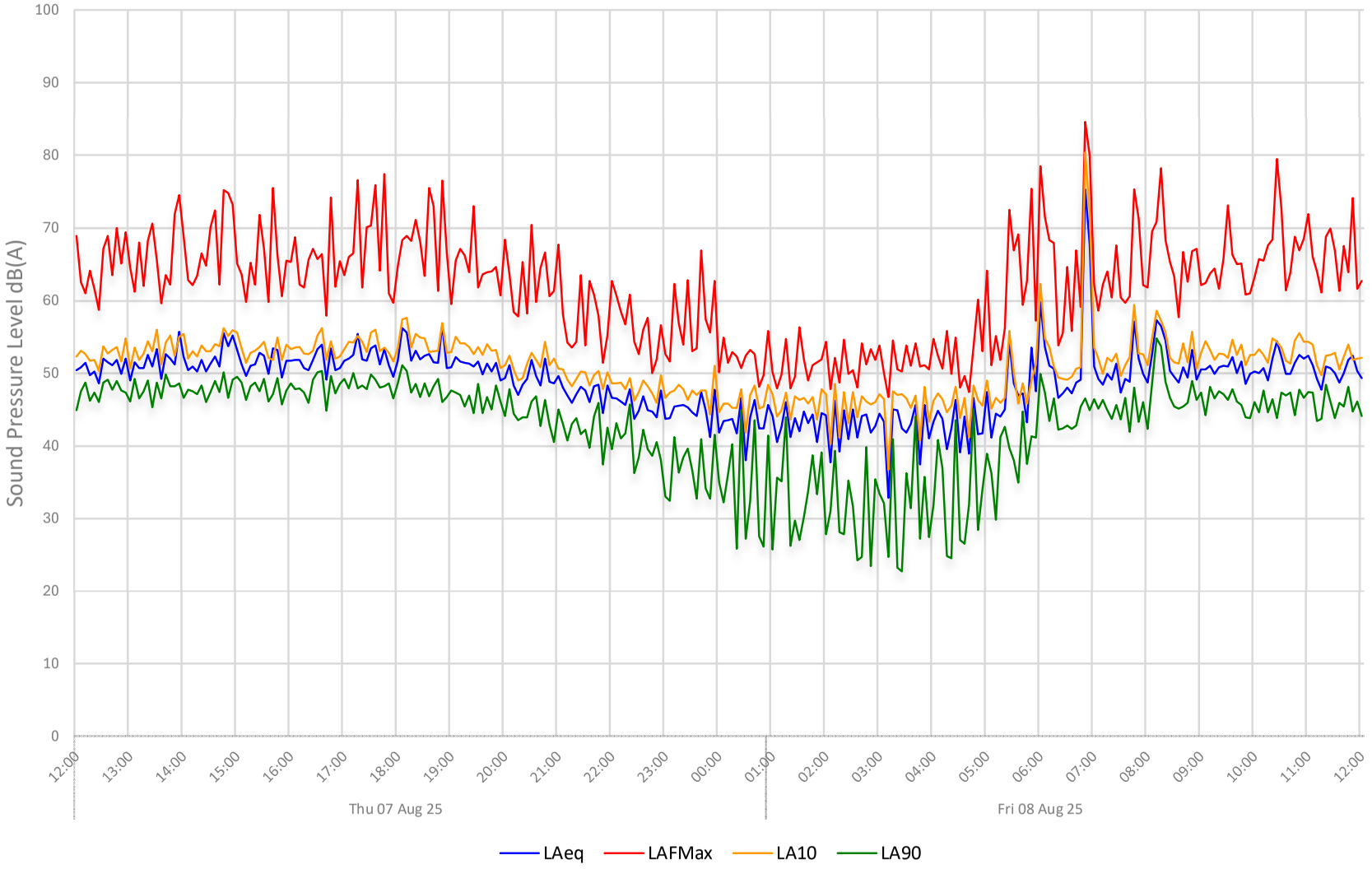
1-2 Dems House, Storrington

Environmental Noise Time History: 2

Front

VENTA ACOUSTICS

Figure VA6030/TH2



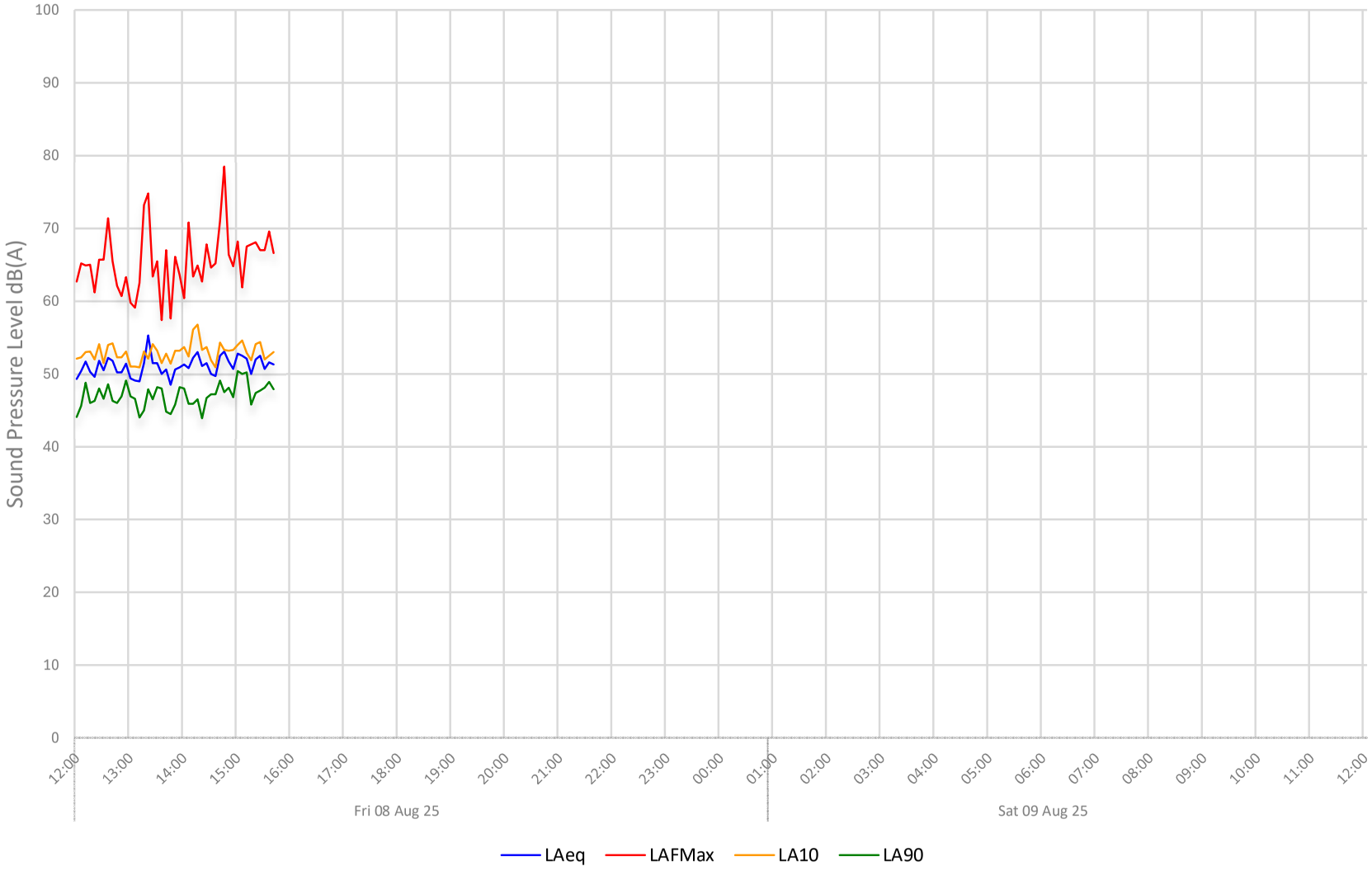
1-2 Dems House, Storrington

Environmental Noise Time History: 3

Front

VENTA ACOUSTICS

Figure VA6030/TH3



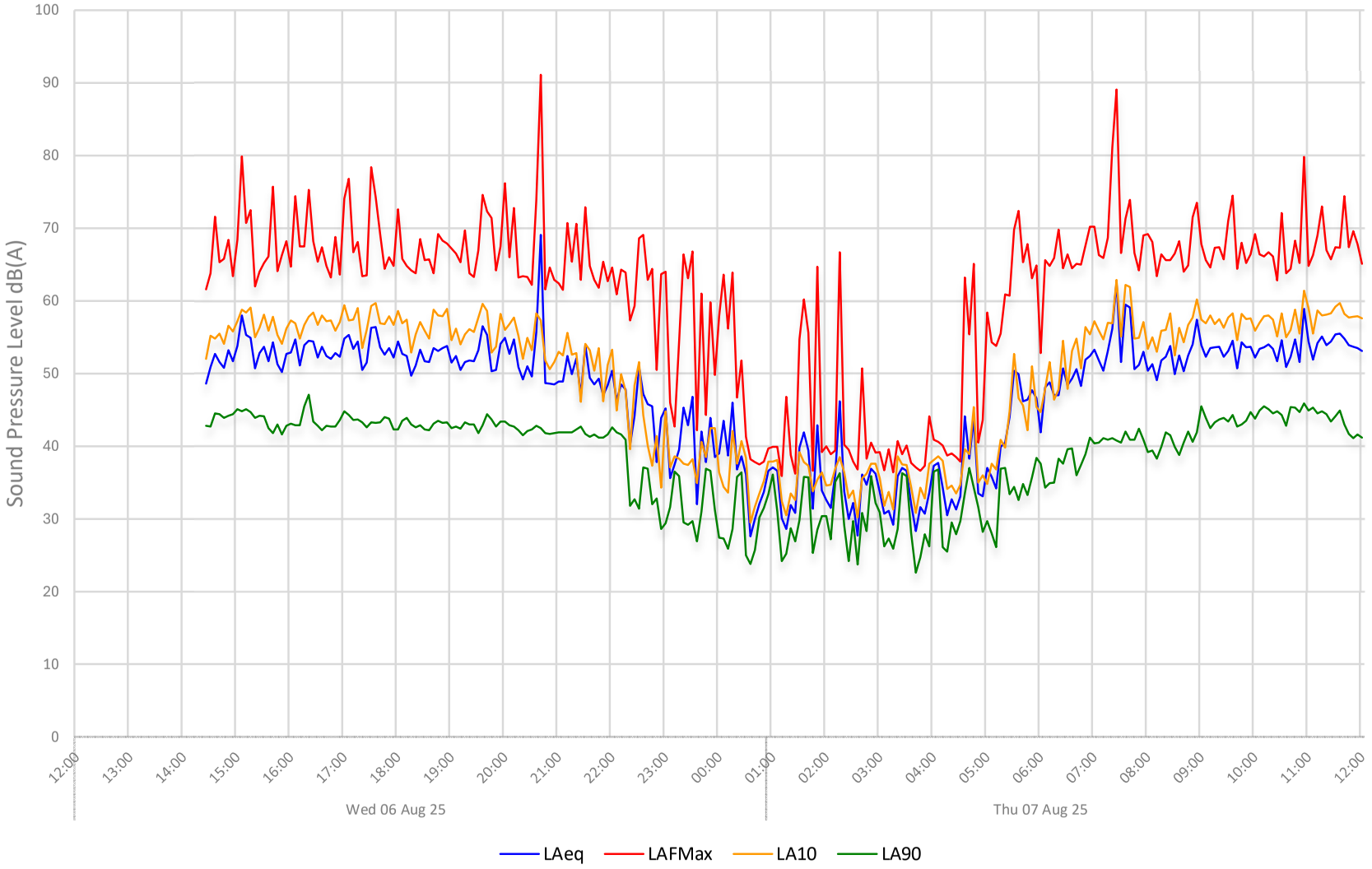
1-2 Dems House, Storrington

Environmental Noise Time History: 7

Rear

VENTA ACOUSTICS

Figure VA6030/TH7



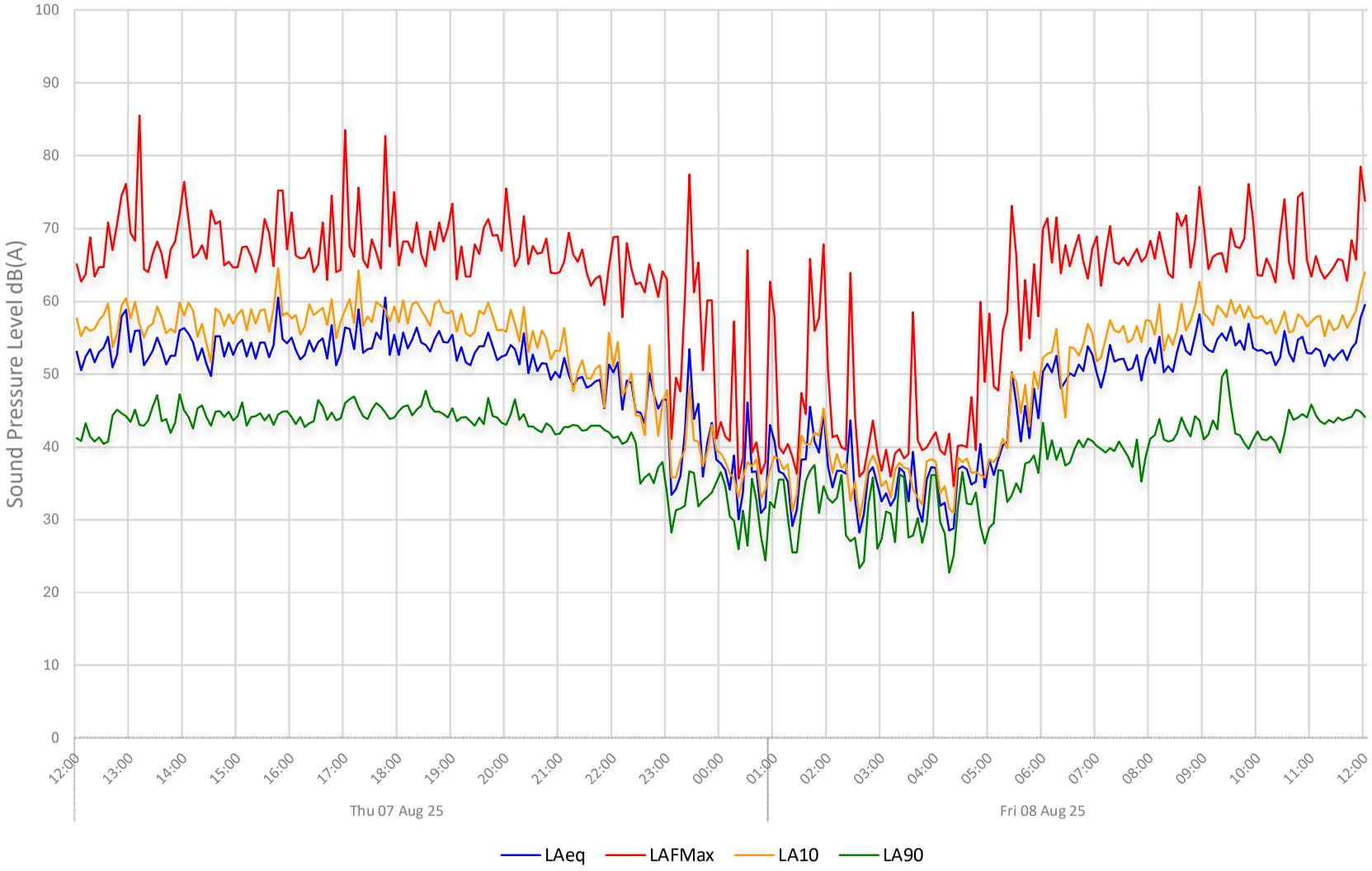
1-2 Dems House, Storrington

Environmental Noise Time History: 8

Rear

VENTA ACOUSTICS

Figure VA6030/TH8



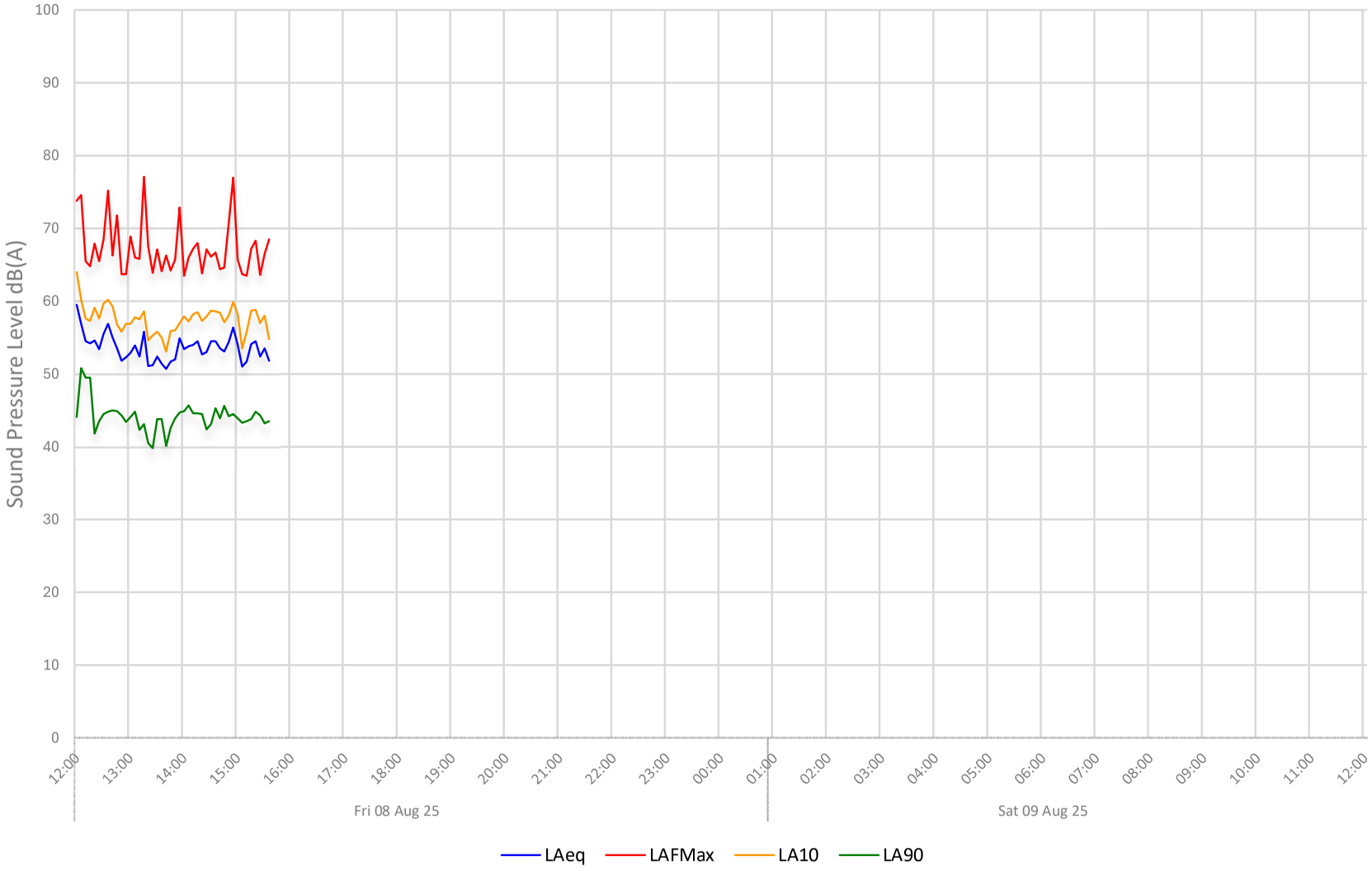
1-2 Dems House, Storrington

Environmental Noise Time History: 9

Rear

VENTA ACOUSTICS

Figure VA6030/TH9



# Airborne Sound Insulation Test

**Figure : VA6030/AB1**

## Standardised level difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

(NB Higher $D_{nT,w} + C_{tr}$ figures denote better sound insulation performance)

Construction Tested:

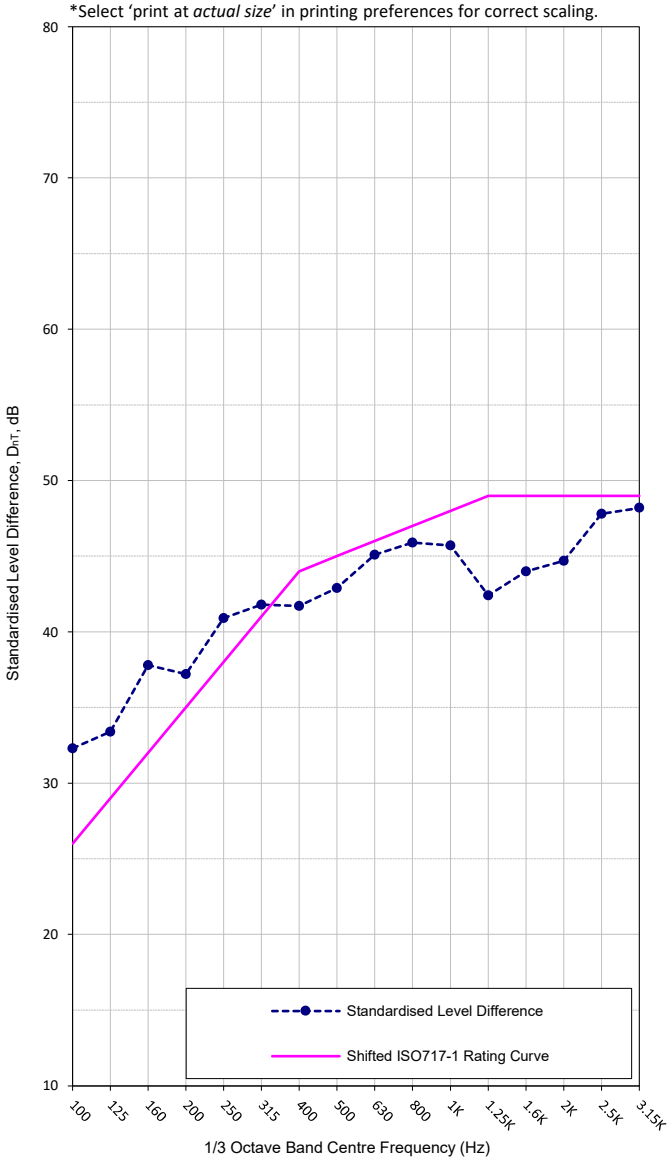
Type

Rooms Tested From : ***Ground Floor***

To : ***First Floor***

| Frequency Hz | $D_{nT}$ dB |
|---|---|
| 100 | 32.3 |
| 125 | 33.4 |
| 160 | 37.8 |
| 200 | 37.2 |
| 250 | 40.9 |
| 315 | 41.8 |
| 400 | 41.7 |
| 500 | 42.9 |
| 630 | 45.1 |
| 800 | 45.9 |
| 1k | 45.7 |
| 1.25k | 42.4 |
| 1.6k | 44.0 |
| 2k | 44.7 |
| 2.5k | 47.8 |
| 3.15k | 48.2 |

*Select 'print at *actual size*' in printing preferences for correct scaling.




| | |
|---|---|
| Shift Curve By: | -7 dB |
| Sum of Adverse Deviations = | 26.6 dB |
| $C_{tr}$ = | -2 dB |
| $D_{nT,w}$ = | 45 dB |

**$D_{nT,w} + C_{tr}$ = 43 dB**

*Evaluation based on field measurement results obtained in one-third octave bands by an engineering method.*

Test Standard: *BS EN ISO 140-4*

Rating Standard: *BS EN ISO 717-1*

Test Date: *06/08/2025*

VA Project Number: *VA6030*

VENTA ACOUSTICS

Client: *Hancoda Ltd*

Site: *1-2 Dems House, Storrington*

# APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

## A. Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

| | |
|---|---|
| **Sound** | Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system. |
| **Noise** | Sound that is unwanted by or disturbing to the perceiver. |
| **Frequency** | The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'. |
| **dB(A):** | Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or LA. |
| **$L_{eq}$ :** | A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc).<br><br>The concept of Leq (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction.<br><br>Because Leq is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit. |
| **$L_{10}$ & $L_{90}$ :** | Statistical Ln indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L10 is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L90 is the typical minimum level and is often used to describe background noise.<br><br>It is common practice to use the L10 index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow. |
| **$L_{max}$ :** | The maximum sound pressure level recorded over a given period. Lmax is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged Leq value. |
| **R** | Sound Reduction Index. Effectively the Level Difference of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room. |
| **D** | The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. D is the arithmetic Level |

# APPENDIX A

Acoustic Terminology & Human Response to Broadband Sound

| | |
|---|---|
| | Difference in decibels between the source and receive sound levels when filtered into frequency bands. |
| $D_{nT}$ | Weighted Standardised Level Difference. As defined in BS EN ISO 717-1, representing the Weighted Level Difference, when standardised for reference receiving room reverberant characteristics. |
| $D_{n,e}$ | Normalised sound insulation of small building elements of fixed dimensions, such as vents, measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010. |
| $D_{n,f}$ | Flanking sound insulation of lightweight elements, such as curtain wall mullions, measured in an accredited laboratory test suite in accordance with the procedures laid down in ISO 10848-2:2006 |
| $R_w$ $D_w$ $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$ | Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure value. |
| **C, $C_{tr}$** | Spectral adaptation terms to be added to a single number quantity such as DnT,w, to take account of the sound insulation within frequency ranges of particular interest. |
| $L'_{nT,w}$ | Weighted Standardised Impact Sound Pressure Level as defined in BS EN ISO 717-2, representing the level of sound pressure when measured within a space where the floor above is under excitation from a calibrated tapping machine, standardised for the receiving room reverberant characteristics. |
| $\Delta L_w$ | Change in impact sound pressure level when a floor is fitted with a 'soft' or resilient covering, as measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-3:2010. |

## B. Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

| Octave Band Centre Frequency Hz | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|---|---|---|---|---|---|---|---|---|

## C. Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB

is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

| Change in Sound Level dB | Subjective Impression | Human Response |
|---|---|---|
| 0 to 2 | Imperceptible change in loudness | Marginal |
| 3 to 5 | Perceptible change in loudness | Noticeable |
| 6 to 10 | Up to a doubling or halving of loudness | Significant |
| 11 to 15 | More than a doubling or halving of loudness | Substantial |
| 16 to 20 | Up to a quadrupling or quartering of loudness | Substantial |
| 21 or more | More than a quadrupling or quartering of loudness | Very Substantial |

## D. Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.