Report VA5005.231120.NIA

Unit 1, Harland House, 44 Commercial Way, Woking

Noise Impact Assessment

21 November 2023

Yousaf Hassan

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Contents

Attachments

Report Version	Author	Approved	Changes	Date
NIA1	Steven Liddell	Ben Alexander	-	20/11/23

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 Unit 1, Harland House, 44 Commercial Way, Woking from commercial to residential use under Class MA of the General Permitted Development Order.

Venta Acoustics has been commissioned by Yousaf Hassan 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 and the planning requirements of Woking City Council.

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 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 (2023)

The revised *National Planning Policy Framework* (NPPF), published in September 2023, 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 185 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 attached site plan VA5005/SP1, the site is a mid-terrace building with retail use at ground floor level and new flats to be developed at first floor level.

The site is in an urban location on a limited access road, with cafes and restaurants on Commercial Road to the front and a small car park to the rear. Several of the neighbouring properties have residential use at first floor level.

Noise levels in the area are modest, controlled by traffic on surrounding roads. There is limited commercial noise at the front of the property. At the rear, the noise levels are affected by building services on the surrounding buildings.

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 Monday 13th and Wednesday 15th November 2023 at first floor level at the locations shown in site plan VA5005/SP1. These locations were chosen to be representative of the noise levels at the site.

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-15993-E0	1504971-2	28/3/23
NTi Class 1 Integrating SLM	XL2	A2A-15892-E0	150497-1	28/3/23
Larson Davis calibrator	CAL200	13049	1504971-3	28/3/23

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 VA5005/TH1-2 for position 1 at the front of the building and VA5005/TH3-4 for position 2 at the rear of the building.

The site is primarily affected by traffic noise at the front of the building and sound from surrounding building services plant at the rear.

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] $L_{A90,5min}$	
	Front	Rear	Front	Rear
07:00 – 23:00	60 dB	49 dB	61 dB	54 dB
23:00 – 07:00	62 dB	41 dB	55 dB	49 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.

The typical night time L_{Amax} events were recorded to be in the order of 74dB $L_{Amax,fast}$ at the front of the building and $L_{Amax,fast}$ 71dB at the rear of the building.

5. BS4142 Noise Impact Assessment

5.1 Source Noise Levels

Observations on site confirmed that noise from plant at the rear of the building is the primary commercial noise source affecting the building. At the front there are cafes and retail units, none of which were considered to generate significant noise. By controlling for traffic noise, these low level sound sources at the front of the building would be well managed.

Noise levels from building services plant was measured to be 57dB at the rear of the building.

Noise Source	Measurement Distance	Measured L_{Aeq}	Notes
Building Services Noise	At Building Façade	57dB	Drops to 50dB after midnight

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
Building Services	Not tonal or impulsive but of recognisable character	Other Characteristics: +3dB

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.

Table 5.3 shows the assessment for the unloading on the most affected façade of the new dwellings.

Results		Relevant Clause	Commentary
Specific Sound Level	L_{Aeq} 57dB		
Façade Correction	-3dB	7.2	Measured within 1m of the building façade
Acoustic feature correction	+3dB	9.2	+3dB for distinctive sound character
Rating level	L_{Ar} 57 dB	9.2	
Nighttime background sound level	L_{A90} 49 dB	8	
Excess of rating over background sound level	+8 dB	11	
Assessment indicates adverse impact prior to mitigation		11	Depending on context

Table 5.3 – BS4142 Assessment

5.4 Context

The site is located in a mixed use area with limited traffic and modest noise levels. The plant noise at the rear of the site is expected in this type of locality and can be readily controlled with modest glazing to the rear elevation (see Section 6.1.2).

Within this context, and with mitigation entirely viable, the impact of the sound sources is expected to be low.

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 a Class 1 sound level meter 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 background noise levels,. Two monitoring locations were selected to minimise local acoustic phenomenon that may affect a single measurement location. These measurement locations were selected to be representative of the background noise levels expected to be experienced by the proposed dwellings without being unduly influenced by extraneous noise sources.
- The plant noise is expected to be consistent from day to day with no other commercial noise sources expected to affect the development in a significant way.
- Source data was measured on site at the receiver. 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.

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 sound from the commercial uses, the sound insulation performance of the building glazing will be specified to control the Rating noise level (including BS4142 penalties) to below the recommended values in BS8233. This hybrid approach of assessing commercial noise with a BS4142 penalty against the BS8233 criteria (over a shortened assessment period) is endorsed in the ProPG (Professional Practice Guidance on Planning and Noise prepared by the Institute of Acoustics, the Chartered Institute of Environmental Health and the Association of Noise Consultants).

Although Class MA of the GPDO only considers commercial noise impacts, the following includes the glazing requirement to control external noise levels, including traffic, to BS8233 levels internally as an informative.

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
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
Front Façade	R_w 27	$D_{n,e,w}$ 35
Rear Façade	R_w 27	$D_{n,e,w}$ 35

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

These performances are expected to be achieved with standard thermal double glazing and standard trickle vents.

In order that windows may remain closed to maintain the internal noise levels, it is expected that attenuated means of background ventilation will be required. If 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

It is important that the performance shown in Table 6.2 are 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.

Passive ventilators alone may not provide sufficient air flow for summer overheating, which should be evaluated by a suitably qualified thermal engineer.

6.2 Resulting Internal Sound Levels

With the above recommendations implemented, the noise levels within the proposed dwellings would be expected to be in line with recommendations given in the WHO 1999 and BS8233:2014 guidance. Internal noise levels can therefore be considered to be between the NOEL the LOAEL levels.

A low impact is expected within the dwellings on this basis.

7. Sound Insulation to Commercial Uses

The sound insulation of the existing floor separating the ground floor unit and first floor was measured during a site visit on 13th November 2023.

Tests were undertaken in general accordance with the procedures defined in BS EN ISO 16283-1:2014 *Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation* using a pair of uncorrelated pink noise sources.

The tests results are shown in Table 7.2 and are weighted as per the methodology described in BS EN ISO 717-1: 2013 *Acoustics – Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation* to provide a single figure performance value.

The following equipment was used during the testing:

Manufacturer	Model Type	Serial No	Calibration	
			Certificate No.	Date
NTi Class 1 Integrating SLM	XL2	A2A-15892-E0	150497-1	28/3/23
Larson Davis calibrator	CAL200	13049	1504971-3	28/3/23
Electro Voice	ZLX-12P-EX	095208361761760076	-	-
Electro Voice	ZLX-12P-EX	095208361761760087	-	-
2 No. Unbranded WAV player	-	-	-	-

Table 7.1 – Equipment used for the tests

The spectral test results are presented in VA5005/AB1-2, attached.

Source	Receive	Sound Insulation, $D_{nt} + C_{tr}$
Ground Floor Unit	First Floor Unit – Bedroom	43 dB
Ground Floor Unit	First Floor Unit – Living Room	45 dB

Table 7.2 – Airborne sound insulation test result

The test result is indicative of a good level of sound insulation, meeting the requirements of Approved Document E for change of use. The sound insulation test to the bedroom was compromised by extraneous noise from building activities and a higher performance is anticipated in reality.

It is recommended that a ceiling is suspended below the soffit in the ground floor unit, forming a cavity of at least 250mm and consisting of 2 layers of 15mm dense plasterboard such as SoundBloc or similar (minimum mass 11kg/m^2 per board), joints staggered and skimmed. This is expected to provide a 5-10dB improvement at mid to high frequencies and a good level of protection to the residents above.

The store below is expected to be standard Class E retail uses with moderate internal noise. With the example of a lively restaurant or coffee shop, internal levels are expected to reach L_{Aeq} 75dB. This would result in a noise level of below L_{Aeq} 20dB in the space above (with the above mitigation

measures in place). This is not expected to cause an adverse impact and the sound insulation would be expected to be sufficient for the residential/commercial adjacency.

These assumed noise levels are the upper limit of what would reasonably be expected in a retail store. Should a store with higher noise levels occupy one of the commercial units in the future, it would generally be expected that the tenant would take appropriate steps during the fit-out of the space to control the noise impact.

8. Conclusion

A baseline noise survey has been undertaken by Venta Acoustics to establish the prevailing noise climate in the locality of Unit 1, Harland House, 44 Commercial Way, Woking in support of a prior approval application for the proposed conversion of first floor into residential dwellings.

The measured levels have been assessed against the National Planning Policy Framework and currently available standards and guidance documents including World Health Organisation *Guidelines for Community Noise* (1999) and BS8233:2014 *Guidance on sound Insulation and noise*.

When assessed using BS4142, noise from mechanical plant at the rear of the site has been shown to have a low impact, where suitably mitigated through appropriate specification of the external building fabric.

Although not required under a class MA application, for advisory purposes appropriate external and internal noise criteria have been considered to minimise adverse impacts on health and quality of life as a result of the new development. Appropriate mitigation measures have been outlined including proprietary thermal double-glazing and trickle vents.

The sound insulation between the ground and first-floor areas has been measured and, while already providing a good level of acoustic separation, recommendations to enhance the performance have been provided. The upper limits of noise expected from reasonable retail use at ground floor level have been shown to have a low impact with these measures in place.

The proposed scheme is not expected to experience a significant adverse noise impact and the site is considered acceptable for the proposed residential use.

Steven Liddell MIOA


Noise monitoring position 1
Noise monitoring position 2

Unit 1, Harland House, 44 Commercial Way, Woking

Environmental Noise Time History: 1

Front

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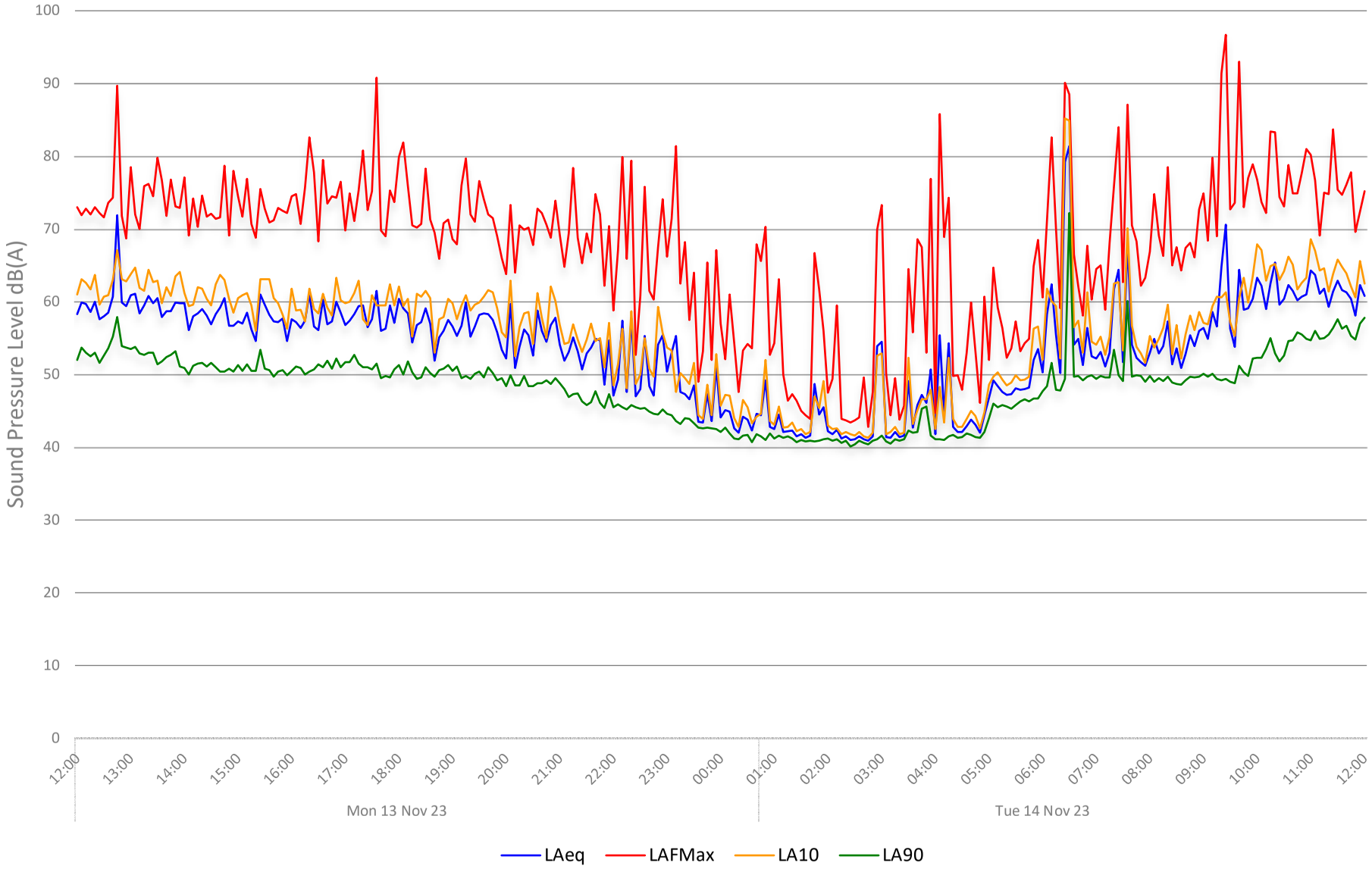
Figure VA5005/TH1



Unit 1, Harland House, 44 Commercial Way, Woking

Environmental Noise Time History: 2

Front

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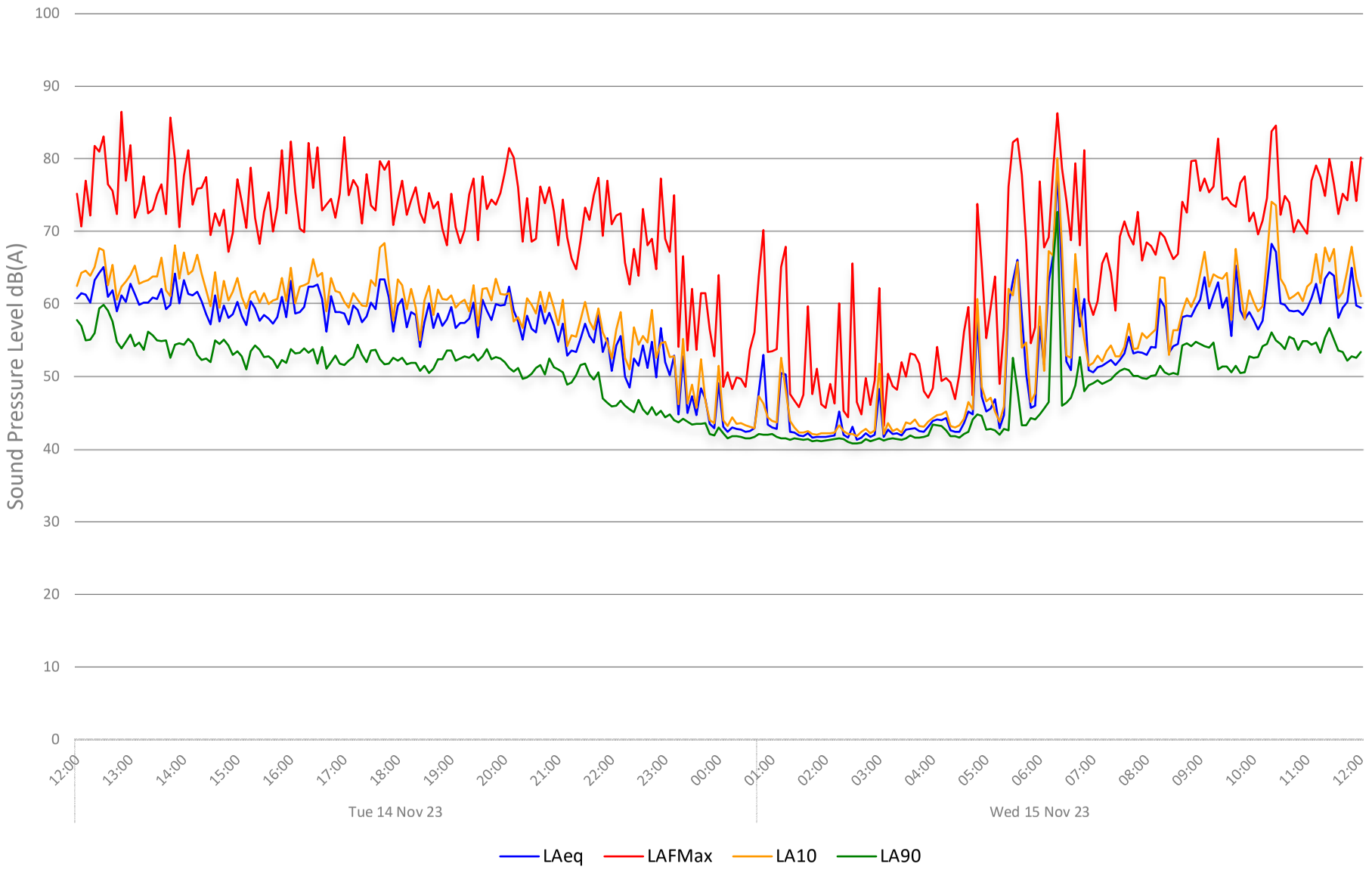
Figure VA5005/TH2



Unit 1, Harland House, 44 Commercial Way, Woking

Environmental Noise Time History: 3

Rear

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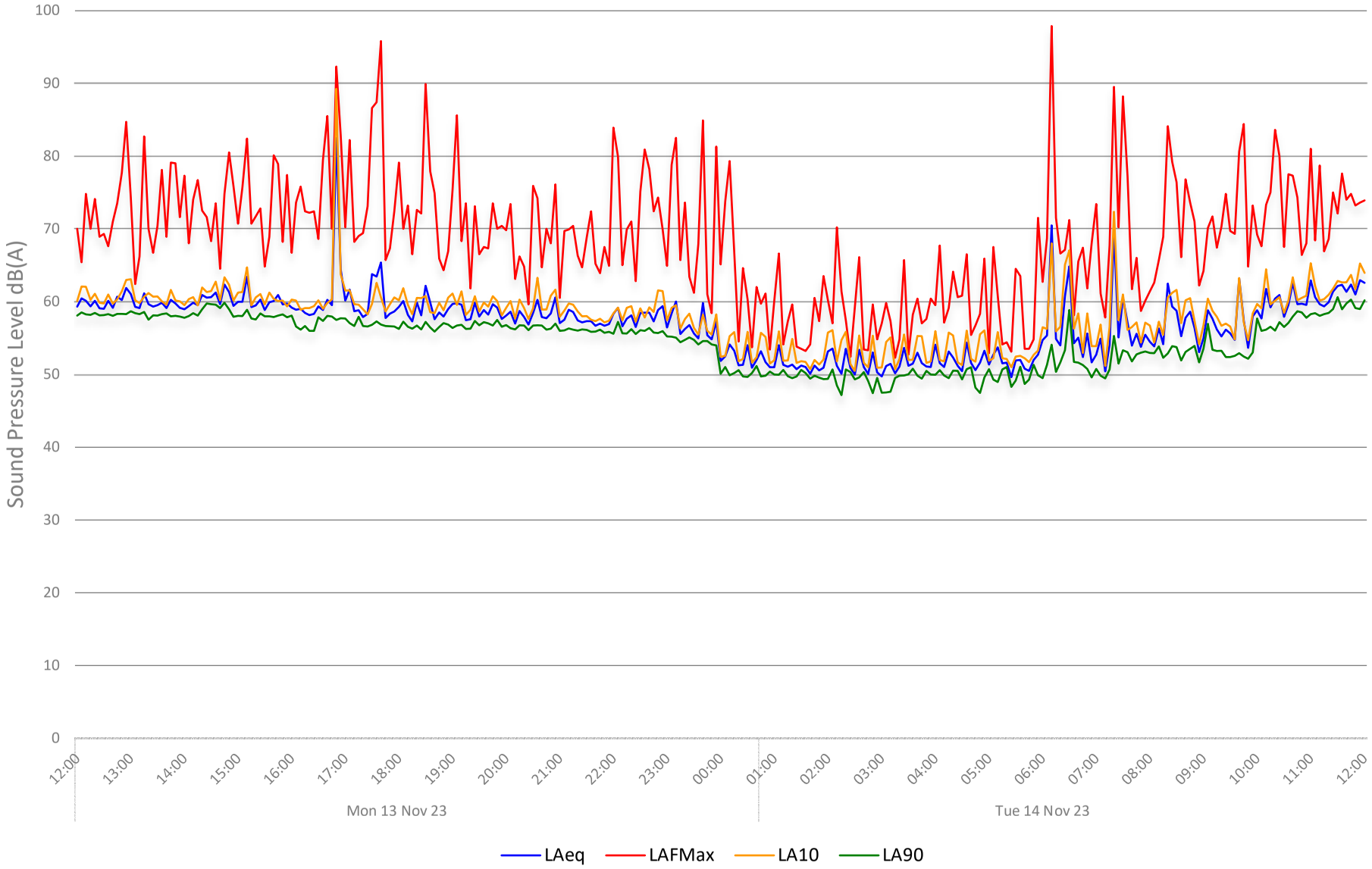
Figure VA5005/TH3



Unit 1, Harland House, 44 Commercial Way, Woking

Environmental Noise Time History: 4

Rear

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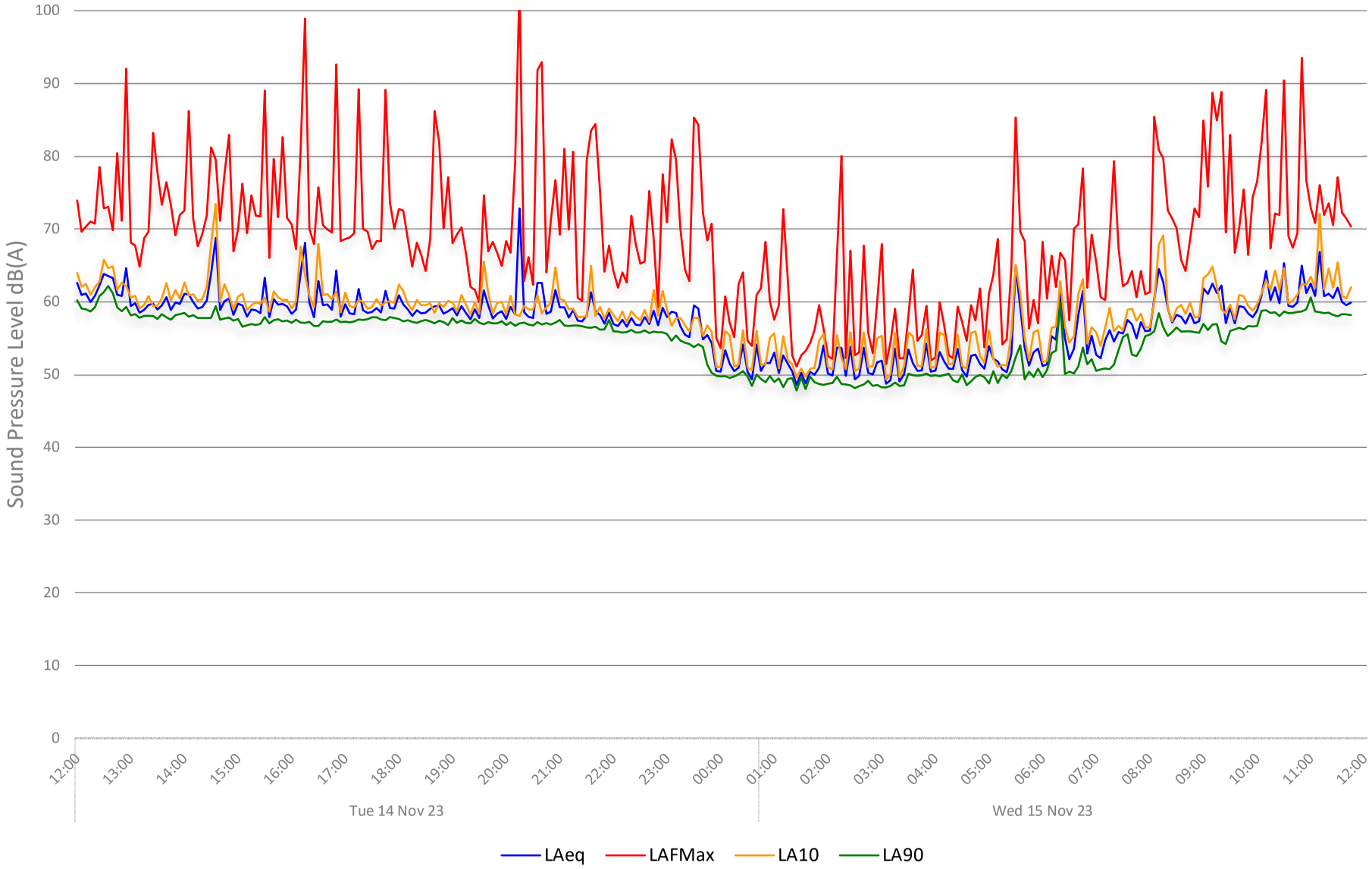
Figure VA5005/TH4



Airborne Sound Insulation Test

Figure : VA5005/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:

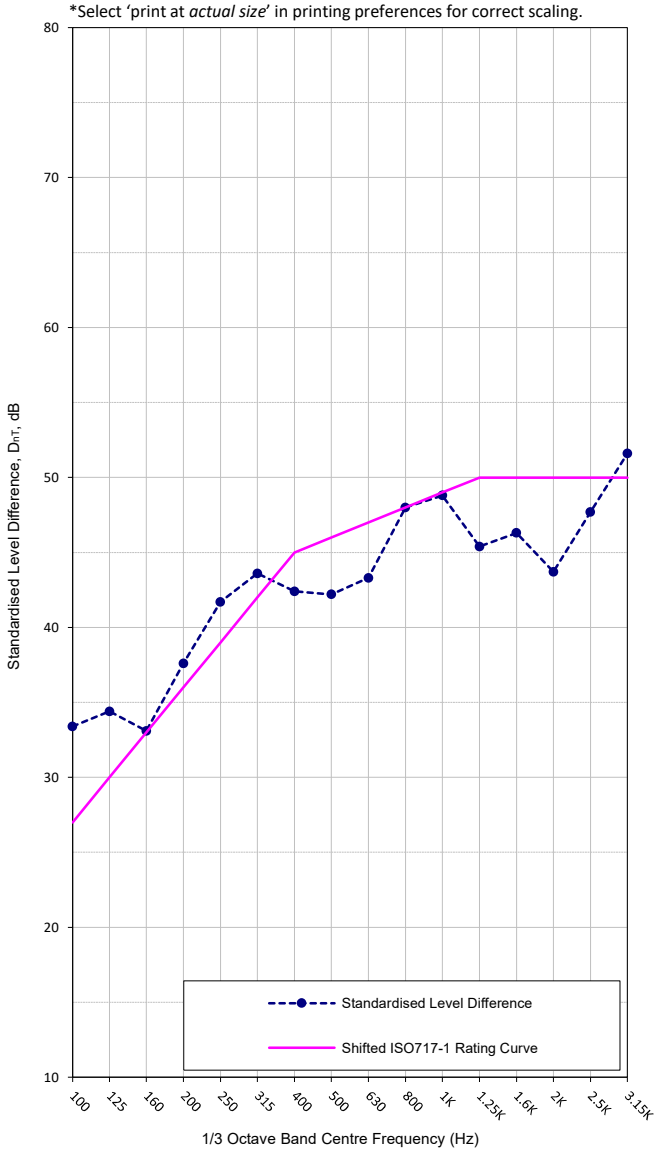
Type

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

To : ***First Floor Bedroom***

Frequency Hz	D_{nT} dB	
100	33.4	Limit of measurement, $D_{nT} \geq 33.4$
125	34.4	
160	33.1	
200	37.6	
250	41.7	
315	43.6	Limit of measurement, $D_{nT} \geq 43.6$
400	42.4	Limit of measurement, $D_{nT} \geq 42.4$
500	42.2	Limit of measurement, $D_{nT} \geq 42.2$
630	43.3	Limit of measurement, $D_{nT} \geq 43.3$
800	48.0	Limit of measurement, $D_{nT} \geq 48.0$
1k	48.8	Limit of measurement, $D_{nT} \geq 48.8$
1.25k	45.4	Limit of measurement, $D_{nT} \geq 45.4$
1.6k	46.3	Limit of measurement, $D_{nT} \geq 46.3$
2k	43.7	Limit of measurement, $D_{nT} \geq 43.7$
2.5k	47.7	Limit of measurement, $D_{nT} \geq 47.7$
3.15k	51.6	Limit of measurement, $D_{nT} \geq 51.6$

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



Shift Curve By:	-6 dB
Sum of Adverse Deviations =	27.2 dB
C_{tr} =	-3 dB
$D_{nT,w}$ =	46 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: *13/11/2023*

VA Project Number: *VA5005*

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Client: *Yousaf Hassan*

Site: *Unit 1, Harland House, 44 Commercial Way, Woking*

Airborne Sound Insulation Test

Figure : VA5005/AB2

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

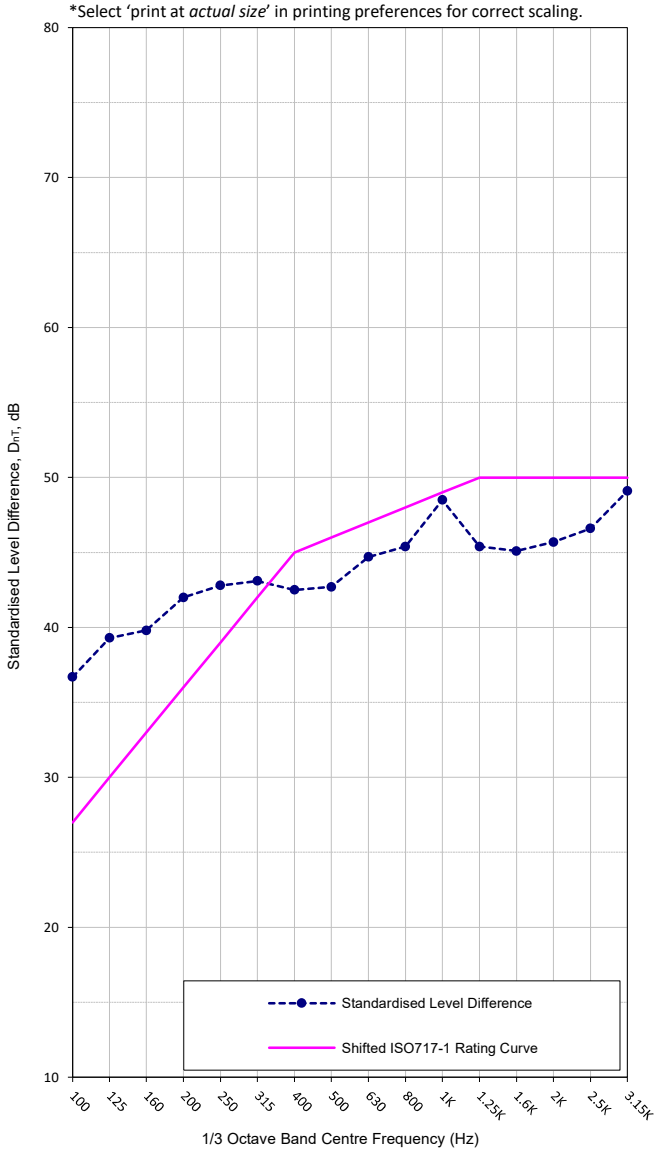
Rooms Tested From : ***Ground Floor***

To : ***First Floor Living Room***

Frequency Hz	D_{nT} dB
100	36.7
125	39.3
160	39.8
200	42.0
250	42.8
315	43.1
400	42.5
500	42.7
630	44.7
800	45.4
1k	48.5
1.25k	45.4
1.6k	45.1
2k	45.7
2.5k	46.6
3.15k	49.1

Limit of measurement, $D_{nT} \geq 45.7$

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



Shift Curve By:	-6 dB
Sum of Adverse Deviations =	29.3 dB
C_{tr} =	-1 dB
$D_{nT,w}$ =	46 dB

$D_{nT,w} + C_{tr}$ = 45 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: *13/11/2023*

VA Project Number: *VA5005*

VENTA ACOUSTICS

Client: *Yousaf Hassan*

Site: *Unit 1, Harland House, 44 Commercial Way, Woking*

Airborne Sound Insulation Test

Figure : VA5005/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:

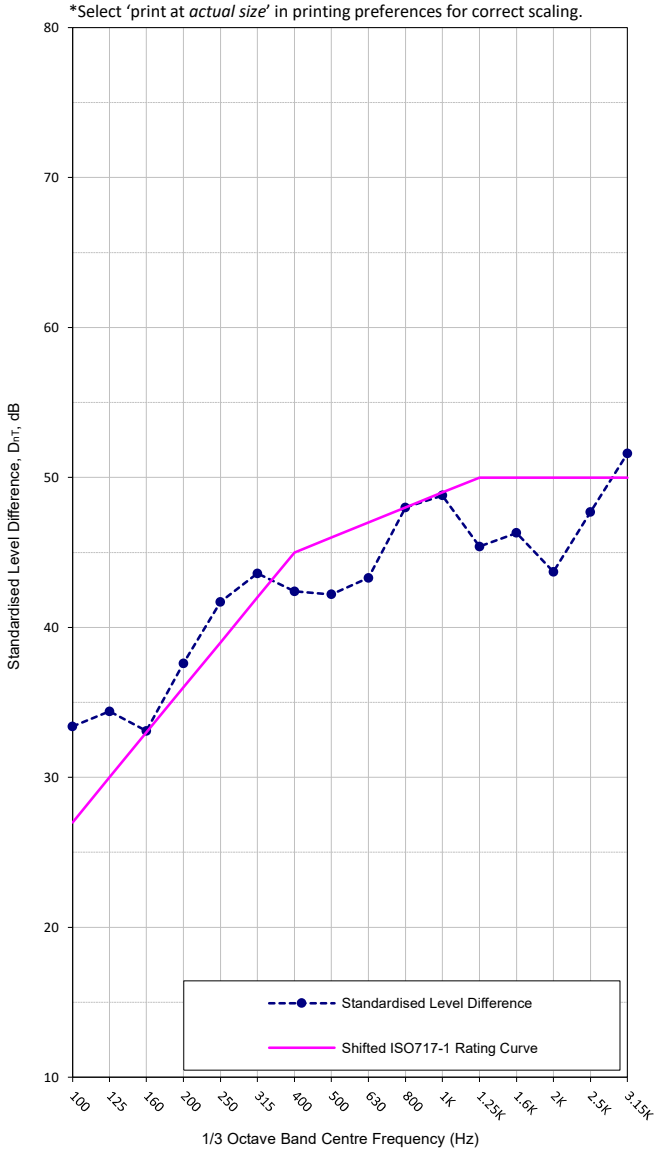
Type

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

To : ***First Floor Bedroom***

Frequency Hz	D_{nT} dB	
100	33.4	Limit of measurement, $D_{nT} \geq 33.4$
125	34.4	
160	33.1	
200	37.6	
250	41.7	
315	43.6	Limit of measurement, $D_{nT} \geq 43.6$
400	42.4	Limit of measurement, $D_{nT} \geq 42.4$
500	42.2	Limit of measurement, $D_{nT} \geq 42.2$
630	43.3	Limit of measurement, $D_{nT} \geq 43.3$
800	48.0	Limit of measurement, $D_{nT} \geq 48.0$
1k	48.8	Limit of measurement, $D_{nT} \geq 48.8$
1.25k	45.4	Limit of measurement, $D_{nT} \geq 45.4$
1.6k	46.3	Limit of measurement, $D_{nT} \geq 46.3$
2k	43.7	Limit of measurement, $D_{nT} \geq 43.7$
2.5k	47.7	Limit of measurement, $D_{nT} \geq 47.7$
3.15k	51.6	Limit of measurement, $D_{nT} \geq 51.6$

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



Shift Curve By:	-6 dB
Sum of Adverse Deviations =	27.2 dB
C_{tr} =	-3 dB
$D_{nT,w}$ =	46 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: *13/11/2023*

VA Project Number: *VA5005*

VENTA ACOUSTICS

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Site: *Unit 1, Harland House, 44 Commercial Way, Woking*