

# J O S T E C

BUILDING REGULATIONS COMPLIANCE SERVICES



REPORT TITLE: NOISE SURVEY REPORT INCLUDING ASSESSMENT OF  
SCHEME OF NOISE INSULATION MEASURES FOR  
RESIDENTIAL DEVELOPMENT AT  
82 LONDON ROAD, ENFIELD EN2 6HU

REPORT REFERENCE: 2368503

ISSUED TO: DAWN PHANTIS  
82 LONDON ROAD  
ENFIELD EN2 6HU

ISSUED BY: MATT HINE

DATE: 11 October 2023

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## SUMMARY

- A noise survey and assessment has been carried out by JosTec for a residential development at 78-80 London Road, Enfield EN2 6HU. This report is to be submitted for the same works to be carried out at 82 London Road, Enfield EN2 6HU.
- The noise assessment is to be submitted to London Borough of Enfield to assist a permitted development application.
- Day and night period noise to the development site includes contributions from road and pedestrian traffic.
- The development site is exposed to moderate overall noise levels throughout the day and night periods.
- Using results of a noise survey at the development site, a scheme of noise insulation measures is established to ensure that noise levels to inside rooms of the new dwelling comply with criteria set with reference to British Standard BS 8233:2014 *"Guidance on Sound Insulation and Noise Reduction for Buildings"*.
- Details of the noise survey, assessment and scheme of noise insulation measures are included in the report, verified by composite sound reduction indices calculation of the overall residential building envelope.

## 1. INTRODUCTION

JosTec has been commissioned to undertake a noise survey and assessment for a proposed residential conversion development at 82 London Road, Enfield EN2 6HU.

A scheme of noise insulation measures for the development including acoustic performance for glazing and ventilation is proposed to protect future residents of the development from external noise. This report presents results of a noise survey and assessment of the scheme and includes:

- Description of the development;
- Review of noise criteria;
- Details of noise survey including subjective observations;
- Noise survey assessment;
- Assessment of scheme of noise insulation measures.

## 2. DEVELOPMENT DESCRIPTION

The development site is located at 82 London Road, Enfield EN2 6HU, facing on to a short section of A105 London Road that includes a small selection of terraced retail and local businesses at ground floor level with residential accommodation on upper floors.

The proposed development comprises conversion of the existing previously commercial use ground floor to provide two residential studio apartments. Site location plan, aerial image and drawings of the proposed development are included in Appendix A.

Overall noise levels to the site are moderate and typical of this type of semi-suburban location. They comprise principally of contributions from road traffic along adjacent A105 London Road and surrounding streets. Further details on noise levels and sources are provided in Section 4.3.

### 3. NOISE CRITERIA

Similar developments in London Borough of Enfield and other local authorities have approved and employed the methodology and guideline noise levels given in BS 8233:2014 "Guidance on Sound Insulation and Noise Reduction for Buildings" ("BS 8233"). BS 8233 is considered appropriate for use in this assessment and report.

Guidance in BS8233:2014 Section 7.7.2 *Internal ambient noise levels for dwellings* Table 4 advises it is desirable that ambient noise levels to inside residential dwellings do not exceed the guideline values shown below in Table 1 :

Activity	Location	07:00 to 23:00 (day period)	23:00 to 07:00 (night period)
Resting	Living room	≤35dB $L_{Aeq,1hour}$	-
Dining	Dining room/area	≤40dB $L_{Aeq,1hour}$	-
Sleeping (daytime resting)	Bedroom	≤35dB $L_{Aeq,1hour}$	≤30dB $L_{Aeq,8hour}$

**Table 1:** Indoor ambient noise levels for dwellings

Note 4 to Table 4 in Section 7.7.2 of BS8233:2014 additionally advises that regular individual noise events can cause sleep disturbance and that a guideline value may be set in terms of SEL or  $L_{A_{fmax}}$  depending on the character and number of events per night. Although this guidance relates principally to night period noise from aircraft and trains, it is nevertheless considered appropriate to apply an  $L_{A_{fmax}}$  criterion for bedrooms during the night period for this development.

BS8233:2014 does not however provide any specific numerical guidance on night period  $L_{A_{fmax}}$  values for noise into bedrooms - the previous  $L_{A_{fmax}}$  limit guidance for bedrooms in BS8233:1999 is removed from BS8233:2014. Notwithstanding this, and in keeping with World Health Organisation Noise Guideline Values, the noise assessment in this report includes the BS8233:1999 criterion of  $L_{A_{fmax}}$  45dB for bedrooms during the night period.

The  $L_{A_{fmax}}$  criterion is applied on the basis that individual and typical noise events should not regularly exceed  $L_{A_{fmax}}$  45dB, it is not intended that the requirement be applicable to infrequent night period very high noise level events such as the sirens of passing emergency vehicles.

## 4. NOISE SURVEY & ASSESSMENT

In order to assess the scheme for noise insulation measures proposed for the development it is necessary to determine day and night period noise levels at representative positions. Details of the noise survey carried out by JosTec are provided in the following sections.

### 4.1 Noise Survey Details & Procedure

A noise survey has been carried out at the development site using a logging type sound level meter from Thursday 10<sup>th</sup> March 2022 to Friday 11<sup>th</sup> March 2022. The weather included mostly dry and calm/light wind conditions during the day and also the night periods of the survey.

A primary long term unattended noise survey measurement location was selected on the front façade of the development site overlooking A105 London Road. This location was chosen to record potentially highest incident noise levels from passing road/pedestrian traffic on adjacent A105 London Road and surrounding streets.

The position was achieved by arranging measurement equipment on a tripod/pole arrangement externally at a height of c.3m above ground level and at 1m from the façade of the building to provide 1m façade levels. Measurements were recorded in terms of continuous 5 minute samples of principally broadband  $L_{Aeq}$  and  $L_{Amax}$  values together with octave band  $L_{Zeq}$  values over the duration of the survey.

Measurements were recorded in terms of continuous 5 minute samples of principally broadband  $L_{Aeq}$  and  $L_{Amax}$  values together with octave band  $L_{Zeq}$  values over the duration of the survey.

Long-term noise survey location is indicated on the site location plan in Appendix A.

### 4.2 Noise Survey Instrumentation

Details of the instrumentation used for the noise survey are provided in Appendix B. The sound level meter was calibrated before and after measurements using a certified calibrator.

### 4.3 Noise Survey Results & Observations

Noise levels to the development site comprise principally of contributions from passing road and pedestrian traffic on A105 London Road and distant road traffic on surrounding roads.

Noise levels rise steadily from early morning to midday where they remain at their highest until the late evening/night. Levels are at their lowest between approximately 02:00 and 06:00.

In accordance with normal acoustic measurement and assessment procedures, measured 1m façade noise survey levels are taken to be 3dB higher than levels measured away from buildings (i.e.: equivalent free-field values).

Complete raw results of the 24-hour noise survey in terms of  $L_{Aeq}$  and  $L_{Amax}$  values are provided in graphical format in Appendix C. Summary average day and night period equivalent free-field  $L_{Aeq}$  values plus typical highest-occurring night period equivalent free-field  $L_{Amax}$  value for the noise survey are shown in Table 2 below.

Day period $L_{Aeq, t}$ 07:00 - 23:00	Night period $L_{Aeq, t}$ 23:00 - 07:00	Night period $L_{Amax, t}$ 23:00 - 07:00
67.5dB	61.9dB	78.0dB

Table 2: Summary measured noise levels for day and night periods

### 4.4 Noise Survey Assessment

It can be seen from Table 2 that day and night period levels are moderate and the site is suitable for the proposed development providing that an appropriate specification of noise insulation is included within the scheme design to ensure compliance with the noise criteria set with reference to BS 8233:2014 as detailed in Section 3.

## 5. ASSESSMENT OF SCHEME FOR NOISE INSULATION MEASURES

For this development the scheme of noise insulation measures to protect against noise to inside the residential dwelling relates to the acoustic design and specification of elements of the building envelope which includes the external walls, glazing, ventilators and roof/ceiling structures.

The external walls and roof/ceiling structures to the development will by default provide a relatively high level of noise insulation and therefore as for most residential sites the dominant path for external noise to enter rooms will be via glazing, external doors and any ventilation system.

By following the rigorous calculation procedures outlined in Section G.2 of Annex G (informative) of British Standard BS 8233:2014 a specification for acoustic performance has been established and a scheme for noise insulation measures for the whole residential building envelope is assessed item by item in Sections 5.1 to 5.4 on the following pages.

Acoustic calculations are provided for day and night period noise intrusion into the proposed studio apartment at 82 London Road, selected as representing the worst case scenario room with the highest ratio of glazing to masonry and so with potentially highest incident noise levels. Copies of calculations are provided in Appendix D.

The calculations use a spreadsheet calculation based on Section G.2 of Annex G (informative) of British Standard BS 8233:2014 and BS EN 12354-3:2000, this form of spreadsheet is used by many acoustic consultancy practices.

The calculations confirm that with the proposed scheme for noise insulation measures implemented, intrusive noise levels into rooms of the development comply with BS 8233:2014 guideline values as detailed in Section 3, Table 1.



## 5.1 External Walls

External walls of the proposed building are understood to be traditional solid 9" brick:

Description	Octave Band Centre Frequency (Hz)					
	Sound Reduction Index <i>R</i> dB					
	125	250	500	1k	2k	4k
Traditional solid 9" brick	39	44	51	58	53	68

Table 2: External wall sound insulation performance

## 5.2 External Doors

Front doors to the proposed development are understood to be typical solid core wood type:

Description	Octave Band Centre Frequency (Hz)					
	Sound Reduction Index <i>R</i> dB					
	125	250	500	1k	2k	4k
Solid core wood door	19	22	26	24	23	20

Table 3: External door sound insulation performance

## 5.3 Glazing

Values in Table 4 below show a specification for double glazing sound insulation performance for all parts of the development.

Description	Octave Band Centre Frequency (Hz)					
	Sound Reduction Index <i>R</i> dB					
	125	250	500	1k	2k	4k
Acoustic performance 6-18-4 double glazing, $\geq R_w$ 34dB	20	23	32	36	38	40

Table 4: Glazing sound insulation performance

## 5.4 Ventilation

It is anticipated that a ventilation system will need to be incorporated into the scheme design such that residents of the property are able to have background ventilation without necessarily needing to open windows.

This is typically achieved through the use of passive type "trickle" ventilators in locations that are not subject to especially high noise levels. Specification for high acoustic performance type ventilators for all parts of the development is provided below in Table 5:

Description	Octave Band Centre Frequency (Hz)					
	Sound Reduction Index $D_{n,e}$ dB					
	125	250	500	1k	2k	4k
High acoustic performance trickle ventilator typically $\geq D_{n,e,w}$ 39dB	38	36	34	41	49	54

Table 5: Specification for ventilator sound insulation performance

APPENDIX A

Site Location Plan



Notes / Revisions



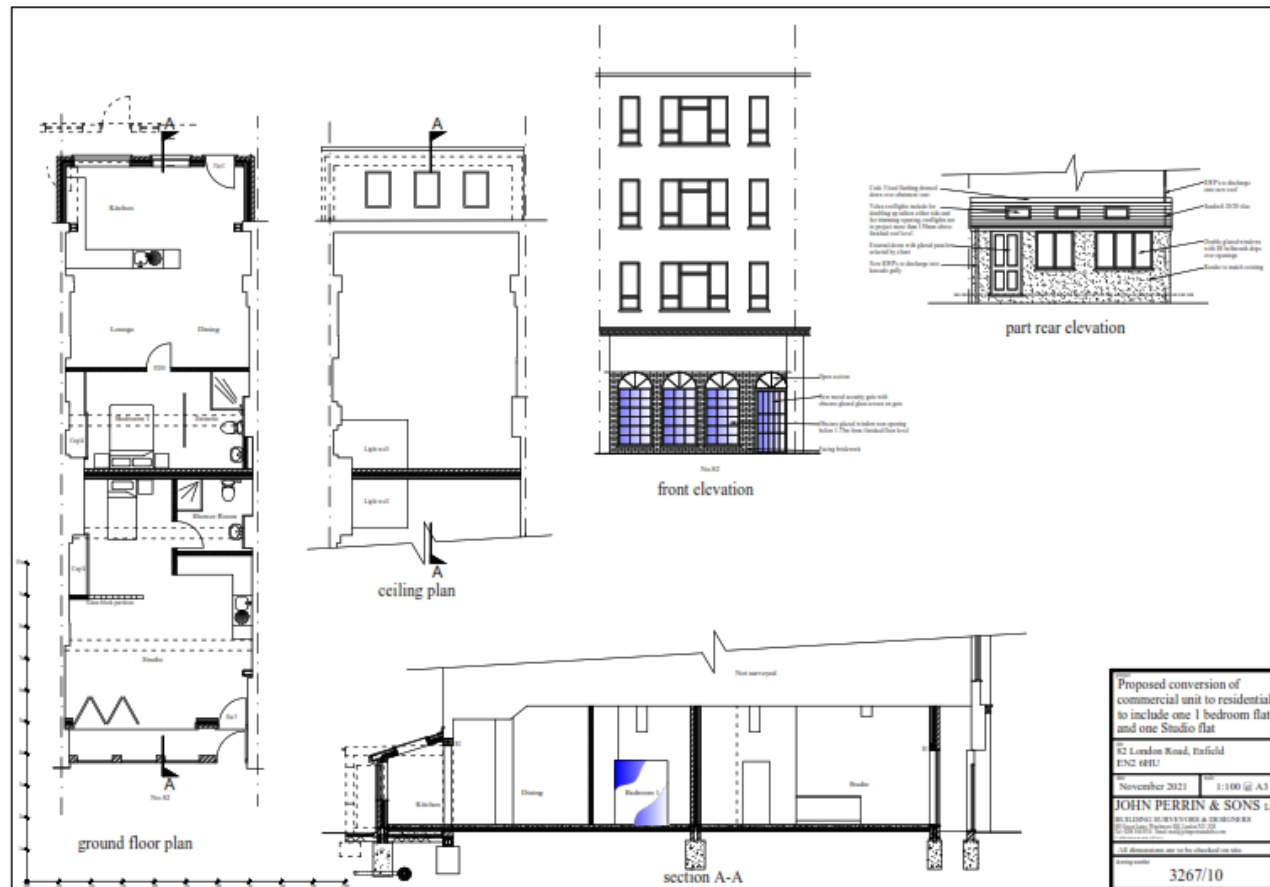
PROPOSED DEVELOPMENT.  
 TENISE IN SAME OWNERSHIP.

Property Address:  
 78-82 LONDON ROAD ENFIELD EN2 6HU  
 Dwg Title  
 SITE AND BLOCK PLAN

Scale @A3	1:500
Date	OCTOBER 2020
Dwg No.	KS   Rev

APPENDIX A

Drawings Of The Development: Proposed Ground Floor Plan, Sections & Elevations



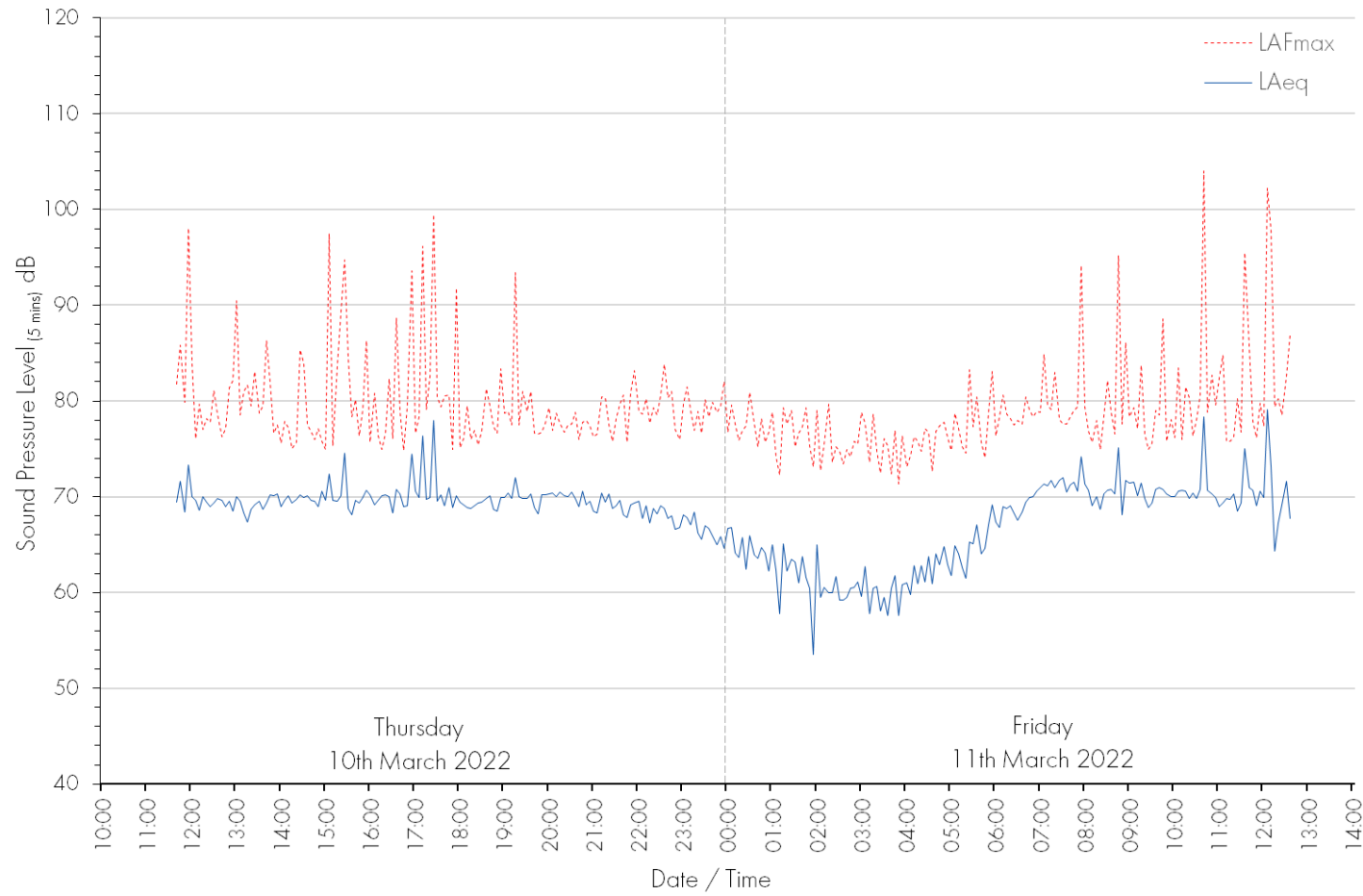
## APPENDIX B

### Noise Survey Instrumentation

- Svantek Class 1 noise monitoring station model 307 serial number 100911 with integrated preamplifier plus ST30A microphone serial number 101444
- Svantek calibrator model SV33B serial number 109969

APPENDIX C

Noise Survey Results



## APPENDIX D

### Building Envelope Acoustic Calculations

#### BS EN ISO 12354-3 BUILDING ENVELOPE SOUND INSULATION CALCULATION

SAMPLE ROOM : Studio: No.78

NOISE CONDITION : Daytime 16 hour Leq 67.5dBA free field level

Equivalent Free-Field External Sound Pressure Level Outside Sample Room:							
Daytime 16hr (7am - 11pm)	Overall dBA	Linear dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Leq,ff	67.5	64	62	61	64	61	55
<b>Building Envelope Details For Sample Room:</b>							
Element	Area (m <sup>2</sup> ) or Vent No	Element Specification / Description					
Walls	10.1	Traditional solid 9" brick					
Windows	6.9	Acoustic performance 6-18-4 double glazing ≥ Rw34dB					
Doors	2.4	Solid core wood door					
Roof & associated ceiling	0.0	None to room					
Ventilators	3	3 x high acoustic performance ventilator ≥ Dn,e,w 39dB					
<b>Element Sound Reduction Index:</b>							
Element	Area (m <sup>2</sup> ) or Vent No	dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Walls	10.1	39	44	51	58	63	68
Windows	6.9	20	23	32	36	38	40
Doors	2.4	19	22	26	24	23	20
Roof & associated ceiling	0.0						
Ventilators (Dn,e)	3	38	36	34	41	49	54
Overall Sound Reduction All Elements Combined		-22.7	-25.0	-29.3	-31.4	-31.6	-28.9
Sample Room Volume (m <sup>3</sup> ):		131.3					
Sample Room Building Envelope Surface Area (m <sup>2</sup> ):		19.4					
<b>Sample Room Characteristics:</b>							
Sample Room Type:	Bedroom	Reverberation Time (seconds) at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Reverberation Time In Furnished Sample Room		0.30	0.30	0.20	0.20	0.20	0.20
<b>Calculated Internal Sound Pressure Level In Sample Room:</b>							
Daytime 16hr (7am - 11pm)	Overall dBA	Linear dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Leq,2	33.4	38.8	34.7	27.3	28.4	25.1	22.2

## APPENDIX D

### Building Envelope Acoustic Calculations

#### BS EN ISO 12354-3 BUILDING ENVELOPE SOUND INSULATION CALCULATION

SAMPLE ROOM : Studio: No.78

NOISE CONDITION : Night-time 8 hour Leq 61.9dBA free field level

Equivalent Free-Field External Sound Pressure Level Outside Sample Room:							
Night-time 8hr (11pm - 7am)	Overall dBA	Linear dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Leq,ff	61.9	58	57	55	59	55	50
Building Envelope Details For Sample Room:							
Element	Area (m <sup>2</sup> ) or Vent No	Element Specification / Description					
Walls	10.1	Traditional solid 9" brick					
Windows	6.9	Acoustic performance 6-18-4 double glazing ≥ Rw34dB					
Doors	2.4	Solid core wood door					
Roof & associated ceiling	0.0	None to room					
Ventilators	3	3 x high acoustic performance ventilator ≥ Dn,e,w 39dB					
Element Sound Reduction Index:							
Element	Area (m <sup>2</sup> ) or Vent No	dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Walls	10.1	39	44	51	58	63	68
Windows	6.9	20	23	32	36	38	40
Doors	2.4	19	22	26	24	23	20
Roof & associated ceiling	0.0						
Ventilators (Dn,e)	3	38	36	34	41	49	54
Overall Sound Reduction All Elements Combined		-22.7	-25.0	-29.3	-31.4	-31.6	-28.9
Sample Room Volume (m <sup>3</sup> ):		131.3					
Sample Room Building Envelope Surface Area (m <sup>2</sup> ):		19.4					
Sample Room Characteristics:							
Sample Room Type:	Bedroom	Reverberation Time (seconds) at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Reverberation Time In Furnished Sample Room		0.30	0.30	0.20	0.20	0.20	0.20
Calculated Internal Sound Pressure Level In Sample Room:							
Night-time 8hr (11pm - 7am)	Overall dBA	Linear dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Leq,2	27.8	33.2	29.1	21.7	22.8	19.5	16.6



## APPENDIX D

### Building Envelope Acoustic Calculations

#### BS EN ISO 12354-3 BUILDING ENVELOPE SOUND INSULATION CALCULATION

SAMPLE ROOM : Studio: No.78  
 NOISE CONDITION : Night-time 8 hour  $L_{max}$  78dBA free field level

Equivalent Free-Field External Sound Pressure Level Outside Sample Room:							
Night-time 8hr (11pm - 7am)	Overall dBA	Linear dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
$L_{max,ff}$	78.0	75	73	71	75	72	66
Building Envelope Details For Sample Room:							
Element	Area (m <sup>2</sup> ) or Vent No	Element Specification / Description					
Walls	10.1	Traditional solid 9" brick					
Windows	6.9	Acoustic performance 6-18-4 double glazing $\geq$ Rw34dB					
Doors	2.4	Solid core wood door					
Roof & associated ceiling	0.0	None to room					
Ventilators	3	3 x high acoustic performance ventilator $\geq$ $D_{n,e,w}$ 39dB					
Element Sound Reduction Index:							
Element	Area (m <sup>2</sup> ) or Vent No	dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Walls	10.1	39	44	51	58	63	68
Windows	6.9	20	23	32	36	38	40
Doors	2.4	19	22	26	24	23	20
Roof & associated ceiling	0.0						
Ventilators ( $D_{n,e}$ )	3	38	36	34	41	49	54
Overall Sound Reduction All Elements Combined		-22.7	-25.0	-29.3	-31.4	-31.6	-28.9
Sample Room Volume (m <sup>3</sup> ):		131.3					
Sample Room Building Envelope Surface Area (m <sup>2</sup> ):		19.4					
Sample Room Characteristics:							
Sample Room Type:	Bedroom	Reverberation Time (seconds) at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
Reverberation Time In Furnished Sample Room		0.30	0.30	0.20	0.20	0.20	0.20
Calculated Internal Sound Pressure Level In Sample Room:							
Night-time 8hr (11pm - 7am)	Overall dBA	Linear dB at Octave Band Centre Frequency					
		125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz
$L_{max,2}$	43.9	49.3	45.2	37.8	38.9	35.6	32.7