

Assessment of Facade Sound Insulation at 96 Southampton Street, Reading

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0. SUMMARY

- The client is preparing a planning application for the construction of new residential dwellings at 96 Southampton Street, Reading.
- ACA Acoustics Limited has been commissioned to assess the sound climate in the vicinity of the proposed development site and consider façade sound insulation for the new residential properties. The assessment is required by the Local Planning Authority, Reading Borough Council, to assist their consideration of the planning application.
- An unmanned sound level survey was carried out by ACA Acoustics at the site over nominally a 48-hour period between 22nd and 24th June 2016. Due to inclement weather over the first 24-hours levels measured between 23rd – 24th June have been used in the acoustic assessment within this report.
- Existing ambient sound levels incident on the proposed development are comprised primarily of traffic activity on the junction of Southampton Street and Pell Street.
- A scheme for sound insulation of the building envelope has been developed such that internal sound levels during the daytime do not exceed LAeq 35dB within living rooms and bedrooms and levels at night do not exceed LAeq 30dB within bedrooms. These levels correspond with recommended guideline limits set out in BS 8233:2014. Details of the sound insulation scheme are provided within this report.
- In accordance with national planning guidance and local requirements of Reading Borough Council, it is the author's opinion that the site is suitable for residential development, subject to implementation of the noise mitigation scheme set out in this report.

1. INTRODUCTION

ACA Acoustics Limited has been commissioned to carry out an assessment of external sound levels in the vicinity of a proposed residential development at 96 Southampton Street, Reading, and, where necessary, make recommendation for a suitable sound insulation mitigation scheme.

The objective of the assessment is to determine the impact that existing noise sources would have on the proposed new dwelling in accordance with a planning condition proposed by Reading Borough Council.

This report presents results of a sound level survey and assessment along with a scheme for sound insulation such that suitable noise levels are achieved within the proposed residential dwellings and includes:

- Description of the site and development proposals;
- Confirmation of Reading Borough Council's planning consent requirements for noise;
- Measurement and assessment of existing ambient sound levels at the site;
- Specification of a scheme of sound insulation measures;
- Consideration of sound levels in external amenity areas.

2. ACOUSTIC CRITERIA

The proposed sound level measurement and assessment methodology is based on ACA Acoustics Limited's experience of undertaking assessments for similar developments.

A review of the relevant parts of each of the routinely used planning guidance documents and British Standards is provided below.

2.1 Reading Borough Council

The following planning condition has been recommended by Rebecca Moon, Environmental Health Officer:

Condition number	Condition
9.	No development shall take place until a detailed scheme, informed by an assessment of the current noise environment, for protecting the dwellings from the external noise environment of the area has been submitted to and approved, in writing, by the Local Planning Authority. The scheme itself shall be designed, specified and constructed so that the sound insulation performance of the structure and the layout of the dwellings are such that the indoor ambient noise levels do not exceed the values detailed in Table 4 of BS 8233:2014. Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agrees in writing.

Table 1: Proposed planning condition issued by London Borough of Corydon Council.

The condition makes reference to BS 8233:2014 in order to define acoustic criteria within habitable rooms. BS 8233:2014 is discussed in Section 2.2 below.

2.2 British Standard 8233:2014

In advising guidance on permissible sound levels inside residential dwellings Reading Borough Council makes reference to British Standard 8233.

The current revision of BS 8233 was published in October 2014. The introduction to BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* advises that 'this guide suggests criteria, such as suitable sleeping/resting conditions, and proposes noise levels that normally satisfy these criteria'. As such it is considered that guideline noise limits set out in BS 8233:2014 are suitable to protect future occupants of the dwelling from noise disturbance.

Guidance limits for internal noise within living rooms and bedrooms, taken from Table 4 of BS 8233:2014, are shown in Table 2 below:

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living Room	35dB LAeq, 16hr	-
Dining	Dining Room/Area	40dB LAeq, 16hr	-
Sleeping (daytime resting)	Bedroom	35dB LAeq, 16hr	30dB LAeq, 8hr

Table 2: BS 8233:2014 indoor ambient noise levels for dwellings

In addition to internal sound limits, paragraph 7.7.3.2 of the Standard advises that *‘it is desirable that the external noise level does not exceed 50dB LAeq, T, with an upper guideline value of 55dB LAeq, T which would be acceptable in noisier environments’*. However, the Standard acknowledges these external guideline values are not always achievable and notes that *‘in higher noise areas, such as ... adjoining the strategic transport network, a compromise between elevated noise levels and other factors might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in the external amenity spaces, but should not be prohibited’*.

3. REVIEW OF SITE LOCATION AND DEVELOPMENT PROPOSALS

92-96 Southampton Street is currently a row of terraced properties overlooking Southampton Street at the junction with Pell Street. A site location plan of the proposed development is shown in Figure 1 below. The proposed development includes 7 no. two bedroom apartments to be built on land to the rear of the existing properties.

The surrounding area is mix of residential and retail properties, with sound levels primarily due to traffic activity on the junction of Southampton Street and Pell Street.



Ordnance Survey (c) Crown Copyright 2015. All rights reserved. Licence number 100022432

Figure 1: Site location plan and development proposals

External amenity areas will be situated to the rear of the proposed development, experiencing significant screening from nearby roads due to the existing buildings and proposed new development. In addition, a high wall is proposed, reducing levels from the road further.

4. BACKGROUND SOUND LEVEL SURVEY

4.1 Measurement and Assessment Procedure

To assess the impact of existing noise sources, a sound level survey was conducted at the development site to determine levels incident on the proposed facades.

A single measurement position was selected for the unmanned survey at the boundary of the site overlooking Pell Street. Rooms to the rear façade will be further away and screened from the main sound sources.

The site was considered secure and so an unmanned survey was carried out using a logging type sound level meter over nominally a 48-hour period between 22nd and 24th June 2016. The weather was inclement during the first 24-hour period and measured levels will be contaminated by rain on the microphone and wind noise. Therefore, measured levels during the second 24-hour period were used in the assessment. The weather remained dry and calm during the second 24-hour survey period. Sound level measurements were recorded in terms of 15-minute samples of overall LAeq and L90 values.

4.2 Instrumentation

The following equipment was used during the survey; the sound level meter was calibrated before the survey and checked after with no change noted.

Equipment	Serial Number
Rion sound level meter type NL-31 Class 1 complete with weatherproof and lockable outdoor environmental kit	00773045
NTi Audio calibrator type CAL200 94/114dB. Compliant to IEC 60942-1:2003 (Calibrated to a reference traceable to NIST)	11441

Table 3: Equipment used

4.3 Measurement Results and Observations

Complete LAeq and LA90 value results of the sound level survey are provided in graphical form in Figure 2 on the following page.

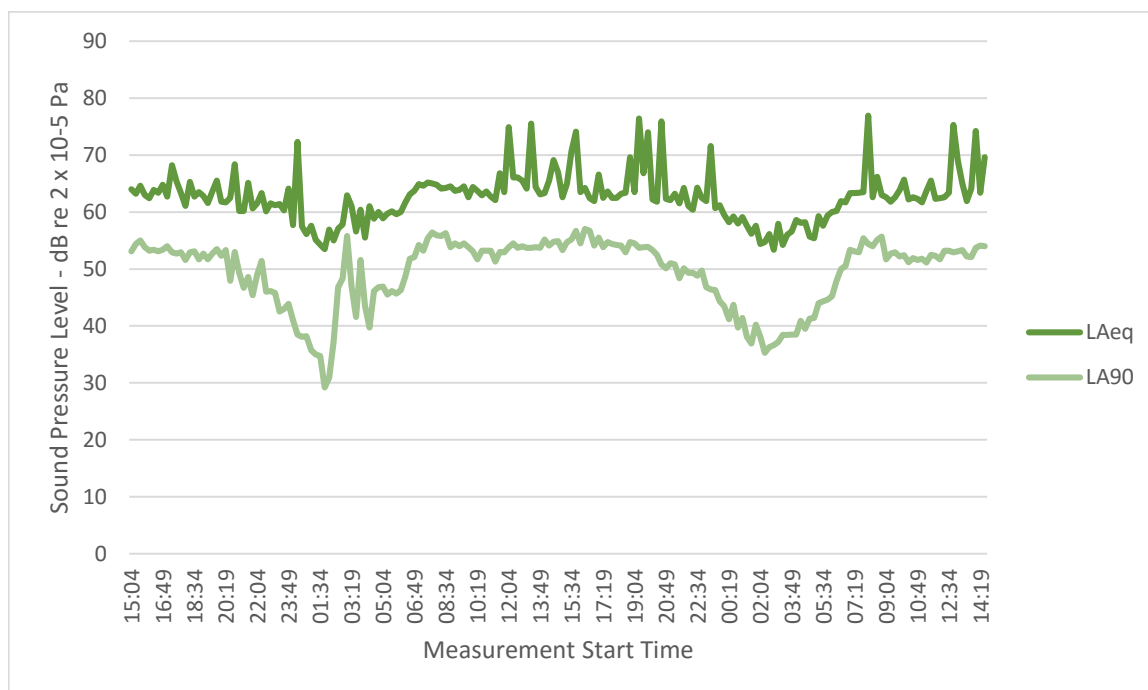


Figure 2: Sound level survey results

Summary of the 16-hour daytime and 8-hour night time period sound levels over the second 24-hour period at the unattended measurement position are shown in Table 4 below.

Description	Daytime (07:00 – 23:00) LAeq (16 hour)	Night Time (23:00 – 07:00) LAeq (8 hour)
23 rd – 24 th June 2016	64dB	61dB

Table 4: Summary noise survey results for daytime and night time periods

5. SCHEME OF FACADE SOUND INSULATION

As discussed above a scheme for sound insulation is necessary to ensure noise levels inside rooms of the new dwellings are reasonable and comply with the requirements of BS 8233:2014. By following the calculation procedures outlined in BS EN ISO 12354-3:2000 and BS 8233:2014 a specification for the acoustic performance of facade elements has been established.

Copy of acoustic calculations for daytime and night time noise intrusion into sample rooms of the property are provided in Appendix A. The calculations confirm that intrusive sound levels within rooms of the residential property will comply with guidance limits in British Standard BS 8233:2014.

An item by item scheme of the acoustic performance of the building envelope is provided below.

5.1 Walls

Walls of the new dwellings are to be traditional brick-cavity-block construction. Confirmation of the wall construction and anticipated sound insulation performance is shown below. Note that the construction provided is typical and slight variations on the specification, for example filling the cavity with insulation for thermal reasons, would be acceptable so long as the installed construction achieves the specified R_w performance.

Description	R_w (dB)	$R_w + C_{tr}$ (dB)	Typical Construction
Wall Type 1 – Brickwork			
Brickwork	52	48	102mm facing brickwork, 75mm cavity then 100mm blockwork with plasterboard on dabs to the inner face.

Table 5: Specification of facade wall sound reduction index - R_w (dB)

5.2 Glazing

Values in Table 6 on the following page show a specification schedule of glazing sound insulation performance for different parts of the development. Levels to the rear of the development will be screened from the road and so lower performance glazing may be installed as shown in Table 6.

Note that there are many permutations of possible configurations and different glazing suppliers will tend to use their own preferred configuration. Providing that the overall R_w performance and the individual octave band performance are not less than those shown in Table 6 then any alternative configuration can be used.

For all living rooms and bedrooms, the window and door frames will need to have effective acoustic seals all around. Effective seals are rubber or neoprene beaded “P” or “O” profile type

that compress all around on closure of the windows. Plastic type or brush type weathering seals are not classed as effective acoustic seals. Note that glazed doors to the apartments will require to achieve the specified performance.

Description	Octave Band Frequency – Hz (dB)						Rw (dB)	Comments
	125	250	500	1k	2k	4k		
Living rooms / Bedrooms on front facade	27	26	35	39	38	43	37	Double-glazing with asymmetric panes such as 6-16-4 Schuco AWS 60 or equivalent
Living rooms / Bedrooms on rear facade	24	20	25	35	38	35	31	Typical thermal double-glazing such as 4-16-4 IGU

Table 6: Specification of glazing sound reduction index - R (dB)

5.3 Ventilation

With regard to ventilation requirements, it is usual to satisfy the noise limits with the background ventilation rate defined by Approved Document F of the Building Regulations, rather than for the rapid ventilation rate. It is therefore anticipated that it will be necessary to incorporate an acoustic ventilation scheme into the design such that residents are able to achieve background ventilation without necessarily needing to open windows. Values in Table 7 below show a specification schedule of ventilator sound insulation performance for the development.

Description	Dn,e,w (dB)	Typical Construction
Habitable rooms on the rear facade	35	Traditional hit-and-miss trickle ventilators
Habitable rooms to the front facade	42	Acoustic ventilator such as Passivent Acoustic Window Vent ALdB 450-40 WS or equivalent

Table 7: Specification for ventilator Element Normalized Level Difference – Dn,e,w (dB)

As alternative to passive ventilation the client may prefer to provide a mechanical ventilation system such as MVHR or equivalent. Suppliers including Vent Axia or Nuaire would be able to offer suitable ventilation systems for residential purposes.

It is important that any self-noise (i.e. noise from the fans) and traffic noise intrusion through any ducted system must not cause internal sound levels to exceed the design requirements. To achieve these limits, it is recommended that the overall noise from any mechanical ventilation system will need to be no higher than LAeq 30dB during the daytime and LAeq 25dB within bedrooms overnight to allow for accumulation of noise sources.

5.4 Roof & Ceilings of Upper Floor Habitable Rooms

Top floor rooms that are directly beneath roof level will be exposed to noise break-in via the roof and ceiling structure. It is anticipated the roof will be of tiled construction with plasterboard ceilings to the rooms below.

To control noise break-in, it is recommended that ceilings to rooms below roof level be formed from minimum two layers of 12.5mm *SoundBloc* plasterboard with minimum 100mm mineral wool insulation between the beams.

5.5 External Amenity Areas

Amenity areas to the rear of the property will be significantly screened by the proposed development and levels here will be at least 10dBA to 15dBA below those measured at the front of the property. As a result, sound levels within the gardens are likely to be between 49dBA – 54dBA and comply with the guideline levels set out in BS 8233:2014 and no further mitigation measures would be necessary.

APPENDIX A

Acoustic Calculations

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-38.9	-41.9	-45.9	-45.9	-54.9	-58.9	-60.9	-65.9	
Facade Glazed Element									
	-28.3	-34.3	-33.3	-42.3	-46.3	-45.3	-50.3	-51.3	
Ventilators									
	-35.3	-37.3	-40.3	-43.3	-41.3	-43.3	-42.3	-43.3	
Cumulative Lp									
Transmission Path Rew	26.1	21.1	13.1	11.1	2.1	-5.9	-12.9	-23.9	From Row B
Transmission Path Rwi	36.7	28.7	25.7	14.7	10.7	7.7	-2.3	-9.3	From Row C
Transmission Path Dn,e	29.7	25.7	18.7	13.7	15.7	9.7	5.7	-1.3	From Row D
Result	37.8	30.9	26.7	18.3	17.2	12.4	8.0	4.6	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections									
	2.9	2.1	1.1	1.1	1.1	0.5	-0.1	-1.9	
Internal Receiver Noise									
Internal Receiver Noise - Unit 1 Bed 1									
Reverberant Field, LPrev:	40.6	33.0	27.8	19.4	18.3	12.9	7.9	2.7	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)									
	63	125	250	500	1k	2k	4k	8k		
Measured Sound Level										
Leq,ff - LAeq Bedrooms										
8ve Band Shaper - Road Traffic										
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A	
Facade Wall Element										
	-39.8	-42.8	-46.8	-46.8	-55.8	-59.8	-61.8	-66.8		
Facade Glazed Element										
	-25.6	-31.6	-30.6	-39.6	-43.6	-42.6	-47.6	-48.6		
Ventilators										
	-32.6	-34.6	-37.6	-40.6	-38.6	-40.6	-39.6	-40.6		
Cumulative Lp										
Transmission Path Rew	25.2	20.2	12.2	10.2	1.2	-6.8	-13.8	-24.8	From Row B	
Transmission Path Rwi	39.4	31.4	28.4	17.4	13.4	10.4	0.4	-6.6	From Row C	
Transmission Path Dn,e	32.4	28.4	21.4	16.4	18.4	12.4	8.4	1.4	From Row D	
Result	40.3	33.3	29.2	20.4	19.7	14.8	10.0	5.6		
ISO 12354-3 Lfs Correction										
Lfs - Facade Type Correction - 1. Plane Facade										
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Room Corrections										
	0.2	-0.6	-1.6	-1.6	-1.6	-2.2	-2.8	-4.6		
Internal Receiver Noise										
Internal Receiver Noise - Unit 1 Bed 2										
Reverberant Field, LPrev:	40.5	32.7	27.7	18.8	18.1	12.7	7.2	1.0		

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Living Rooms									
8ve Band Shaper - Road Traffic									
Leq,ff	68.0	66.0	62.0	60.0	60.0	56.0	51.0	45.0	Row A
Facade Wall Element									
	-39.3	-42.3	-46.3	-46.3	-55.3	-59.3	-61.3	-66.3	
Facade Glazed Element									
	-27.0	-33.0	-32.0	-41.0	-45.0	-44.0	-49.0	-50.0	
Ventilators									
	-39.3	-41.3	-44.3	-47.3	-45.3	-47.3	-46.3	-47.3	
Cumulative Lp									
Transmission Path Rew	28.7	23.7	15.7	13.7	4.7	-3.3	-10.3	-21.3	From Row B
Transmission Path Rwi	41.0	33.0	30.0	19.0	15.0	12.0	2.0	-5.0	From Row C
Transmission Path Dn,e	28.7	24.7	17.7	12.7	14.7	8.7	4.7	-2.3	From Row D
Result	41.5	34.1	30.4	21.0	18.2	14.1	8.2	4.7	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections									
	7.5	6.8	6.0	6.0	6.0	5.6	5.1	3.8	
Internal Receiver Noise									
Internal Receiver Noise - Unit 1 Living Room									
Reverberant Field, LPrev:	49.0	40.9	36.5	27.0	24.3	19.7	13.3	8.5	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-39.3	-42.3	-46.3	-46.3	-55.3	-59.3	-61.3	-66.3	
Facade Glazed Element									
	-26.9	-32.9	-31.9	-40.9	-44.9	-43.9	-48.9	-49.9	
Ventilators									
	-36.5	-38.5	-41.5	-44.5	-42.5	-44.5	-43.5	-44.5	
Cumulative Lp									
Transmission Path Rew	25.7	20.7	12.7	10.7	1.7	-6.3	-13.3	-24.3	From Row B
Transmission Path Rwi	38.1	30.1	27.1	16.1	12.1	9.1	-0.9	-7.9	From Row C
Transmission Path Dn,e	28.5	24.5	17.5	12.5	14.5	8.5	4.5	-2.5	From Row D
Result	38.7	31.5	27.7	18.6	16.8	12.4	7.5	4.4	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections									
	4.2	3.4	2.4	2.4	2.4	1.9	1.2	-0.6	
Internal Receiver Noise									
Internal Receiver Noise - Unit 2 Bed 1									
Reverberant Field, LPrev:	42.9	34.9	30.1	21.0	19.2	14.3	8.7	3.8	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)									
	63	125	250	500	1k	2k	4k	8k		
Measured Sound Level										
Leq,ff - LAeq Bedrooms										
8ve Band Shaper - Road Traffic										
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A	
Facade Wall Element										
	-39.5	-42.5	-46.5	-46.5	-55.5	-59.5	-61.5	-66.5		
Facade Glazed Element										
	-26.4	-32.4	-31.4	-40.4	-44.4	-43.4	-48.4	-49.4		
Ventilators										
	-32.9	-34.9	-37.9	-40.9	-38.9	-40.9	-39.9	-40.9		
Cumulative Lp										
Transmission Path Rew	25.5	20.5	12.5	10.5	1.5	-6.5	-13.5	-24.5	From Row B	
Transmission Path Rwi	38.6	30.6	27.6	16.6	12.6	9.6	-0.4	-7.4	From Row C	
Transmission Path Dn,e	32.1	28.1	21.1	16.1	18.1	12.1	8.1	1.1	From Row D	
Result	39.6	32.8	28.6	20.0	19.3	14.4	9.7	5.4		
ISO 12354-3 Lfs Correction										
Lfs - Facade Type Correction - 1. Plane Facade										
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Room Corrections										
	0.7	-0.1	-1.1	-1.1	-1.1	-1.7	-2.4	-4.1		
Internal Receiver Noise										
Internal Receiver Noise - Unit 2 Bed 2										
Reverberant Field, LPrev:	40.3	32.7	27.5	18.9	18.2	12.7	7.4	1.3		

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Living Rooms									
8ve Band Shaper - Road Traffic									
Leq,ff	68.0	66.0	62.0	60.0	60.0	56.0	51.0	45.0	Row A
Facade Wall Element									
	-41.2	-44.2	-48.2	-48.2	-57.2	-61.2	-63.2	-68.2	
Facade Glazed Element									
	-23.8	-29.8	-28.8	-37.8	-41.8	-40.8	-45.8	-46.8	
Ventilators									
	-36.6	-38.6	-41.6	-44.6	-42.6	-44.6	-43.6	-44.6	
Cumulative Lp									
Transmission Path Rew	26.8	21.8	13.8	11.8	2.8	-5.2	-12.2	-23.2	From Row B
Transmission Path Rwi	44.2	36.2	33.2	22.2	18.2	15.2	5.2	-1.8	From Row C
Transmission Path Dn,e	31.4	27.4	20.4	15.4	17.4	11.4	7.4	0.4	From Row D
Result	44.5	36.9	33.5	23.4	21.0	16.9	10.4	5.7	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections									
	3.5	2.9	2.1	2.1	2.1	1.6	1.1	-0.2	
Internal Receiver Noise									
Internal Receiver Noise - Unit 2 Living Room									
Reverberant Field, LPrev:	48.0	39.7	35.5	25.4	23.0	18.5	11.4	5.6	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)									
	63	125	250	500	1k	2k	4k	8k		
Measured Sound Level										
Leq,ff - LAeq Bedrooms										
8ve Band Shaper - Road Traffic										
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A	
Facade Wall Element										
	-39.2	-42.2	-46.2	-46.2	-55.2	-59.2	-61.2	-66.2		
Facade Glazed Element										
	-27.2	-33.2	-32.2	-41.2	-45.2	-44.2	-49.2	-50.2		
Ventilators										
	-34.2	-36.2	-39.2	-42.2	-40.2	-42.2	-41.2	-42.2		
Cumulative Lp										
Transmission Path Rew	25.8	20.8	12.8	10.8	1.8	-6.2	-13.2	-24.2	From Row B	
Transmission Path Rwi	37.8	29.8	26.8	15.8	11.8	8.8	-1.2	-8.2	From Row C	
Transmission Path Dn,e	30.8	26.8	19.8	14.8	16.8	10.8	6.8	-0.2	From Row D	
Result	38.8	31.9	27.8	19.2	18.3	13.4	8.8	4.9		
ISO 12354-3 Lfs Correction										
Lfs - Facade Type Correction - 1. Plane Facade										
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Room Corrections										
	2.6	1.8	0.8	0.8	0.8	0.2	-0.4	-2.2		
Internal Receiver Noise										
Internal Receiver Noise - Unit 3 Bed 1										
Reverberant Field, LPrev:	41.4	33.7	28.6	20.0	19.1	13.7	8.4	2.8		

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-39.7	-42.7	-46.7	-46.7	-55.7	-59.7	-61.7	-66.7	
Facade Glazed Element									
	-25.9	-31.9	-30.9	-39.9	-43.9	-42.9	-47.9	-48.9	
Ventilators									
	-32.9	-34.9	-37.9	-40.9	-38.9	-40.9	-39.9	-40.9	
Cumulative Lp									
Transmission Path Rew	25.3	20.3	12.3	10.3	1.3	-6.7	-13.7	-24.7	From Row B
Transmission Path Rwi	39.1	31.1	28.1	17.1	13.1	10.1	0.1	-6.9	From Row C
Transmission Path Dn,e	32.1	28.1	21.1	16.1	18.1	12.1	8.1	1.1	From Row D
Result	40.0	33.1	29.0	20.2	19.4	14.5	9.8	5.4	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections									
	3.4	2.6	1.6	1.6	1.6	1.0	0.4	-1.4	
Internal Receiver Noise									
Internal Receiver Noise - Unit 3 Bed 2									
Reverberant Field, LPrev:	43.4	35.7	30.6	21.8	21.1	15.6	10.1	4.0	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Living Rooms									
8ve Band Shaper - Road Traffic									
Leq,ff	68.0	66.0	62.0	60.0	60.0	56.0	51.0	45.0	Row A
Facade Wall Element									
	-41.2	-44.2	-48.2	-48.2	-57.2	-61.2	-63.2	-68.2	
Facade Glazed Element									
	-23.8	-29.8	-28.8	-37.8	-41.8	-40.8	-45.8	-46.8	
Ventilators									
	-36.6	-38.6	-41.6	-44.6	-42.6	-44.6	-43.6	-44.6	
Cumulative Lp									
Transmission Path Rew	26.8	21.8	13.8	11.8	2.8	-5.2	-12.2	-23.2	From Row B
Transmission Path Rwi	44.2	36.2	33.2	22.2	18.2	15.2	5.2	-1.8	From Row C
Transmission Path Dn,e	31.4	27.4	20.4	15.4	17.4	11.4	7.4	0.4	From Row D
Result	44.5	36.9	33.5	23.4	21.0	16.9	10.4	5.7	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections									
	3.5	2.9	2.1	2.1	2.1	1.6	1.1	-0.2	
Internal Receiver Noise									
Internal Receiver Noise - Unit 3 Living Room									
Reverberant Field, LPrev:	48.0	39.7	35.5	25.4	23.0	18.5	11.4	5.6	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-42.4	-45.4	-49.4	-49.4	-58.4	-62.4	-64.4	-69.4	
Facade Glazed Element									
	-31.4	-37.4	-36.4	-45.4	-49.4	-48.4	-53.4	-54.4	
Facade Roof Element									
	-25.6	-29.6	-39.6	-45.6	-50.6	-54.6	-57.6	-	
Ventilators									
	-37.4	-39.4	-42.4	-45.4	-43.4	-45.4	-44.4	-45.4	
Cumulative Lp									
Transmission Path Rew	22.6	17.6	9.6	7.6	-1.4	-9.4	-16.4	-27.4	From Row B
Transmission Path Rwi	33.6	25.6	22.6	11.6	7.6	4.6	-5.4	-12.4	From Row C
Transmission Path Rrr	39.4	33.4	19.4	11.4	6.4	-1.6	-9.6	-	From Row D
Transmission Path Dn,e	27.6	23.6	16.6	11.6	13.6	7.6	3.6	-3.4	From Row E
Result	40.7	34.5	25.1	16.9	15.4	10.2	5.7	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	7.2	6.4	5.5	5.5	5.5	4.9	4.2	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 4 Bed 1									
Reverberant Field, LPrev:	47.9	40.9	30.6	22.4	20.9	15.1	9.9	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-42.3	-45.3	-49.3	-49.3	-58.3	-62.3	-64.3	-69.3	
Facade Glazed Element									
	-29.9	-35.9	-34.9	-43.9	-47.9	-46.9	-51.9	-52.9	
Facade Roof Element									
	-26.0	-30.0	-40.0	-46.0	-51.0	-55.0	-58.0	-	
Ventilators									
	-35.9	-37.9	-40.9	-43.9	-41.9	-43.9	-42.9	-43.9	
Cumulative Lp									
Transmission Path Rew	22.7	17.7	9.7	7.7	-1.3	-9.3	-16.3	-27.3	From Row B
Transmission Path Rwi	35.1	27.1	24.1	13.1	9.1	6.1	-3.9	-10.9	From Row C
Transmission Path Rrr	39.0	33.0	19.0	11.0	6.0	-2.0	-10.0	-	From Row D
Transmission Path Dn,e	29.1	25.1	18.1	13.1	15.1	9.1	5.1	-1.9	From Row E
Result	40.8	34.6	26.1	17.8	16.6	11.4	6.8	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	7.6	6.8	5.8	5.8	5.8	5.2	4.6	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 4 Bed 2									
Reverberant Field, LPrev:	48.4	41.4	31.9	23.6	22.4	16.6	11.3	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Living Rooms									
8ve Band Shaper - Road Traffic									
Leq,ff	68.0	66.0	62.0	60.0	60.0	56.0	51.0	45.0	Row A
Facade Wall Element									
	-41.3	-44.3	-48.3	-48.3	-57.3	-61.3	-63.3	-68.3	
Facade Glazed Element									
	-30.9	-36.9	-35.9	-44.9	-48.9	-47.9	-52.9	-53.9	
Facade Roof Element									
	-26.7	-30.7	-40.7	-46.7	-51.7	-55.7	-58.7	-	
Ventilators									
	-42.6	-44.6	-47.6	-50.6	-48.6	-50.6	-49.6	-50.6	
Cumulative Lp									
Transmission Path Rew	26.7	21.7	13.7	11.7	2.7	-5.3	-12.3	-23.3	From Row B
Transmission Path Rwi	37.1	29.1	26.1	15.1	11.1	8.1	-1.9	-8.9	From Row C
Transmission Path Rrr	41.3	35.3	21.3	13.3	8.3	0.3	-7.7	-	From Row D
Transmission Path Dn,e	25.4	21.4	14.4	9.4	11.4	5.4	1.4	-5.6	From Row E
Result	42.9	36.5	27.8	19.0	15.6	10.9	5.1	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	8.4	7.7	6.9	6.9	6.9	6.5	6.0	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 4 Living Room									
Reverberant Field, LPrev:	51.3	44.3	34.7	25.9	22.6	17.4	11.1	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)									
	63	125	250	500	1k	2k	4k	8k		
Measured Sound Level										
Leq,ff - LAeq Bedrooms										
8ve Band Shaper - Road Traffic										
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A	
Facade Wall Element										
	-42.0	-45.0	-49.0	-49.0	-58.0	-62.0	-64.0	-69.0		
Facade Glazed Element										
	-32.2	-38.2	-37.2	-46.2	-50.2	-49.2	-54.2	-55.2		
Facade Roof Element										
	-25.8	-29.8	-39.8	-45.8	-50.8	-54.8	-57.8	-		
Ventilators										
	-38.2	-40.2	-43.2	-46.2	-44.2	-46.2	-45.2	-46.2		
Cumulative Lp										
Transmission Path Rew	23.0	18.0	10.0	8.0	-1.0	-9.0	-16.0	-27.0	From Row B	
Transmission Path Rwi	32.8	24.8	21.8	10.8	6.8	3.8	-6.2	-13.2	From Row C	
Transmission Path Rrr	39.2	33.2	19.2	11.2	6.2	-1.8	-9.8	-	From Row D	
Transmission Path Dn,e	26.8	22.8	15.8	10.8	12.8	6.8	2.8	-4.2	From Row E	
Result	40.4	34.2	24.5	16.5	14.7	9.5	5.1	-		
ISO 12354-3 Lfs Correction										
Lfs - Facade Type Correction - 1. Plane Facade										
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-		
Room Corrections										
	7.3	6.5	5.6	5.6	5.6	5.0	4.3	-		
Internal Receiver Noise										
Internal Receiver Noise - Unit 5 Bed 1										
Reverberant Field, LPrev:	47.7	40.8	30.1	22.1	20.3	14.5	9.5	-		

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-42.5	-45.5	-49.5	-49.5	-58.5	-62.5	-64.5	-69.5	
Facade Glazed Element									
	-30.8	-36.8	-35.8	-44.8	-48.8	-47.8	-52.8	-53.8	
Facade Roof Element									
	-25.6	-29.6	-39.6	-45.6	-50.6	-54.6	-57.6	-	
Ventilators									
	-36.8	-38.8	-41.8	-44.8	-42.8	-44.8	-43.8	-44.8	
Cumulative Lp									
Transmission Path Rew	22.5	17.5	9.5	7.5	-1.5	-9.5	-16.5	-27.5	From Row B
Transmission Path Rwi	34.2	26.2	23.2	12.2	8.2	5.2	-4.8	-11.8	From Row C
Transmission Path Rrr	39.4	33.4	19.4	11.4	6.4	-1.6	-9.6	-	From Row D
Transmission Path Dn,e	28.2	24.2	17.2	12.2	14.2	8.2	4.2	-2.8	From Row E
Result	40.8	34.6	25.5	17.3	15.9	10.7	6.1	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	6.6	5.8	4.8	4.8	4.8	4.2	3.6	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 5 Bed 2									
Reverberant Field, LPrev:	47.4	40.4	30.4	22.1	20.7	14.9	9.7	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Living Rooms									
8ve Band Shaper - Road Traffic									
Leq,ff	68.0	66.0	62.0	60.0	60.0	56.0	51.0	45.0	Row A
Facade Wall Element									
	-40.9	-43.9	-47.9	-47.9	-56.9	-60.9	-62.9	-67.9	
Facade Glazed Element									
	-30.2	-36.2	-35.2	-44.2	-48.2	-47.2	-52.2	-53.2	
Facade Roof Element									
	-27.3	-31.3	-41.3	-47.3	-52.3	-56.3	-59.3	-	
Ventilators									
	-41.9	-43.9	-46.9	-49.9	-47.9	-49.9	-48.9	-49.9	
Cumulative Lp									
Transmission Path Rew	27.1	22.1	14.1	12.1	3.1	-4.9	-11.9	-22.9	From Row B
Transmission Path Rwi	37.8	29.8	26.8	15.8	11.8	8.8	-1.2	-8.2	From Row C
Transmission Path Rrr	40.7	34.7	20.7	12.7	7.7	-0.3	-8.3	-	From Row D
Transmission Path Dn,e	26.1	22.1	15.1	10.1	12.1	6.1	2.1	-4.9	From Row E
Result	42.7	36.2	28.2	19.3	16.1	11.5	5.6	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	8.8	8.2	7.4	7.4	7.4	6.9	6.4	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 5 Living Room									
Reverberant Field, LPrev:	51.5	44.4	35.6	26.6	23.4	18.4	12.0	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-44.3	-47.3	-51.3	-51.3	-60.3	-64.3	-66.3	-71.3	
Facade Glazed Element									
	-28.4	-34.4	-33.4	-42.4	-46.4	-45.4	-50.4	-51.4	
Facade Roof Element									
	-25.3	-29.3	-39.3	-45.3	-50.3	-54.3	-57.3	-	
Ventilators									
	-38.0	-40.0	-43.0	-46.0	-44.0	-46.0	-45.0	-46.0	
Cumulative Lp									
Transmission Path Rew	20.7	15.7	7.7	5.7	-3.3	-11.3	-18.3	-29.3	From Row B
Transmission Path Rwi	36.6	28.6	25.6	14.6	10.6	7.6	-2.4	-9.4	From Row C
Transmission Path Rrr	39.7	33.7	19.7	11.7	6.7	-1.3	-9.3	-	From Row D
Transmission Path Dn,e	27.0	23.0	16.0	11.0	13.0	7.0	3.0	-4.0	From Row E
Result	41.6	35.2	27.0	17.8	15.7	11.0	5.7	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	6.8	6.0	5.0	5.0	5.0	4.5	3.8	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 6 Bed 1									
Reverberant Field, LPrev:	48.4	41.2	32.1	22.9	20.8	15.5	9.5	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-42.8	-45.8	-49.8	-49.8	-58.8	-62.8	-64.8	-69.8	
Facade Glazed Element									
	-29.7	-35.7	-34.7	-43.7	-47.7	-46.7	-51.7	-52.7	
Facade Roof Element									
	-25.7	-29.7	-39.7	-45.7	-50.7	-54.7	-57.7	-	
Ventilators									
	-35.7	-37.7	-40.7	-43.7	-41.7	-43.7	-42.7	-43.7	
Cumulative Lp									
Transmission Path Rew	22.2	17.2	9.2	7.2	-1.8	-9.8	-16.8	-27.8	From Row B
Transmission Path Rwi	35.3	27.3	24.3	13.3	9.3	6.3	-3.7	-10.7	From Row C
Transmission Path Rrr	39.3	33.3	19.3	11.3	6.3	-1.7	-9.7	-	From Row D
Transmission Path Dn,e	29.3	25.3	18.3	13.3	15.3	9.3	5.3	-1.7	From Row E
Result	41.1	34.9	26.3	17.9	16.8	11.6	6.9	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	7.9	7.1	6.2	6.2	6.2	5.6	4.9	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 6 Bed 2									
Reverberant Field, LPrev:	49.0	42.0	32.5	24.1	23.0	17.2	11.8	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)									
	63	125	250	500	1k	2k	4k	8k		
Measured Sound Level										
Leq,ff - LAeq Living Rooms										
8ve Band Shaper - Road Traffic										
Leq,ff	68.0	66.0	62.0	60.0	60.0	56.0	51.0	45.0	Row A	
Facade Wall Element										
	-39.4	-42.4	-46.4	-46.4	-55.4	-59.4	-61.4	-66.4		
Facade Glazed Element										
	-26.6	-32.6	-31.6	-40.6	-44.6	-43.6	-48.6	-49.6		
Ventilators										
	-37.7	-39.7	-42.7	-45.7	-43.7	-45.7	-44.7	-45.7		
Cumulative Lp										
Transmission Path Rew	28.6	23.6	15.6	13.6	4.6	-3.4	-10.4	-21.4	From Row B	
Transmission Path Rwi	41.4	33.4	30.4	19.4	15.4	12.4	2.4	-4.6	From Row C	
Transmission Path Dn,e	30.3	26.3	19.3	14.3	16.3	10.3	6.3	-0.7	From Row D	
Result	42.0	34.6	30.9	21.5	19.2	14.9	9.1	5.1		
ISO 12354-3 Lfs Correction										
Lfs - Facade Type Correction - 1. Plane Facade										
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
Room Corrections										
	3.9	3.2	2.4	2.4	2.4	2.0	1.5	0.2		
Internal Receiver Noise										
Internal Receiver Noise - Unit 6 Living Room										
Reverberant Field, LPrev:	45.9	37.8	33.3	23.9	21.6	16.9	10.6	5.3		

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)									
	63	125	250	500	1k	2k	4k	8k		
Measured Sound Level										
Leq,ff - LAeq Bedrooms										
8ve Band Shaper - Road Traffic										
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A	
Facade Wall Element										
	-42.9	-45.9	-49.9	-49.9	-58.9	-62.9	-64.9	-69.9		
Facade Glazed Element										
	-30.7	-36.7	-35.7	-44.7	-48.7	-47.7	-52.7	-53.7		
Facade Roof Element										
	-25.4	-29.4	-39.4	-45.4	-50.4	-54.4	-57.4	-		
Ventilators										
	-37.9	-39.9	-42.9	-45.9	-43.9	-45.9	-44.9	-45.9		
Cumulative Lp										
Transmission Path Rew	22.1	17.1	9.1	7.1	-1.9	-9.9	-16.9	-27.9	From Row B	
Transmission Path Rwi	34.3	26.3	23.3	12.3	8.3	5.3	-4.7	-11.7	From Row C	
Transmission Path Rrr	39.6	33.6	19.6	11.6	6.6	-1.4	-9.4	-	From Row D	
Transmission Path Dn,e	27.1	23.1	16.1	11.1	13.1	7.1	3.1	-3.9	From Row E	
Result	40.9	34.7	25.5	17.0	15.2	10.1	5.5	-		
ISO 12354-3 Lfs Correction										
Lfs - Facade Type Correction - 1. Plane Facade										
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-		
Room Corrections										
	7.4	6.6	5.6	5.6	5.6	5.0	4.4	-		
Internal Receiver Noise										
Internal Receiver Noise - Unit 7 Bed 1										
Reverberant Field, LPrev:	48.3	41.3	31.1	22.6	20.8	15.2	9.8	-		

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Bedrooms									
8ve Band Shaper - Road Traffic									
Leq,ff	65.0	63.0	59.0	57.0	57.0	53.0	48.0	42.0	Row A
Facade Wall Element									
	-40.5	-43.5	-47.5	-47.5	-56.5	-60.5	-62.5	-67.5	
Facade Glazed Element									
	-30.3	-36.3	-35.3	-44.3	-48.3	-47.3	-52.3	-53.3	
Facade Roof Element									
	-27.9	-31.9	-41.9	-47.9	-52.9	-56.9	-59.9	-	
Ventilators									
	-37.3	-39.3	-42.3	-45.3	-43.3	-45.3	-44.3	-45.3	
Cumulative Lp									
Transmission Path Rew	24.5	19.5	11.5	9.5	0.5	-7.5	-14.5	-25.5	From Row B
Transmission Path Rwi	34.7	26.7	23.7	12.7	8.7	5.7	-4.3	-11.3	From Row C
Transmission Path Rrr	37.1	31.1	17.1	9.1	4.1	-3.9	-11.9	-	From Row D
Transmission Path Dn,e	27.7	23.7	16.7	11.7	13.7	7.7	3.7	-3.3	From Row E
Result	39.5	33.2	25.4	17.1	15.5	10.5	5.8	-	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	
Room Corrections									
	9.4	8.7	7.7	7.7	7.7	7.1	6.4	-	
Internal Receiver Noise									
Internal Receiver Noise - Unit 7 Bed 2									
Reverberant Field, LPrev:	49.0	41.9	33.1	24.8	23.2	17.6	12.3	-	

Calculation Sheet

Room Reference

	Octave Band Centre Frequency (Hz)								
	63	125	250	500	1k	2k	4k	8k	
Measured Sound Level									
Leq,ff - LAeq Living Rooms									
8ve Band Shaper - Road Traffic									
Leq,ff	68.0	66.0	62.0	60.0	60.0	56.0	51.0	45.0	Row A
Facade Wall Element									
	-39.3	-42.3	-46.3	-46.3	-55.3	-59.3	-61.3	-66.3	
Facade Glazed Element									
	-26.9	-32.9	-31.9	-40.9	-44.9	-43.9	-48.9	-49.9	
Ventilators									
	-39.6	-41.6	-44.6	-47.6	-45.6	-47.6	-46.6	-47.6	
Cumulative Lp									
Transmission Path Rew	28.7	23.7	15.7	13.7	4.7	-3.3	-10.3	-21.3	From Row B
Transmission Path Rwi	41.1	33.1	30.1	19.1	15.1	12.1	2.1	-4.9	From Row C
Transmission Path Dn,e	28.4	24.4	17.4	12.4	14.4	8.4	4.4	-2.6	From Row D
Result	41.5	34.1	30.5	20.9	18.1	14.1	8.1	4.6	
ISO 12354-3 Lfs Correction									
Lfs - Facade Type Correction - 1. Plane Facade									
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Room Corrections									
	7.3	6.6	5.8	5.8	5.8	5.4	4.8	3.6	
Internal Receiver Noise									
Internal Receiver Noise - Unit 7 Living Room									
Reverberant Field, LPrev:	48.8	40.7	36.3	26.7	23.9	19.4	12.9	8.2	