



Architectural & Environmental Acousticians

Noise & Vibration Engineers

Noise Assessment

45 Caversham Road, Reading

Noise Assessment

Project: 45 CAVERSHAM ROAD, READING

Report reference: RP01-20392

Client: ELSTREE LAND LTD
14 MERRIL DRIVE
WINNERSH
BERKSHIRE
RG41 5RS

Our details: CASS ALLEN ASSOCIATES LTD
BEDFORD I-LAB
BEDFORD
MK44 3RZ

Document control:

REVISION	ISSUE DATE	REPORT BY	CHECKED BY	NOTES
0	03 July 2020	Laura Broadley, MSc AMIOA, Acoustics Consultant	Chris McNeillie, MSc CEng MIOA, Director	Initial issue

TABLE OF CONTENTS

1. INTRODUCTION
2. PROJECT DESCRIPTION
3. PLANNING POLICY
4. NOISE AFFECTING THE DEVELOPMENT
5. CONCLUSIONS

APPENDIX 1 SITE PLAN

APPENDIX 2 SURVEY RESULTS

APPENDIX 3 FACADE CALCULATIONS

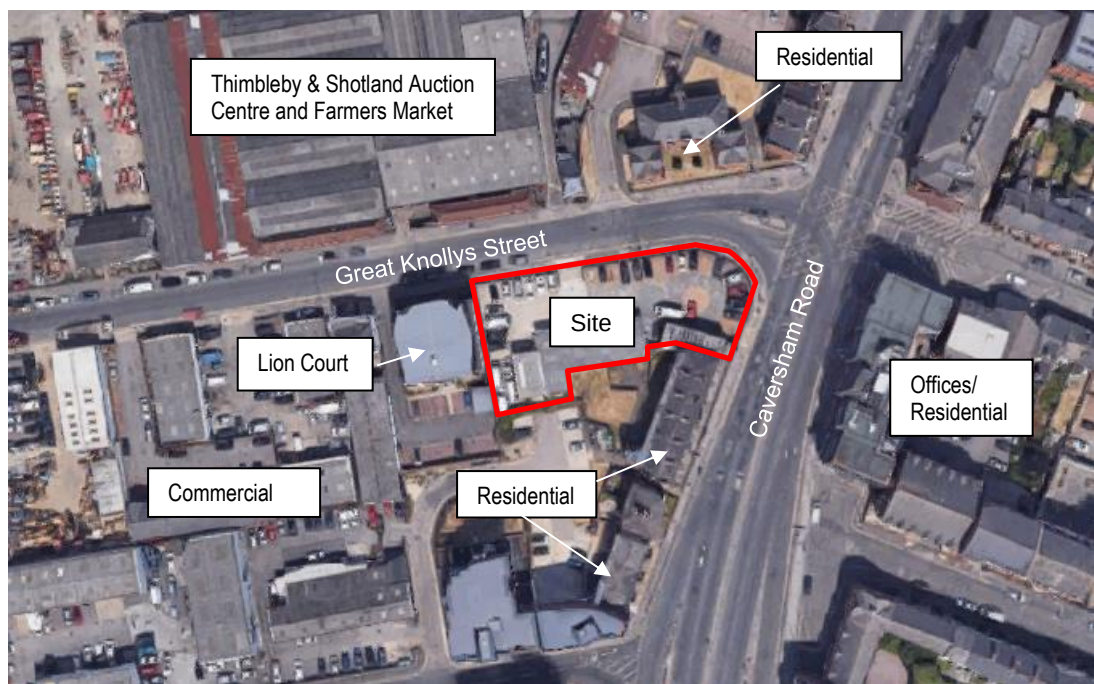
1. INTRODUCTION

- 1.1 Cass Allen has been instructed by Elstree Land Ltd to assess the noise impact of a proposed new development at 45 Caversham Road in Reading.
- 1.2 The assessment has been carried out in accordance with relevant local and national planning guidance.
- 1.3 The aims of the assessment were:
- To establish the suitability of existing noise levels at the site for the proposed development;
 - Where required, identify appropriate measures to optimise the acoustic design of the development and achieve acceptable noise levels in habitable areas.
- 1.4 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

2. PROJECT DESCRIPTION

- 2.1 The site is currently occupied by Avis Car Rental and is located in a mixed-use area, bounded to the north by Great Knollys Street and to the east by Caversham Road. To the south of the site are residential dwellings. A new residential development is also situated to the west of the site (Lion Court). Further to the east are offices and residential premises and to the north is residential and commercial premises including Thimbleby & Shotland Auction Centre and Farmers Market.
- 2.2 An annotated aerial photo of the site is shown in Figure 1 below.

Figure 1 Annotated Aerial Photo



- 2.3 The proposal is to develop the site into dual aspect residential dwellings with an area at the south of the site allocated for a communal landscaped amenity garden. There are balconies at the front and rear of the development and rooftop terraces. A current drawing of the proposed development layout is shown in Appendix 1.

3. PLANNING POLICY

National Policy

- 3.1 Outline guidance for the assessment of noise affecting new developments is given in the National Planning Policy Framework (NPPF). Section 170 of the NPPF states:

Planning policies and decisions should contribute to and enhance the natural and local environment by ... preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of ...noise pollution.

and in Section 180:

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*

Local policy

- 3.2 Reading Borough Council's Local Plan (November 2019) provides outline guidance on the assessment of noise affecting new development in the borough. Policy EN16: Pollution and Water Resources states that:

Development will only be permitted where it would not be damaging to the environment and sensitive receptors through land, noise or light pollution...

- 3.2 The Local Plan further explains:

4.2.90 Exposure to high levels of noise can have a significant effect on human health...It is worth noting that there is a Professional Practice Guide on Planning and Noise available which provides guidance on design of residential developments to take account of noise, and taking account of this from the early design stage will help to reduce noise effects on future residents.

- 3.3 To address the requirements of the national and local policies, noise affecting the habitable areas of the proposed development has been assessed.

4. NOISE AFFECTING THE DEVELOPMENT

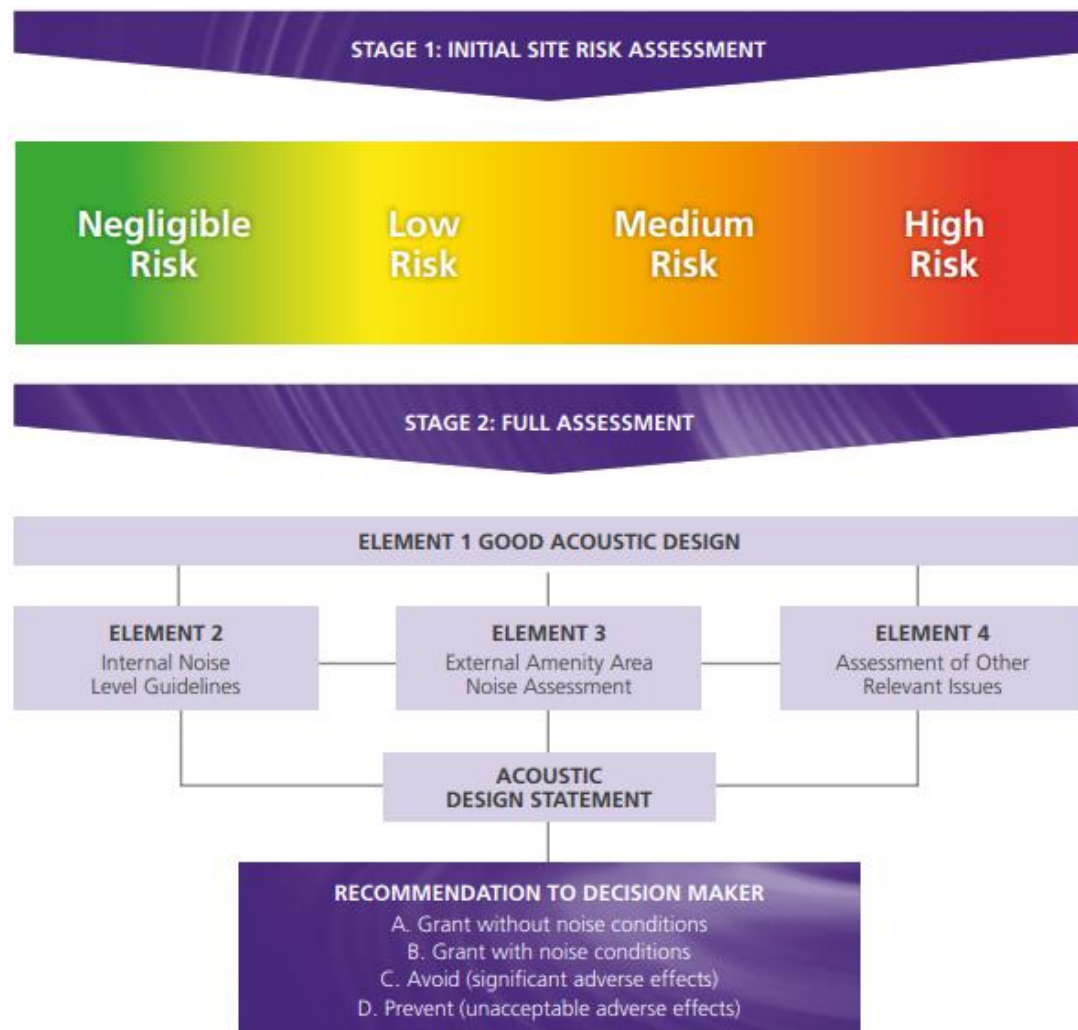
4.1 Specific guidance on the assessment of noise affecting new residential development is given in ProPG: Planning and Noise for New Residential Development, May 2017 (ProPG). This guidance is considered to be current 'best practice' and is the guidance referred to in Reading Borough Council's Local Plan.

4.2 The assessment process can be summarised as follows:

- Stage 1 – measure noise levels at the site and carry out an initial noise risk assessment of the proposed development site based on the measured levels.
- Stage 2 – where a higher noise risk is identified, carry out a detailed assessment including the following four considerations:
 - Element 1 – the overall acoustic design and layout of the site
 - Element 2 – internal noise levels in habitable areas
 - Element 3 – noise levels in external amenity areas
 - Element 4 – consideration of other relevant issues
- Based on the results of the Stage assessment, provide a recommendation to the decision maker on whether planning permission can and should be granted.

4.3 The process is shown visually in Figure 2 below

Figure 2 ProPG Assessment Process



Stage 1 – Noise survey and initial assessment

- 4.4 A noise survey was carried out at the site from the 19th to 23rd June 2020 to assess existing noise levels in the area. The full methodology and results of the noise survey are provided in Appendix 2.
- 4.5 Average (LAeq,T) and maximum (LAmax) noise levels across the site were generally dictated by road traffic on Caversham Road. Average and maximum noise levels were also affected by sporadic vehicle movements and siren sounds on Great Knollys Street as Reading Ambulance Station is situated to the west of the site. Ambulance sirens occasionally occur when accessing Caversham Road from Great Knollys Street.
- 4.6 Noise from Thimbleby & Shotland Auction Centre and nearby commercial premises was insignificant in comparison to noise from Caversham Road.

- 4.7 Background noise levels (LA90) across the site were dictated by constant road traffic noise from Caversham Road.
- 4.8 Reading train station is also located nearby however noise from train movements was insignificant when compared with noise from road traffic on Caversham Road.
- 4.9 Areas of the development at the eastern edge of the site will be subject to the highest noise levels due to road traffic noise emissions. The noise survey results show that free-field noise levels at these positions are as follows:
- Eastern edge of the site facing Caversham Road:
 - Average noise levels during the daytime - 75 dB LAeq,0700-2300hrs;
 - Average noise levels during the night-time - 67 dB LAeq,2300-0700hrs;
 - Typical maximum noise levels during the night-time - 86 dB L_{Amax}.
- 4.10 The measured noise levels can be compared with Figure 3 below to assess the 'noise risk' of the site. Where the noise risk is high, significant acoustic design measures may be required to achieve acceptable noise levels in the development. Where the noise risk is low, acceptable noise levels may be achievable with no specific acoustic design measures.

Figure 3 Noise Risk Assessment (Adaption of Figure 1 from ProPG)



- 4.11 It can be seen from a comparison of the measured noise levels in paragraph 4.9 above with Figure 3 that the site is a 'High' risk in relation to daytime and night-time noise levels, which is common for sites in urban areas near to main roads. ProPG would therefore require that a more detailed 'Stage 2' assessment is carried out.

Stage 2 – Element 1 – Overall acoustic design of the site

- 4.12 The acoustic design of development has been reviewed in relation to the measured noise levels at the site. In this case, acoustically attenuating the facades overlooking the road would offer potential improvement to the acoustic design of the development by reducing noise levels in habitable rooms. The development has been designed that wherever possible, dwellings will have habitable rooms on a quieter façade at the rear of the site.
- 4.13 We understand that the treatment of the facades with noise mitigation is the preferred approach in this case. This approach is in line with current planning guidance, where the efficient use of land and the need for housing is a priority. The layout of the development is also good in our view as

the external communal garden is at the south of the development, being shielded from surrounding road noise and therefore all residents will have access to a quiet amenity area.

- 4.14 The noise levels that will exist in the habitable rooms is discussed further below along with recommendations for appropriate façade treatments.

Stage 2 – Element 2 - Internal noise levels

- 4.15 Appropriate design criteria for acceptable noise levels in acoustically sensitive areas of new developments are given in BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'.
- 4.16 Relevant BS8233 design criteria are summarised in Table 1 below.

Table 1 BS8233:2014 Internal Noise Criteria

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq,16hour	-
Dining	Dining room/area	40 dB LAeq,16hour	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour

- 4.17 The following acoustic design criteria have therefore been adopted for the development:
- Average noise levels in living rooms and dining rooms during the day should not exceed 35 dB LAeq,0700-2300hrs and 40 dB LAeq,0700-2300hrs respectively;
 - Average noise levels in bedrooms should not exceed 35 dB LAeq,0700-2300hrs during the day and 30 dB LAeq,2300-0700hrs during the night;
 - Maximum noise levels should not regularly exceed 45 dB L_{Amax} in bedrooms during the night.
- 4.18 Full construction details for the development have not been finalised as the project is at an early design stage. It has therefore been assumed that the external walls of the development will be constructed using a standard masonry construction (e.g. 102mm brick, 100mm insulated cavity, 100mm concrete block) or a light-weight construction designed to achieve a similar level of sound insulation (this is technically achievable subject to detailed design). Consequently, internal noise levels would be dictated by external noise ingress via glazing and ventilators.
- 4.19 The ventilation scheme for the project has not yet been decided and therefore, for the purpose of the assessment, it has been assumed that units will utilise Mechanical Ventilation with Heat Recovery (MVHR) i.e. System 4 from Building Regulations Part F. Therefore, there will be no background ventilators in the external façades (e.g. trickle ventilators etc).
- 4.20 The MVHR system should be selected to ensure that noise from air supply and extract ductwork does not exceed acceptable levels within habitable rooms. Appropriate specifications for noise levels from the MVHR system (operating at typical maximum duty) would be as follows:

- Bedrooms and living rooms – NR25 at 1.5m from any ventilation aperture; and,
- Other habitable areas – NR30 LAeq,T at 1.5m from any ventilation aperture.

- 4.21 Calculations were carried out using façade modelling software in accordance with the methodology given in BS8233:2014 to calculate the sound insulation performance required of the glazing and ventilation to achieve the nominated internal noise criteria in the ‘worst-case’ habitable rooms of the development facing Caversham Road (i.e. the habitable rooms that will be subject to the highest external noise levels). The calculations included a 3 dBA design margin.
- 4.22 If acceptable internal noise levels can be achieved in ‘worst case’ habitable rooms then it follows that acceptable internal noise levels can be achieved in all other habitable rooms of the development using similar glazing and ventilator types.
- 4.23 The calculations were carried out based on the following typical dimensions and details for facade elements:
- Glazing – 1.5m² for bedrooms and 2m² for living rooms; and
 - External walls – 8m² for bedrooms and 15m² for living rooms.
- 4.24 The results of the calculations are shown in Appendix 3 and are summarised in Table 2 below.

Table 2 Acoustic Requirements for ‘Worst Case’ Habitable Rooms

‘Worst Case’ Rooms	Glazing Performance Requirements (inc. Frames)	Ventilator Performance Requirements
Bedrooms and living rooms (2300-0700hrs)	39 dB Rw+Ctr	MVHR

Note The requirements given are approximate only and should be confirmed at the detailed design stage when full design details are available.

- 4.25 The required sound insulation performance values in Table 2 could typically be achieved by the glazing types shown in Table 3.

Table 3 Typical Glazing Acoustic Performances

Glazing (in Good Quality Sealed Frames)	Typical Weighted Sound Reduction (Rw + Ctr)
8.8mm/16/4mm acoustically upgraded thermal double glazing	33

- 4.26 It can be seen from the above that acceptable internal noise levels will be achievable in the development subject to the specification of suitable glazing and ventilation systems at the detailed design stage (which could be secured with a suitable planning condition). It is our view therefore that the proposed development is, in principle, acceptable with regards to the noise levels that will exist within the habitable rooms.

- 4.27 It will be possible to use lower acoustic performance façade elements for façades that are further from or acoustically screened from the surrounding noise sources, for example; the facades of the development facing away from Caversham Road. This can be investigated further at the detailed design stage.
- 4.28 It should be noted that the above assessment is based on windows being closed whereas the ProPG guidance suggests that internal noise levels should also be assessed with windows in the open position, which will likely be required at times to control overheating. Measures to control overheating should be implemented for facades subject to higher noise levels (i.e. those facing Caversham Road) to minimise the reliance on openable windows for thermal comfort. In this case we expect that appropriate treatments will include low g-value glazing, appropriately sized opening in windows and, if required, enhanced mechanical ventilation (e.g. overheating boost modes). This can be assessed further at the detailed design stage when full details of the construction of the development will be available and a full overheating assessment can be carried out. This could be controlled by the Council through the imposition of a planning condition and would not normally be a barrier for granting planning permission.

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

- 4.29 BS8233 states that it is desirable that noise levels in external amenity areas of residential developments do not exceed 50 dB LAeq and that 55 dB LAeq,T should be regarded as a upper guideline value. BS8233 recognises however that these guideline values will not always be achievable in city centres or urban areas adjoining main roads or other transport sources. In these cases, BS8233 states that the development should be designed to achieve the lowest practical noise levels in the amenity spaces.
- 4.30 Based on the results of the noise survey, noise levels on upper floor external amenity areas on the northern and eastern façade would be expected to exceed the BS8233 recommended levels. However, whilst this is not ideal, in our view, exceeding the BS8233 recommended levels does not normally mean that these areas would be unacceptable to future residents.
- 4.31 Balconies on the northern façade would be subject to similar noise levels to balconies on the recent adjacent development, Lion Court, where which noise levels would exceed BS8233 'desirable' levels. This is the case for most developments in urban areas¹.
- 4.32 For both balconies and terraces, it is reasonable to assume that residents would prefer the option to have a noisier private external amenity area as opposed to having no private external amenity area at all.
- 4.33 As terraces may be intended for outdoor relaxation in a higher capacity than that of balconies, it is important to consider protecting these areas. As such, the terraces will have solid balustrades, which will reduce the road traffic noise levels as far as is practicable in line with BS8233 guidance.

¹ Table 2 from BS8233 notes that daytime noise levels will typically exceed 50-55 dB LAeq,16hr in areas close to busy main roads. It was also found in the UK National Noise Incidence Study 2000/2001 that 90% of UK homes were exposed to daytime noise levels >50dB LAeq,16hr and 54% of UK homes were exposed to noise >55dB LAeq,16hr. It is reasonable to assume that a high percentage of these were in urban areas.

- 4.34 In addition, all residents will have use of the ground floor communal landscaped amenity garden which is positioned behind the building where the noise levels will be in line with the BS8233 guidelines.
- 4.35 The current design of the development is therefore considered to be acceptable in relation to noise levels in external amenity areas.

Stage 2 – Element 4 – Other relevant issues

- 4.36 In our view the design and acoustic approach outlined above is in line with both local and national noise policy. It is common for residential properties to be situated near to main roads, as demonstrated by the new residential development known as Lion Court which adjacent to the site. This is an acceptable scenario provided that the properties are acoustically upgraded where necessary to achieve acceptable noise levels in habitable areas.

Recommendation to decision maker

- 4.37 It is our view that planning permission should be granted in relation to noise affecting habitable areas of the development subject to the imposition of suitable planning conditions to ensure that acceptable noise levels are achieved in the finished development.

5. CONCLUSIONS

- 5.1 Cass Allen was instructed by Elstree Land Ltd to assess the suitability of the site for the proposed development with regards to noise.
- 5.2 The assessment was carried out in accordance with relevant local and national planning guidance.
- 5.3 A noise survey was carried out at the site. Noise levels at the site are dictated by road traffic noise emissions from Caversham Road and, to a lesser extent; Great Knollys Street.
- 5.4 Noise affecting the development has been assessed in accordance with the ProPG guidance. The design of the development is considered to be acceptable subject to the adoption of acoustically upgraded glazing and mechanical ventilation for habitable rooms subject to higher noise levels. This can be investigated further at the detailed design stage.
- 5.5 In summary of the above it is our view that the site is suitable for the development in terms of noise levels and that planning permission should be granted subject to the imposition of suitable planning conditions.

Appendix 1 Site Plan

Copyright © 2018 DPA Associates, LLC. All rights reserved. Limited reproduction and distribution permitted for the use of this plan in the presentation of this project only. This plan is not to be used for any other purpose without the written consent of DPA Associates, LLC. Do not scale other than for local utility planning purposes.

Presentation Layout

- 1 Buildings now separated with space between accommodating a secondary entrance to amenity space
- 2 Steps and ramped leveled access to principle front entrances
- 3 Upper floors set back from main building facade allowing for amenity terraces
- 4 Landscaped frontage with feature railings and scotch tree planting
- 5 Landscaped amenity garden
- 6 South facing walk out balconies



appraisal layout

Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by road traffic on surrounding roads.

Survey Period:

19/06/2020 to 23/06/2020

Survey Objectives:

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

Equipment Used (Appendix 2, Table 1):

Type	Manufacturer	Model	Serial Number
Sound level meter ¹	Rion	NL-52	00965090
Calibrator	Rion	NC-74	34551703
Sound level meter ¹ (noise logger)	Rion	NL-32	01182950

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring. Any periods of unattended monitoring that may have been adversely affected by weather conditions have been excluded from the data analysis.

Measurement Positions (Appendix 2, Table 2):

Position (refer plan below)	Description
N1	Attended noise monitoring position. 1.3m above ground. Free-field. Direct line of sight to Great Knollys Street and Caversham Road.
N2	
N3	Attended noise monitoring position. 1.3m above ground. Free-field. Direct line of sight to Caversham Road.
N4	
L1	Unattended noise logging position. 1.5m above ground level. Free-field. Direct line of sight to Caversham Road.

Site Plan showing Measurement Positions (Appendix 2, Figure 4):



Attended Noise Monitoring Results (Appendix 2, Table 3):

Date	Position	Time	Meas. Length	LAeq, dB	LAmix, dB	LA90, dB	Observations
19/06/2020	N1	10:55	5 mins	61	71	55	Noise dictated by road traffic from Caversham Road
		11:00		67	87	54	
	N2	11:05	13 secs	71	73	69	Noise dictated by activities associated with Thimbleby & Shotland Auction Centre and Farmers Market
		11:05	5 secs	73	75	71	
		11:06	4 secs	71	73	66	
		11:07	6 secs	71	74	70	
	N3	11:11	10 secs	76	83	70	
		11:12	11 secs	72	77	70	
		11:12	8 secs	76	79	74	
		11:13	7 secs	75	79	72	
		11:14	12 secs	73	78	67	
		11:15	5 mins	74	87	64	
	N4	11:25		74	85	67	
	N1	11:37	9 secs	61	63	60	
		11:38	6 secs	56	61	53	

Attended Noise Monitoring Results (Appendix 2, Table 3):

Date	Position	Time	Meas. Length	LAeq, dB	LAmix, dB	LA90, dB	Observations
		11:39	5 secs	53	55	52	
		11:45	5 mins	61	71	51	
	N3	12:12		66	83	54	
		12:21	6 secs	77	82	73	
		12:22	5 secs	75	78	71	
		12:25	5 mins	74	83	65	

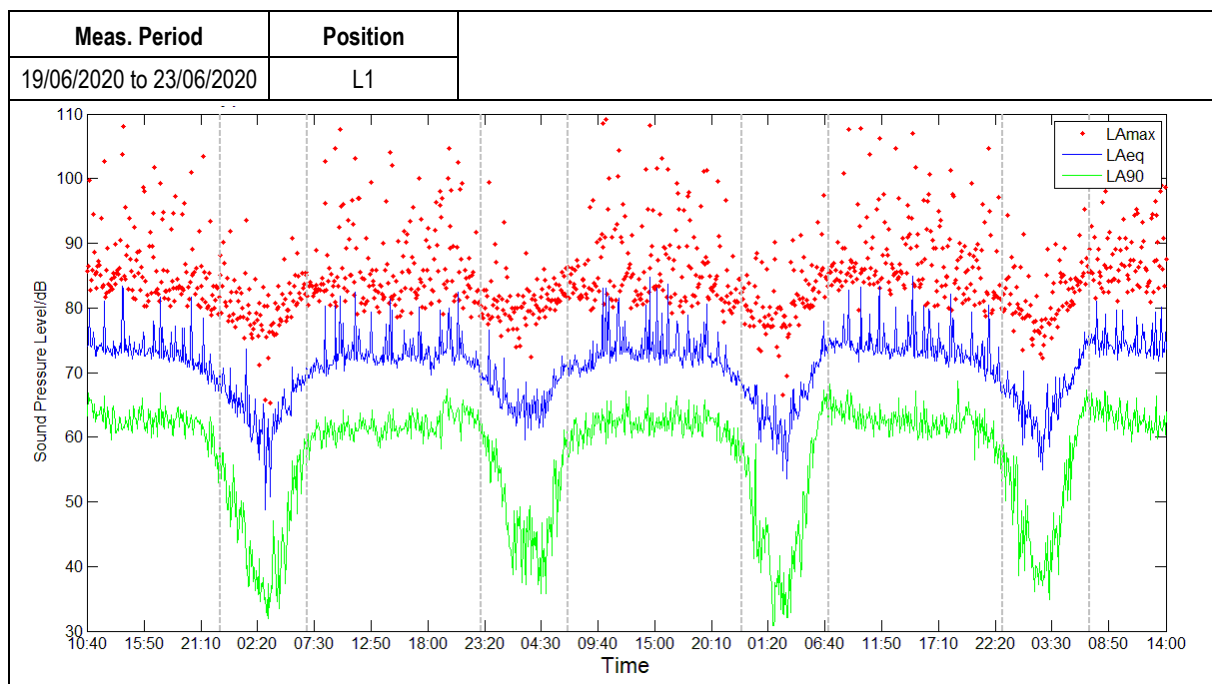
Unattended Noise Monitoring Results (Appendix 2, Table 4):

Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)		
		LAeq,16hr, dB	LA90,1hr dB ¹	LAeq,8hr, dB	LA90,5mins, dB ¹	LAmix, dB ²
19/06/2020 to 23/06/2020	L1	75	61	67	48	85-86

Note 1: Typical lowest measured during the period shown.

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

Unattended Noise Monitoring Results (Appendix 2, Figure 5):



Appendix 3 Facade Calculations

CLIENT: Elstree Land Ltd

PROJECT: 45 Caversham Road, Reading

ROOM: Bedroom

RUN REF: Daytime

VARIANT: Laeq 0700-2300

Room Dimensions [m]

W3.0

L4.0

X2.4

Room Volume = 28.8 m3

Partition Area = 9.5 m2

Ventilation ref area = 10.0 m2

Free Field SPL K = 3 dB

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

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	75.0							
	56.8	60.9	64.4	67.8	71.0	68.2	63.0	Reference spectrum

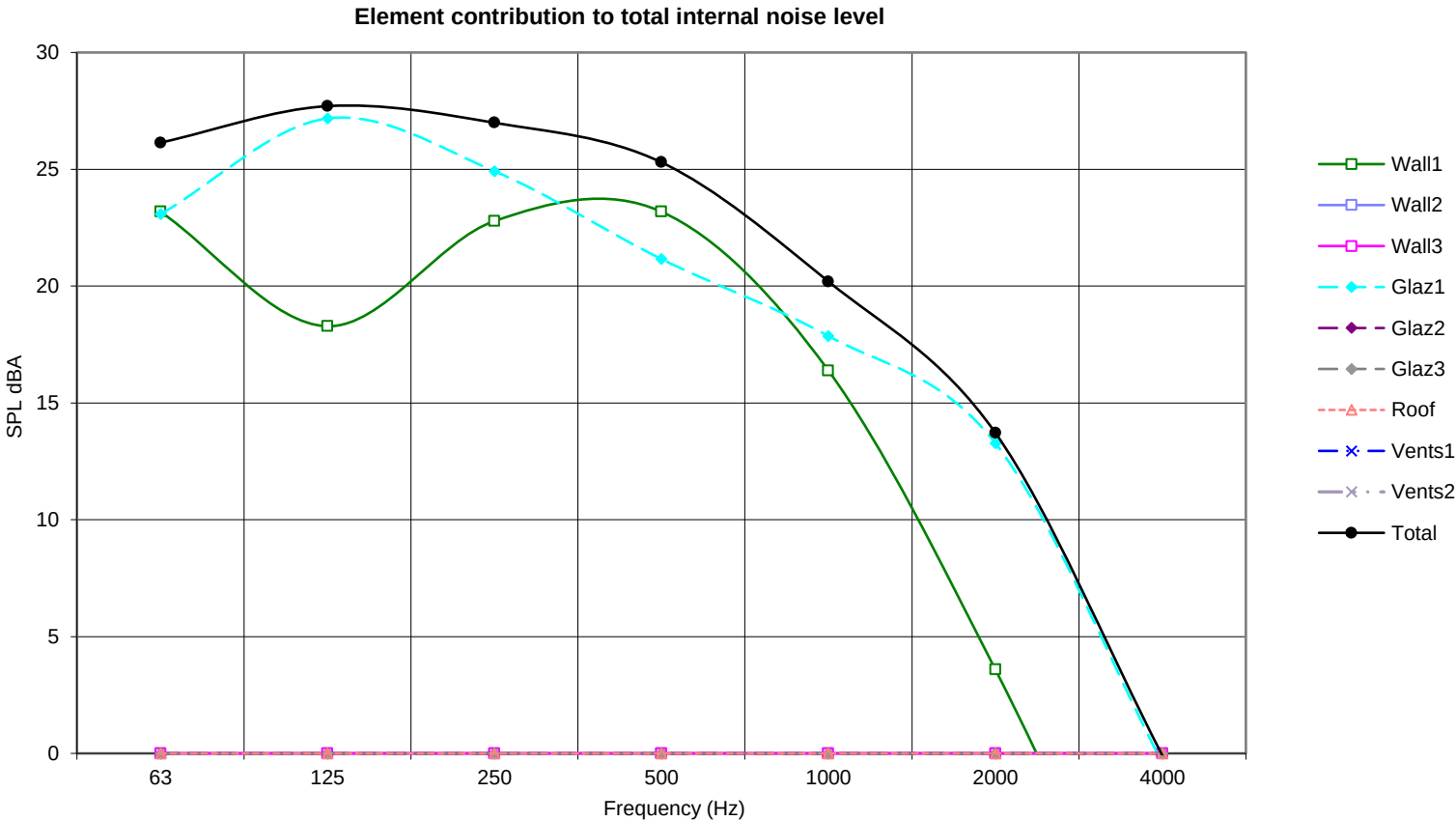
REVERBERATION TIME

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

NOTES:

Façade Element			Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	▼	8.0	36	45	44	47	57	67	77	36%	54	0	-4
	ATTENUATION													
Wall 2	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Wall 3	WALLS	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	▼	1.5	29	29	35	42	48	50	59	63%	39 (inc Ctr)	-	-
	ATTENUATION													
Glazing 2	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Glazing 3	GLAZING	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Roof	ROOF / FLOOR	▼		0	0	0	0	0	0	0	0%			
	ATTENUATION													
Resultant composite Façade SRI				34	36	41	46	54	58	66				
Resultant SPL inside room excluding ventilators dB			32.9	26	28	27	25	20	14	0	100%			

Ventilator Type			Num	D _{n,e} dB to BS EN 20140-10:1992									Dnew	C	Ctr
Ventilation		▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Ventilation	VENTS	▼		0	0	0	0	0	0	0	0%				
	ATTENUATION														
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%				
Total SPL inside room			32.9	26	28	27	25	20	14	0					



CLIENT:

PROJECT:

ROOM:

RUN REF:

VARIANT:

Elstree Land Ltd

45 Caversham Road, Reading

Bedroom

Night-time

Laeq 2300-0700

Room Dimensions [m]

W

3.0

L

4.0

H

2.4

X

Room Volume =

28.8

m3

Partition Area =

9.5

m2

Ventilation ref area =

10.0

m2

Free Field SPL

K =

3

dB

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

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	67.0							
	48.8	52.9	56.4	59.8	63.0	60.2	55.0	Reference spectrum

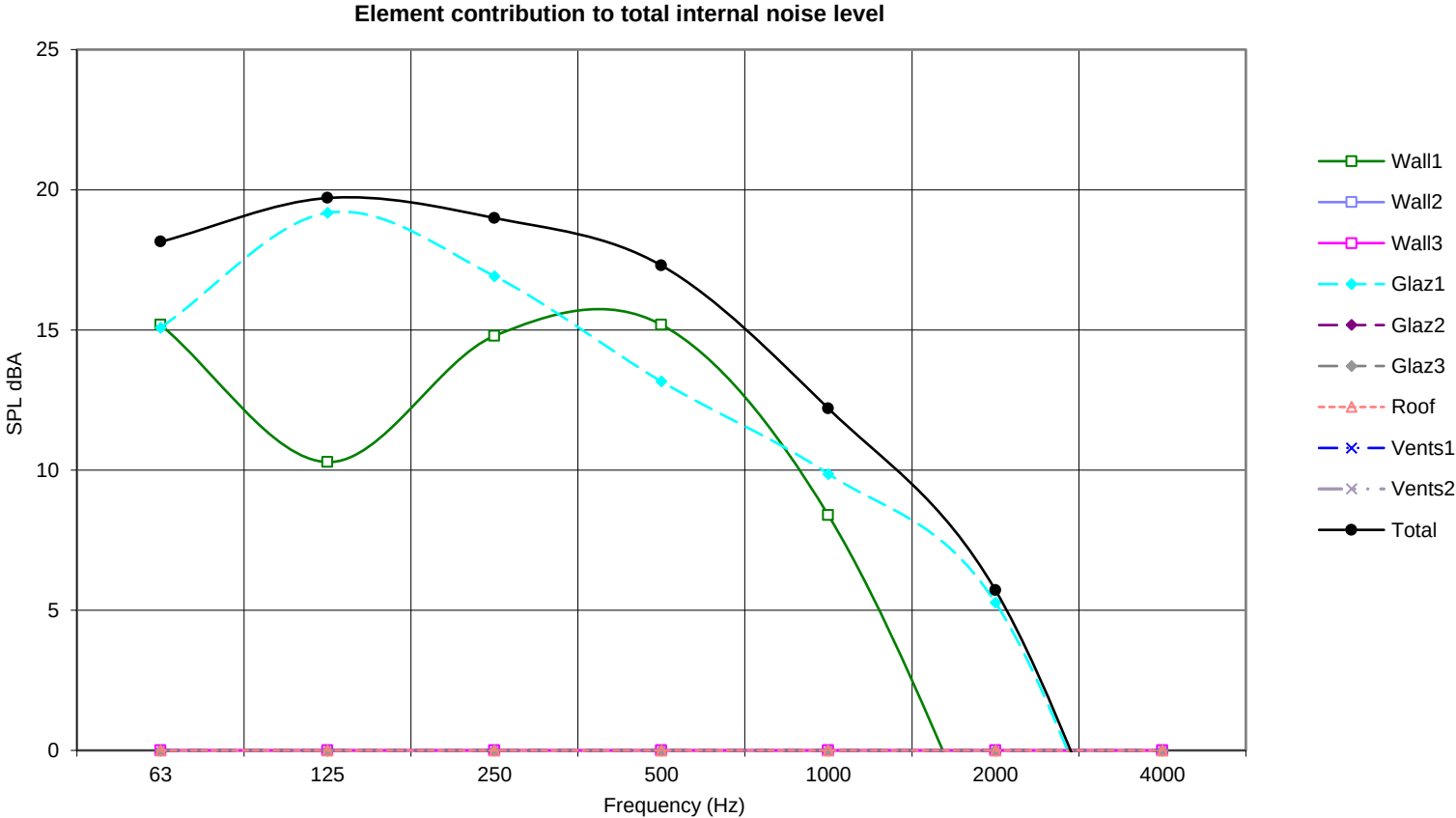
REVERBERATION TIME

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

NOTES:

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	36%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	1.5	29	29	35	42	48	50	59	62%	39 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant composite Façade SRI			34	36	41	46	54	58	66				
Resultant SPL inside room excluding ventilators dB			24.9	18	20	19	17	12	6	-8	100%		

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			24.9	18	20	19	17	12	6	-8			



CLIENT:

PROJECT:

ROOM:

RUN REF:

VARIANT:

Elstree Land Ltd

45 Caversham Road, Reading

Bedroom

Night-time Max

Laeq 2300-0700

Room Dimensions [m]

W

3.0

L

4.0

H

2.4

X

Room Volume =

28.8

m3

Partition Area =

9.5

m2

Ventilation ref area =

10.0

m2

Free Field SPL K =

3

dB

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

EXTERNAL SPECTRUM (A weighted)

Direct input - Free Field SPL (A weighted octave bands) dB ---->	86.0	57.2	66.4	75.6	81.2	82.1	76.4	72.6
Road traffic spectrum (according to BS 8233:1999 section 6)								
		57.2	66.4	75.6	81.2	82.1	76.4	72.6

57.2 66.4 75.6 81.2 82.1 76.4 72.6 Direct input

REVERBERATION TIME

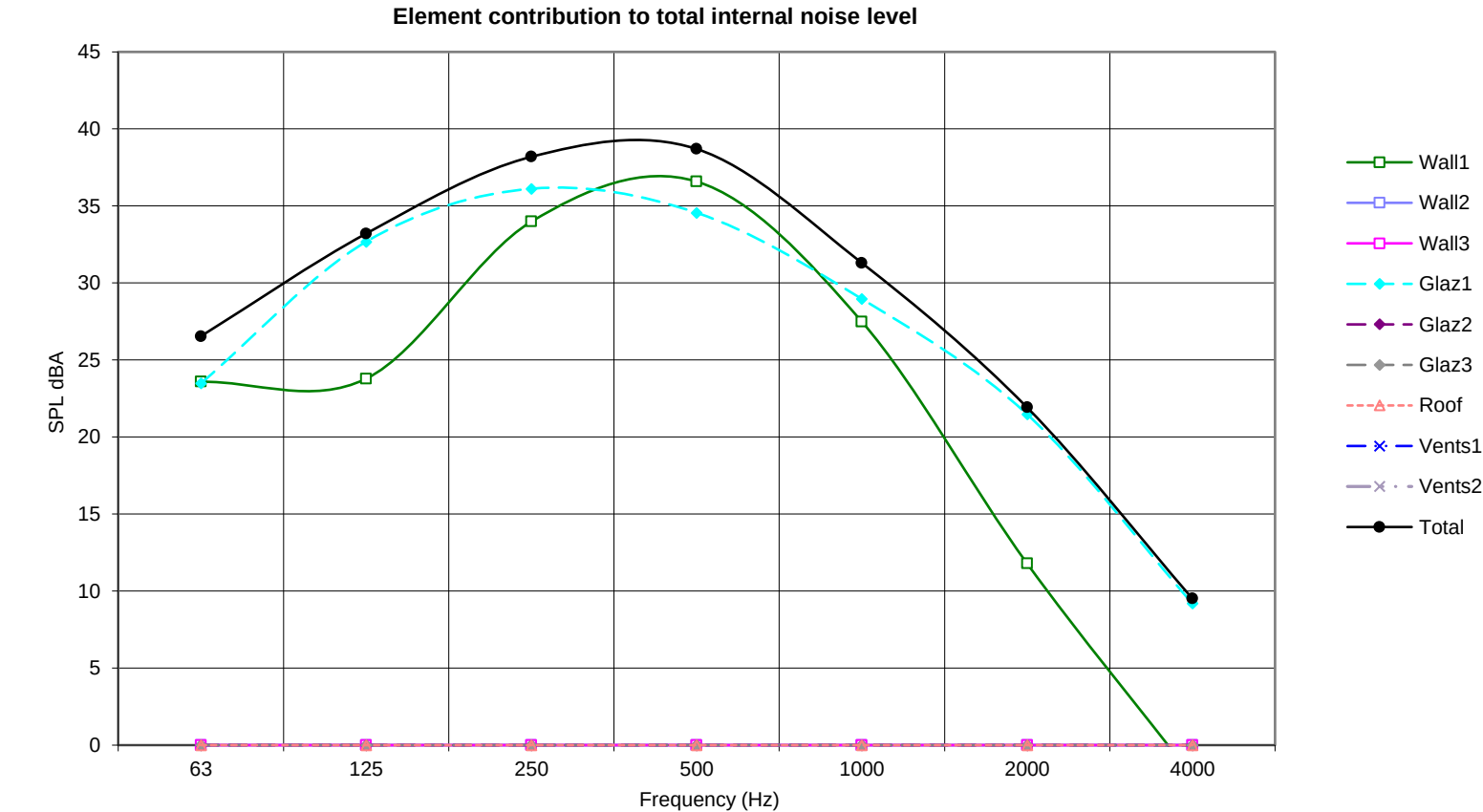
DIRECT INPUT ----->								No data
EQUAL RT for all bands ----->								

0.5 0.5 0.5 0.5 0.5 0.5 0.5 Default - RT set to 0.5s

NOTES:

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	8.0	36	45	44	47	57	67	77	45%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	1.5	29	29	35	42	48	50	59	55%	39 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant composite Façade SRI			34	36	41	46	54	58	66				
Resultant SPL inside room excluding ventilators dB			42.6	27	33	38	39	31	22	10	100%		

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			42.6	27	33	38	39	31	22	10			



CLIENT:

PROJECT:

ROOM:

RUN REF:

VARIANT:

Elstree Land Ltd

45 Caversham Road, Reading

Living Room

Daytime

Laeq 0700-2300

Room Dimensions [m]

W

4.0

X

L

5.0

X

H

2.4

Room Volume =

48.0

m3

Partition Area =

17.0

m2

Ventilation ref area =

10.0

m2

Free Field SPL K =

3

dB

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

EXTERNAL SPECTRUM (A weighted)

dBA	63	125	250	500	1000	2000	4000	
Direct input - Free Field SPL (A weighted octave bands) dB ----->	-							No data
Road traffic spectrum (according to BS 8233:1999 section 6)	75.0							
	56.8	60.9	64.4	67.8	71.0	68.2	63.0	Reference spectrum

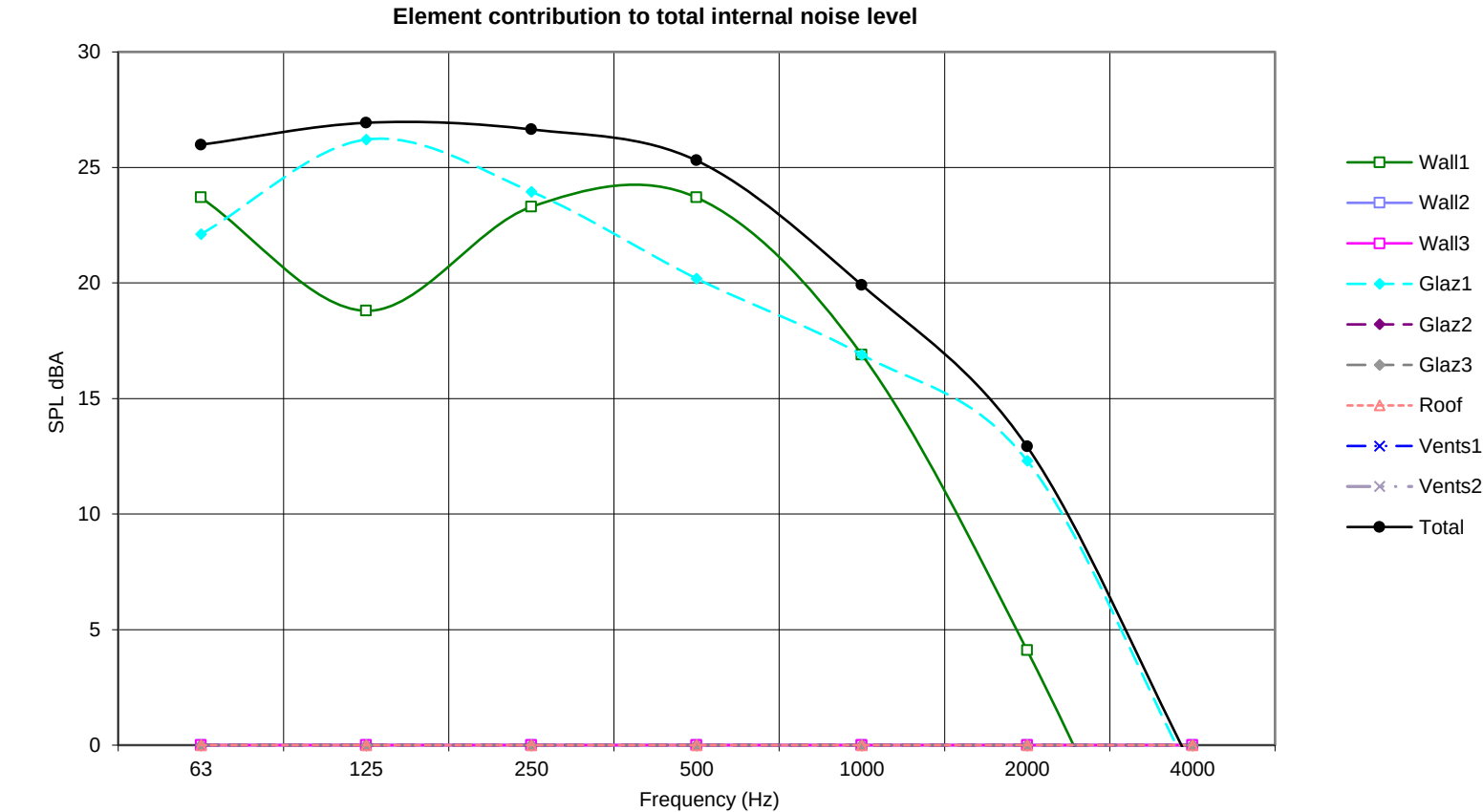
REVERBERATION TIME

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

NOTES:

Façade Element		Area [m2]	SRI dB to BS EN ISO 140-3:1995								Rw	C	Ctr
Wall 1	Typical - 102mm brick/50mm cavity/100mm block	15.0	36	45	44	47	57	67	77	45%	54	0	-4
	ATTENUATION												
Wall 2	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Wall 3	WALLS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 1	39 dB Rw + Ctr - Very High Performance Double Glazing	2.0	29	29	35	42	48	50	59	55%	39 (inc Ctr)	-	-
	ATTENUATION												
Glazing 2	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Glazing 3	GLAZING		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Roof	ROOF / FLOOR		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant composite Façade SRI			34	37	41	46	55	59	67				
Resultant SPL inside room excluding ventilators dB			32.6	26	27	27	25	20	13	-1	100%		

Ventilator Type		Num	D _{n,e} dB to BS EN 20140-10:1992								Dnew	C	Ctr
Ventilation			0	0	0	0	0	0	0	0%			
	ATTENUATION												
Ventilation	VENTS		0	0	0	0	0	0	0	0%			
	ATTENUATION												
Resultant SPL inside room through ventilators dB			-99.0	-96	-96	-96	-96	-96	-96	-96	0%		
Total SPL inside room			32.6	26	27	27	25	20	13	-1			





Architectural & Environmental Acousticians Noise & Vibration Engineers

This report has been prepared by Cass Allen Associates Ltd in accordance with the CDM regulations with all reasonable skill, care and diligence, and taking account of the resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid at the time of collection. This report is for the exclusive use of the client named above; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from Cass Allen Associates Ltd. Cass Allen Associates Ltd disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of work.



If you have any queries
with this report, please
[click here to send us an
email](#) and we will call you
back to discuss