

EXTERNAL NOISE ASSESSMENT
REVISION 1

CLIENT

Ravenswood Holdings
Riverside House
Upper Wharf
Fareham
Hampshire
PO16 0LY

SITE

Proposed Residential Development
Land Adjacent to
No.2 New Road
Havant
Hampshire

SURVEY DATE (S)

6th – 7th September 2007

Report By	
Mr. B. J. Scrivener MIOA.	

Sound Advice Acoustics Ltd
9 - 11 Hursley Road, Chandlers Ford, Hampshire, SO53 2FW
Tel: 0845 460 0003
soundadviceacoustics.co.uk

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ADDITIONAL INFORMATION

FIGURE 1 EXTERNAL NOISE LEVEL RESULTS FROM POSITION
1, 6TH – 7TH SEPTEMBER 2007

FIGURE 2 - 7 BS 8233: 1999 CALCULATION SHEETS

Introduction:

Sound Advice Acoustics Ltd has been instructed by Ravenswood Holdings, to carry out the relevant noise assessments and calculations at the site in New Road, Havant. It is proposed that the existing waste land is to be redeveloped to include two new build flats.

With regards to external ambient noise, noise levels are to be monitored generally in accordance with Planning and Policy Guidance PPG 24 and assessments and calculation made in accordance with BS 8233: 1999 Sound Insulation and Noise Reduction for Buildings Code of Practice. The levels recorded are to be used to evaluate the NEC Category in accordance with PPG 24 and the minimum window specification required for the proposed development.

It should be noted that the National Planning Policy Framework 2012 came into force in March 2012 and as a result Planning and Policy Guidance PPG 24 has been withdrawn. However, in the absence of the council's own policy document, it was agreed with the Environmental Health Department that for this particular site PPG 24 could be used as a suitable means reference of noise levels.

External noise levels are to be recorded over, what has been considered for the site, an average / typical time period in order to assess the highest daytime and night time averages and therefore assess worse case scenario.

In addition, calculations are to be made for the predicted daytime noise levels within the outdoor living area and assessments made against the recommended levels within the World Health Organisation's 'Guidelines for Community Noise'.

The prediction software CADNA is to be used for this assessment in order to ascertain the precise noise levels and relevant PPG 24 noise categories for each residential window.

DAYTIME EXISTING



NIGHT TIME EXISTING



The above screen shot is taken from the CADNA 3D acoustic computer modelling software. This software has been used to generate a working model that replicates the recorded $L_{Aeq\ 16\ HOUR}$ 63.3 dB daytime and night time $L_{Aeq\ 8\ HOUR}$ 56.3 dB noise level at the measurement position 1.

From this, further calculations and assessment can be made to generate both the predicted noise levels at the facades of the proposed development and within the external living area.

This assessment has been carried out using the previously recorded noise data with the revised plan layout.

Procedure:

External noise levels were recorded over typical weekday periods including 6th – 7th September 2007 at position 1 as detailed on the attached plan sketch layout. Sample measurements were recorded over continuous 5 minute samples and from this data the hourly LAeq daytime values have been evaluated. Sound Pressure Levels were recorded on the following setting along with a full octave band frequency analysis measured simultaneously and between 31.5 Hz and 16.0 kHz.

Daytime 07:00 – 23:00

Night Time 23:00 – 07:00

L _{Aeq} 1 HOUR dB	L _{A10} 1 HOUR dB	L _{Aeq} 5 MINUTES dB	L _{A10} 5 MINUTES dB
L _{AMAX} 1 HOUR dB	L _{A50} 1 HOUR dB	L _{AMAX} 5 MINUTES dB	L _{A50} 5 MINUTES dB
L _{AMIN} 1 HOUR dB	L _{A90} 1 HOUR dB	L _{AMIN} 5 MINUTES dB	L _{A90} 5 MINUTES dB

The external results recorded were assessed in accordance with Planning and Policy Guidance PPG 24. Calculations have also been made in accordance with BS 8233: 1999 'Sound Insulation and Reduction of Buildings - Code of Practice'. Recommendations were made for any additional acoustics measures to conform to these standards.

From the downloaded recorded results both the daytime and night time averages for the 24 hour period were assessed and used within the above calculations as L_{Aeq} 16 HOUR dB levels for daytime and L_{Aeq} 8 HOUR dB for night time. These are detailed on the attached figure 1.

Apparatus:

The above equipment was calibrated using a sound pressure level of 114.0 dB at an octave band centre frequency of 1000Hz with reference to $2 \times 10^{-5} \text{ Nm}^{-2}$ before and after the tests and the equipment set to have no inaccuracy greater than 0.2 dB.

All the following equipment was calibrated in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS) on the following dates. Calibration schedules are implemented within Sound Advice Acoustics Ltd in accordance with UKAS directive LAB 23.

Calibration schedules are implemented within Sound Advice Acoustics Ltd in accordance with UKAS directive LAB 23.

Description	Make	Type	Serial No.	Calibration Intervals	Last Calibrated	Next Due Calibration
Integrated Sound Level Meter	Norsonic	118	28191	2 YEARS	17.04.07	16.04.09
12.5mm Microphone (with windshield)	GRAS	40AF	73337	2 YEARS	17.04.07	16.04.09
Microphone Pre – Amplifier	Norsonic	1206	27587	2 YEARS	17.04.07	16.04.09
Calibrator	Norsonic	1251	31963	1 YEAR	25.07.07	24.07.08

Environmental Conditions:

START OF TEST - 6th September 2007

Temperature: 17⁰ C
Relative Humidity 62%
Average Wind Speed: <0.5 m/s
Cloud Cover: Moderate
Road Surface Dry
Atmospheric Pressure: 1004

END OF TEST - 7th September 2007

Temperature: 19⁰ C
Relative Humidity 82%
Average Wind Speed: <0.5 m/s
Cloud Cover: Moderate/Heavy
Road Surface Damp
Atmospheric Pressure: 1001

* Wind speed, temperature and relative humidity were all recorded using standard equipment supplied by RS Components, Hedge End, Southampton and are taken as an average over the designated time period.

Results:

- $L_{Aeq,t}$ - The equivalent A weighted sound pressure level recorded over a time interval of 5 minutes night time and 1 hourly daytime.
- $L_{A90,t}$ - The A weighted sound pressure level that is exceeded for 90% of the time period 5 minutes night time and 1 hourly daytime.
- $L_{A50,t}$ - The A weighted sound pressure level that is exceeded for 50% of the time period 5 minutes night time and 1 hourly daytime.
- $L_{A10,t}$ - The A weighted sound pressure level that is exceeded for 10% of the time period 5 minutes night time and 1 hourly daytime.
- L_{Amax} - The maximum A weighted sound pressure level recorded over a time interval of 5 minutes night time and 1 hourly daytime.
- L_{Amin} - The minimum A weighted sound pressure level recorded over a time interval of 5 minutes night time and 1 hourly daytime.

See attached Figure 1 for full downloaded results, and averages.

6 th – 7 th September 2007 - Position 1																
Date / Time	LAeq	Lmax	Lmin	LA10	LA50	LA90	Octave Band Centre Frequency (Hz)									
							31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME LOWEST	59.6	75.8	38.1	59.4	51.2	42.2	57.3	62.0	57.4	54.5	55.5	55.3	50.1	47.3	53.1	43.0
DAYTIME HIGHEST	68.2	91.3	51.4	61.5	57.9	53.7	64.5	67.6	60.7	67.1	66.8	62.4	56.2	53.2	47.8	42.0
DAYTIME AVERAGE	63.3	82.2	48.4	62.6	56.9	51.8	63.6	66.7	60.5	60.6	59.8	59.2	54.8	53.1	52.6	45.8
NIGHT TIME LOWEST	38.4	51.9	26.4	41.3	31.4	28.0	42.9	45.2	42.6	36.3	36.7	34.7	26.7	18.4	17.7	19.5
NIGHT TIME HIGHEST	65.0	80.8	36.9	67.1	48.4	39.6	59.5	65.0	61.6	59.0	61.0	60.1	56.4	55.2	57.1	48.2
NIGHT TIME AVERAGE	56.3	72.3	35.9	57.5	46.6	38.7	56.6	59.6	53.9	51.2	53.2	52.5	47.4	44.2	42.1	33.2

Discussion of Results:

It can be seen from the attached graph and downloaded results that the external noise levels have followed the expected path and remained fairly constant throughout the day. The levels then gradually dropped off as the evening progressed and began to rise when morning traffic levels increased.

With regards to maximum levels, PPG 24 states that

“Night-time noise levels (23:00 – 07:00): sites where individual noise events regularly exceed 82 dB L_{Amax} (S time weighting) several times in any hour should be treated as being in NEC C, regardless of the $L_{Aeq,8h}$ (except where the $L_{Aeq,8h}$ already puts the site in NEC D).”

It can be seen from the downloaded data that the L_{max} limit of 82 dB has not been exceeded during the night time period. Therefore the above statement from PPG 24 does not come into force and the PPG 24 categories remain as evaluated as per the following CADNA A calculations.

Noise Exposure Categories:

The following noise exposure categories have been assessed in accordance with Planning Policy Guidance Planning and Noise PPG 24 and assessed to the nearest affected façade of the proposed residential dwelling:-

The following assessments are made at the position of the highest calculated proposed façade with regards to average noise levels over their representative time periods for daytime and night time.

AVERAGE LEVELS 6th – 7th September 2007

Daytime	-	Average Level $L_{Aeq, 16 \text{ HOUR}}$ (07:00 – 23:00 hrs)	63.3 dB
		Noise Exposure Category C	($L_{Aeq, 16 \text{ HOUR}}$ 63 - 72 dB)
Night Time	-	Average Level $L_{Aeq, 8 \text{ HOUR}}$ (23:00 – 07:00 hrs)	56.3 dB
		Noise Exposure Category B	($L_{Aeq, 8 \text{ HOUR}}$ 45 - 57 dB)

All categories relate to traffic and mixed noise sources, and the results are corrected to the nearest decibel.

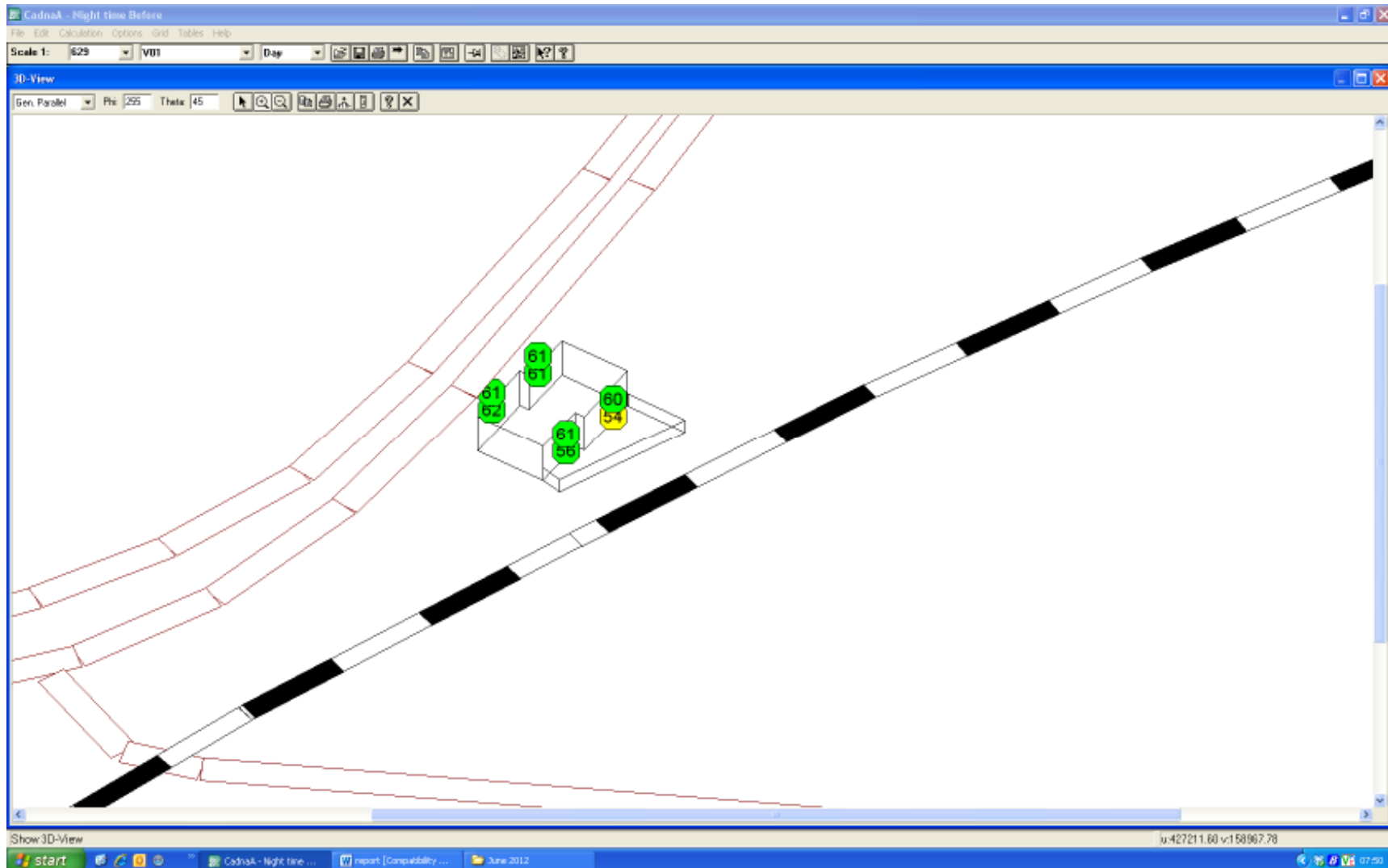
However, guidance should be taken from the CAD-01 & CAD-02 predictions shown on pages 11 – 14 of this report. CAD-01 illustrates daytime noise levels and CAD-02 night time levels. The following colour chart has been illustrated on the printouts.

YELLOW	-	NEC CATEGORY	A
GREEN	-	NEC CATEGORY	B
BLUE	-	NEC CATEGORY	C
RED	-	NEC CATEGORY	D

DAYTIME NOISE LEVELS – (CAD-01)



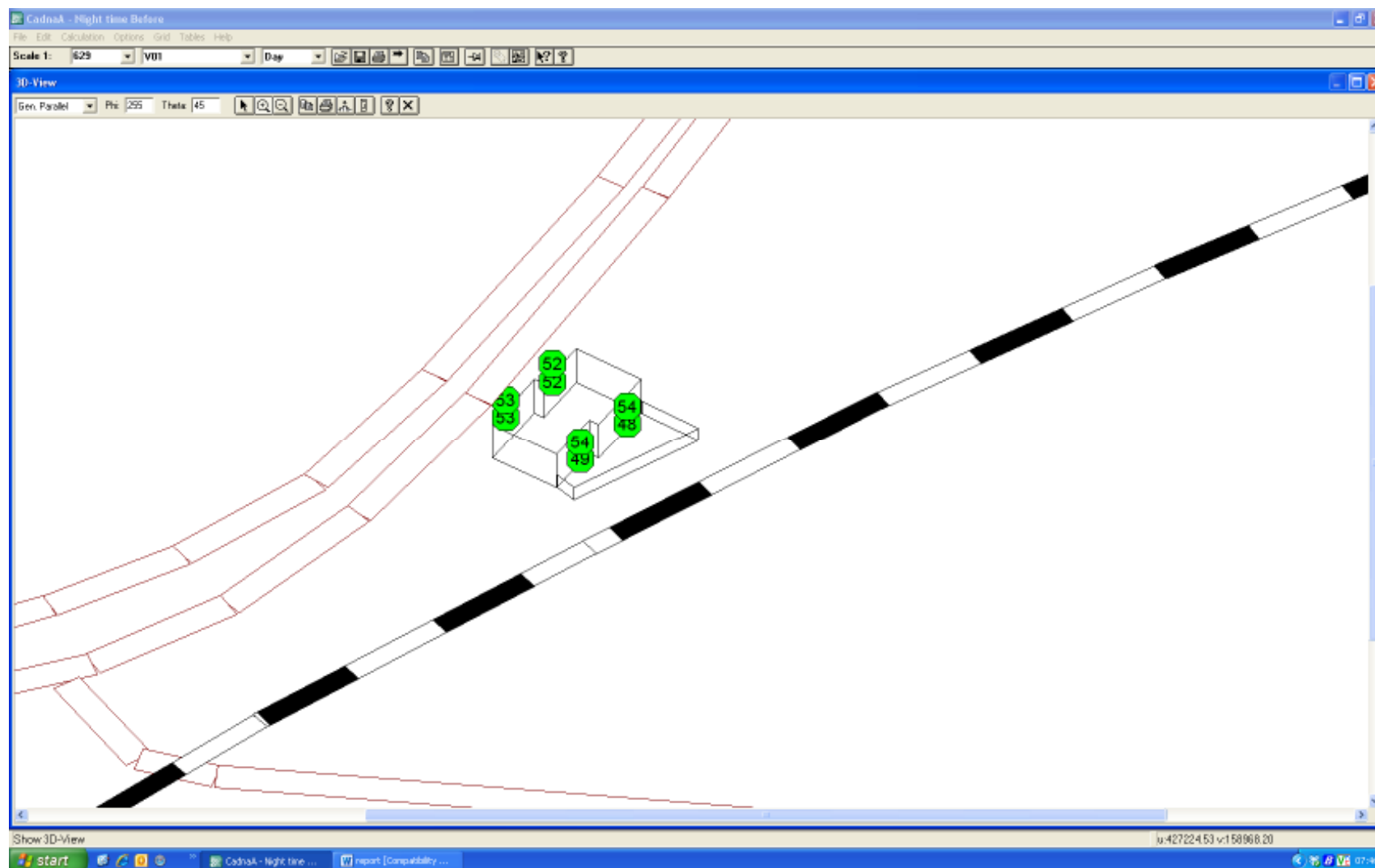
3D DAYTIME NOISE LEVELS



NIGHT TIME NOISE LEVELS - (CAD-02)



3D NIGHT TIME NOISE LEVELS



Recommendations:

The above noise tests have been assessed in accordance with PPG 24 and category C evaluated for daytime and category B evaluated for night time for the front facades onto New Road.

It can be seen from the category results that the site and surrounding areas, whilst close to a major road (A27), that this particular site is a quieter site than most and therefore ideal for residential development.

PPG 24 introduces the concept of Noise Exposure Categories (NECs) for residential developments; these are classified as shown in Table 1. The noise level corresponding to the noise exposure categories for new housing are given in Table 2.

Policy Planning Guidance PPG 24 states within Annex 1 that for NEC category C:-

NEC C	Planning Permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
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Policy Planning Guidance PPG 24 states within Annex 1 that for NEC category B:-

NEC B	Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise.
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Table 1. Noise Exposure Categories

Noise Source	NEC A dB L _{Aeq}	NEC B dB L _{Aeq}	NEC C dB L _{Aeq}	NEC D dB L _{Aeq}
Mixed				
07:00 to 23:00 hrs	<55	55-63	63-72	>72
23:00 to 07:00 hrs	<45	45-57	57-66	>66

Table 2. Extract from PPG 24

Therefore in order to achieve the required reasonable noise levels of L_{Aeq} 35 dB for habitable rooms and L_{Aeq} 30 for Bedroom at night within the proposed residential properties, the following additional acoustic measures have been calculated. (Details on calculation sheets figure's 2 – 7 inclusive).

It should be noted that the calculations have been made with the proposed windows closed. Additional calculations were made for the top floor due to the influence of sound transmission into the various rooms via the roof / ceiling i.e. an increased impeding façade.

MINIMUM CONSTRUCTION DETAILS

STANDARD WALL CONSTRUCTION

Brick Outer face, cavity, inner brick or block system.

125	250	500	1.0k	2.0k	4.0k	Frequency (Hz)
40.0	44.0	45.0	51.0	56.0	56.0	dB reduction

WINDOW CONSTRUCTION (4 / 14 / 6)

125	250	500	1.0k	2.0k	4.0k	Frequency (Hz)
24.4	26.5	36.2	41.7	40.3	42.6	dB reduction

TRICKLE VENTS

	125	250	500	1.0k	2.0k	4.0k	Frequency (Hz)
Standard slot vent	33.0	32.0	29.0	29.0	31.0	30.0	dB reduction
Acoustic slot vent	40.0	38.0	37.0	34.0	37.0	38.0	dB reduction

ROOF CONSTRUCTION – MINIMUM VALUE

125	250	500	1.0k	2.0k	4.0k	Frequency (Hz)
28.0	34.0	40.0	45.0	49.0	53.0	dB reduction

The above calculations from the CADNA A software and the attached figures 2 – 7 from the BS 8233 : 1999 calculations demonstrate that the lounges and bedroom 1 on the proposed development can utilise a window specification of 4mm glass / 14mm air gap / 6mm glass with standard through frame slot vent. The minimum acoustic specifications for these are detailed within this report and an alternative product can be used provided the minimum acoustic attenuation values are equal to or in excess of those calculated.

The ground and first floor bedroom 2 should similarly utilise the same window specification although they should have the acoustic through frame slot vent fitted in place of standard trickle vents.

Outdoor Living Areas:

The World Health Organisation 'Guidelines for Community Noise gives guidance as to desirable noise levels that should be achieved within outdoor living areas such as gardens, patios and verandas etc.

Table 1: Guideline values for community noise in specific environments, details the desirable target noise levels within various areas.

Outdoor Living Area

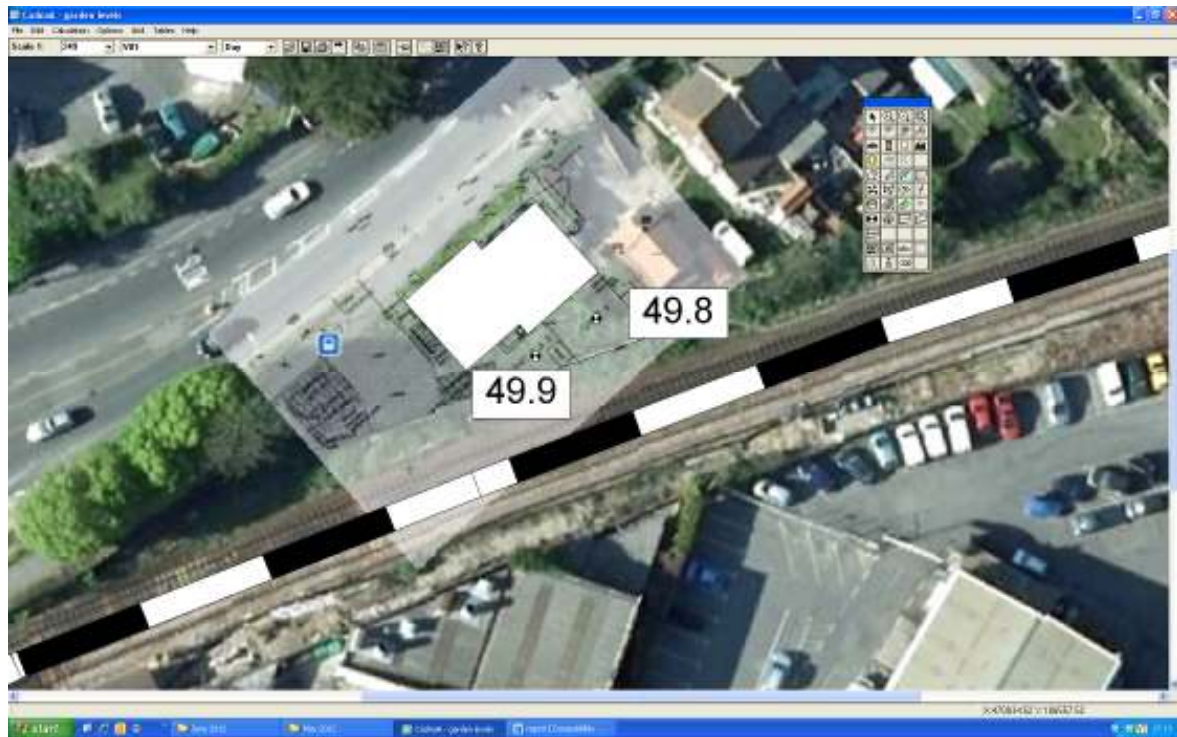
Serious Annoyance, daytime and evening	$L_{Aeq\ 16\ HOUR}$ 55 dB
Moderate Annoyance, daytime and evening	$L_{Aeq\ 16\ HOUR}$ 50 dB

It is demonstrated on the following CADNA A calculations that the predicted noise levels within the proposed development garden areas are likely to be below the $L_{Aeq\ 16\ HOUR}$ 50 dB lower limit.

However, it should be noted that the proposed development is in keeping with the existing environment of residential dwellings on New Lane.

The following calculation from the aforementioned 3D modelling software demonstrates that in order to meet the desired level of less than 50 dB(A) within the garden areas of plots, the fence height should be 2.0m high with a minimum density of 13 Kg/m² and be continuous with no gaps and continued to ground level with no gaps underneath.

CADNA A CALCULATION FOR EXTERNAL LIVING AREA NOISE LEVELS



Plan Sketch Layout:

Measurement Position No.1



Conclusion:

Levels have been recorded and assessments made in accordance with the relevant standards. Internal criteria's have been set and calculations made in order to determine the minimum construction details required in order to meet the desired level within the proposed residential dwellings and satisfy the local council's requirements.

It will be necessary to install a window specification of 4 / 14 / 6 double glazing to all aspects of the development with Greenwood S Slot Vents installed to the bedrooms and standard trickle vents to all other areas. Given the size of the development it may be beneficial to install the acoustic trickle vents to all aspects.

An assessment in accordance with the World Health Organisation's 'Guidelines for Community Noise' has also be carried out in order to calculate and demonstrate the predicted noise levels within the proposed external living areas. The calculations have concluded that it will be necessary to install a 2.0m high acoustic fence along the railway facing boundaries. These are detailed on page 20 of this report.

Finally an assessment using the CADNA software has confirmed the predicted noise levels at each of the proposed windows and the corresponding PPG 24 noise category. This report and subsequent calculations and assessments have demonstrated that mitigation measures can be introduced to the site in order to ensure compliance with BS 8233 : 1999 for predicted internal noise levels within dwellings and the WHO guidelines for community noise for external living areas.

With regards to PPG 24, the evaluated planning category of C should taking as guidance only as this document has now been withdrawn and suitable mitigation methods demonstrated within this report prove compliance with current legislations.

Therefore it is the the professional opinion of Sound Advice Acoustics Ltd that planning permission should be granted with conditions set based on the proposed acoustic mitigations stated within this report.

NOISE LEVEL SUMMARY ASSESSMENT																
Date / Time	LAeq	Lmax	Lmin	LA10	LA50	LA90	Octave Band Centre Frequency (Hz)									
							31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 23:00																
DAYTIME LOWEST L _{Aeq} 1 HOUR	59.6	75.8	38.1	59.4	51.2	42.2	57.3	62.0	57.4	54.5	55.5	55.3	50.1	47.3	53.1	43.0
DAYTIME HIGHEST L _{Aeq} 1 HOUR	68.2	91.3	51.4	61.5	57.9	53.7	64.5	67.6	60.7	67.1	66.8	62.4	56.2	53.2	47.8	42.0
DAYTIME AVERAGE L _{Aeq} 16 HOUR	63.3	82.2	48.4	62.6	56.9	51.8	63.6	66.7	60.5	60.6	59.8	59.2	54.8	53.1	52.6	45.8
23:00 - 07:00																
NIGHT TIME LOWEST L _{Aeq} 5 MIN	38.4	51.9	26.4	41.3	31.4	28.0	42.9	45.2	42.6	36.3	36.7	34.7	26.7	18.4	17.7	19.5
NIGHT TIME HIGHEST L _{Aeq} 5 MIN	65.0	80.8	36.9	67.1	48.4	39.6	59.5	65.0	61.6	59.0	61.0	60.1	56.4	55.2	57.1	48.2
NIGHT TIME AVERAGE L _{Aeq} 8 HOUR	56.3	72.3	35.9	57.5	46.6	38.7	56.6	59.6	53.9	51.2	53.2	52.5	47.4	44.2	42.1	33.2

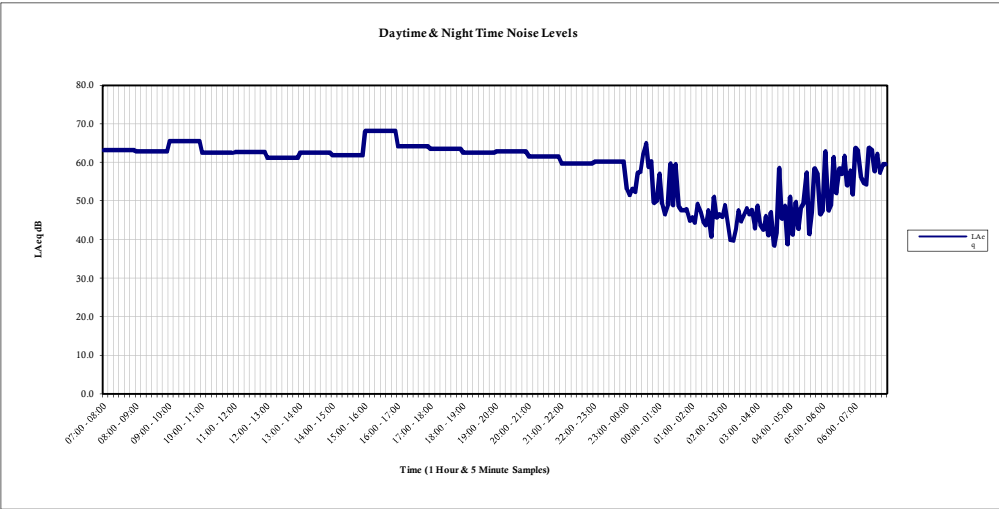


FIGURE 1
PAGE 1

DAYTIME NOISE LEVELS 07:00 - 23:00															
Date / Time	LAeq	Lmax	Lmin	LA10	LA50	LA90	Octave Band Centre Frequency (Hz)								
							31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	16.0 k
07:00 - 08:00	63.1	81.9	47.4	62.6	58.0	52.0	56.5	61.4	63.8	67.1	60.0	60.2	60.4	59.7	48.3
08:00 - 09:00	62.9	79.5	50.1	62.8	58.7	53.9	65.4	68.6	60.3	57.7	58.3	59.7	53.7	50.5	44.8
09:00 - 10:00	65.5	82.4	48.8	65.3	56.8	52.0	66.4	68.0	60.6	60.3	60.7	59.9	56.7	57.5	52.0
10:00 - 11:00	62.6	79.7	50.5	61.5	57.4	53.1	64.1	67.7	60.3	56.8	58.1	58.4	53.5	50.4	45.6
11:00 - 12:00	62.7	79.6	51.6	62.4	57.5	53.9	63.7	66.9	59.9	57.8	59.1	59.1	54.2	50.5	43.6
12:00 - 13:00	61.2	77.3	48.1	61.1	56.7	51.6	62.5	67.4	58.8	56.6	57.6	57.9	52.0	48.5	40.5
13:00 - 14:00	62.5	79.3	46.4	63.5	56.8	50.8	63.1	66.6	60.1	57.9	58.3	59.2	53.6	49.9	42.1
14:00 - 15:00	61.8	78.2	47.9	62.8	57.5	51.5	64.1	67.1	59.2	57.1	57.6	58.3	52.7	50.9	39.1
15:00 - 16:00	68.2	91.3	51.4	61.5	57.9	53.7	64.5	67.6	60.7	67.1	66.8	62.4	56.2	53.2	42.0
16:00 - 17:00	64.2	80.1	50.2	64.9	58.0	53.5	67.3	68.4	62.0	58.9	59.1	60.0	55.6	54.9	45.3
17:00 - 18:00	63.4	79.9	49.0	62.3	57.9	53.1	65.1	67.5	61.1	58.5	59.1	60.4	53.9	50.5	47.3
18:00 - 19:00	62.5	78.0	47.3	62.4	57.6	52.3	62.5	67.0	61.9	58.4	58.2	58.5	52.8	51.2	47.7
19:00 - 20:00	62.9	79.6	46.0	62.7	56.4	50.1	60.8	65.5	60.5	57.5	58.0	58.9	54.3	52.0	45.3
20:00 - 21:00	61.5	78.1	42.0	61.8	54.0	46.6	61.0	63.8	58.8	56.6	57.4	57.9	52.7	49.0	43.9
21:00 - 22:00	59.6	75.8	38.1	59.4	51.2	42.2	57.3	62.0	57.4	54.5	55.5	55.3	50.1	47.3	43.0
22:00 - 23:00	60.1	78.0	39.1	59.6	51.1	42.7	57.8	63.3	58.6	55.7	55.9	56.0	52.2	48.7	42.0

NIGHT TIME NOISE LEVELS 23:00 - 07:00															
Date / Time	LAeq	Lmax	Lmin	LA10	LA50	LA90	Octave Band Centre Frequency (Hz)								
							31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	16.0 k
23:00 - 00:00	53.1	65.3	38.4	57.1	48.8	40.2	53.0	58.6	53.9	51.6	50.5	50.2	41.4	29.1	22.0
	51.6	61.3	36.8	55.8	47.1	39.6	51.5	53.8	49.8	48.0	48.1	49.2	40.9	29.3	21.2
	53.2	62.2	37.4	58.1	47.7	40.2	55.5	59.3	50.3	49.4	49.7	50.9	42.9	30.6	22.0
	52.4	61.4	37.6	57.3	47.1	40.2	53.9	59.1	47.7	48.0	48.6	50.3	41.7	27.9	21.2
	57.4	74.4	38.5	57.6	48.0	40.1	56.6	61.7	54.2	53.0	54.2	53.5	49.0	45.2	31.1
	57.7	72.3	38.0	58.8	49.5	40.0	58.5	66.4	55.7	53.0	54.5	55.1	47.9	40.9	25.2
	62.1	74.5	36.6	65.6	52.6	38.7	56.4	62.0	59.0	56.5	57.7	57.1	54.9	53.6	33.5
	65.0	80.8	36.9	67.1	48.4	39.6	59.5	65.0	61.6	59.0	61.0	60.1	56.4	55.2	48.2
	58.8	77.2	37.8	58.9	47.1	39.6	54.9	59.8	59.6	55.2	54.8	53.7	51.1	49.3	40.3
	60.4	81.5	36.9	57.2	47.3	39.9	54.4	60.4	53.9	52.4	53.0	52.3	49.4	55.0	48.7
	49.5	60.1	36.3	53.9	42.1	38.3	49.6	53.5	45.4	46.0	45.5	47.6	38.2	24.3	22.0
	50.3	60.8	37.1	55.2	43.4	39.7	51.5	59.7	52.4	46.8	46.7	47.8	39.5	25.9	22.1
00:00 - 01:00	57.0	74.9	37.8	55.4	44.0	39.8	54.3	59.2	54.1	52.4	53.7	53.7	48.2	42.7	29.3
	49.2	59.5	34.8	54.6	42.0	36.7	52.2	54.0	43.7	44.9	45.4	47.1	38.3	25.4	22.2
	46.5	58.4	34.0	51.5	39.0	35.8	50.0	48.8	44.9	42.5	42.8	44.4	35.5	22.0	21.8
	49.1	64.0	35.2	52.6	41.6	37.1	51.3	53.3	50.2	48.0	45.9	46.2	38.0	27.6	22.2
	59.7	77.4	33.4	57.0	46.0	38.1	51.5	57.9	54.8	52.8	55.9	55.6	51.7	49.8	35.3
	48.9	60.2	33.3	52.9	40.5	34.7	54.4	55.5	45.3	45.3	44.8	46.8	38.0	24.6	21.1
	59.6	77.3	32.6	55.3	39.8	34.9	57.9	62.8	58.5	54.5	56.5	55.4	52.2	47.8	29.9
	48.6	75.0	33.4	52.6	39.4	35.3	49.8	52.5	44.4	44.4	45.5	46.0	37.8	31.1	26.5
	47.6	64.3	31.5	47.5	37.3	32.8	47.9	56.5	48.7	42.5	43.1	45.8	36.0	23.1	20.0
	47.5	58.6	32.1	51.5	40.9	35.6	50.2	52.2	48.4	44.3	43.6	45.4	36.6	22.7	20.2
	47.9	59.7	32.2	51.3	39.2	34.9	48.6	53.5	54.2	44.8	43.8	45.5	36.5	23.9	20.2
	45.0	58.2	30.6	48.5	36.3	32.5	44.6	50.5	39.9	41.1	41.5	42.7	33.8	23.6	20.7
01:00 - 02:00	45.7	59.2	29.8	48.3	35.3	31.5	48.8	54.9	43.7	42.2	42.4	43.3	34.3	21.6	20.3
	44.5	58.6	31.3	46.6	36.6	33.1	48.8	52.5	44.1	41.0	42.4	41.7	33.0	22.9	20.5
	49.2	60.7	30.2	53.9	36.4	31.9	48.6	51.7	46.8	45.6	44.9	47.2	38.1	24.5	20.8
	47.2	59.9	30.3	51.1	34.8	31.5	47.0	54.2	41.2	42.5	43.0	45.3	36.0	22.2	19.9

NIGHT TIME NOISE LEVELS 23:00 - 07:00														
Date / Time	LAeq	Lmax	Lmin	LA10	LA50	LA90	Octave Band Centre Frequency (Hz)							
							31.5	63	125	250	500	1.0 k	2.0 k	4.0 k
01:00 - 02:00 <i>Continued</i>	44.8	60.5	27.7	46.0	32.6	29.5	47.8	48.0	43.6	40.4	41.9	42.5	32.9	20.5
	43.8	59.9	27.0	43.3	29.9	27.9	44.5	44.8	38.5	39.2	39.4	42.1	32.2	18.4
	47.6	62.8	27.7	51.2	32.6	28.9	55.5	61.4	50.8	44.1	44.3	44.5	36.7	24.4
	40.7	59.0	27.8	37.2	30.6	28.8	44.3	42.1	37.4	35.4	37.5	38.7	28.9	16.8
	51.1	65.6	29.0	54.7	35.1	29.7	57.6	60.5	54.7	50.5	48.3	47.8	39.1	26.1
	45.7	59.8	27.3	48.4	31.8	28.2	47.0	48.5	41.8	41.1	42.0	43.6	34.7	21.2
	46.6	59.6	26.7	50.1	31.8	28.2	46.8	51.9	42.6	42.4	43.0	44.3	36.0	22.4
02:00 - 03:00	45.9	60.1	27.9	48.3	32.2	29.2	48.0	48.0	41.7	42.2	42.2	43.8	34.4	23.0
	48.9	63.5	26.5	53.0	32.7	28.3	49.4	51.3	43.7	43.3	45.5	47.0	37.5	25.4
	44.6	58.6	28.1	47.7	32.2	29.0	45.5	50.1	42.8	40.7	40.6	42.6	33.0	20.4
	39.9	56.5	26.7	41.0	29.8	28.0	42.3	44.6	37.3	36.7	36.3	37.7	28.3	16.4
	39.8	56.6	27.6	41.3	29.8	28.0	45.6	50.0	38.3	35.4	36.0	37.5	29.0	18.1
	42.7	58.5	27.3	39.6	30.0	28.0	44.8	43.6	38.0	36.4	39.0	40.8	31.0	19.1
	47.6	61.9	26.3	49.5	34.9	27.1	49.6	50.3	44.2	44.1	45.0	45.1	36.1	25.8
	44.8	60.7	26.3	41.5	30.1	27.2	43.6	56.9	45.7	41.0	40.5	42.5	33.6	19.5
	46.5	60.1	27.9	49.1	32.6	28.6	48.4	50.1	42.7	42.3	43.8	44.1	34.9	23.6
	48.1	60.6	26.3	51.9	31.3	27.5	46.5	50.7	48.2	43.2	44.0	46.0	37.3	24.0
	46.6	60.2	28.5	49.9	34.5	29.9	48.1	50.0	46.9	43.4	42.8	44.3	36.1	24.3
	47.8	62.9	28.0	51.0	32.3	28.8	48.1	50.1	47.0	44.0	44.1	45.8	36.8	23.4
03:00 - 04:00	43.0	59.7	25.3	39.2	28.9	26.2	42.7	39.6	35.9	37.6	38.8	41.0	32.5	18.8
	48.7	63.9	26.8	51.7	31.4	27.7	49.2	52.8	47.7	44.1	45.5	46.4	38.1	25.8
	44.0	63.4	26.4	38.4	28.3	27.0	45.0	43.9	43.0	40.4	41.4	41.5	32.5	21.6
	42.6	60.3	26.4	40.1	29.4	27.3	45.3	42.1	38.3	39.4	39.2	40.5	31.1	17.9
	46.1	60.9	27.1	49.0	32.2	28.2	43.8	45.8	38.5	41.0	42.4	44.2	35.0	21.7
	41.1	60.0	26.1	33.3	29.8	26.8	42.2	48.4	37.7	37.0	38.2	38.8	29.0	19.9
	47.0	64.0	27.2	45.7	31.7	28.4	51.5	56.7	47.5	46.7	44.6	43.4	35.3	26.3
	38.4	51.9	26.4	41.3	31.4	28.0	42.9	45.2	42.6	36.3	36.7	34.7	26.7	18.4
	41.9	57.6	27.7	40.1	32.3	29.5	46.8	52.1	39.6	37.1	38.3	39.6	31.1	20.1
	58.5	76.4	26.9	54.9	33.9	28.6	61.4	66.0	61.5	56.5	56.1	54.7	49.4	41.6
	45.4	61.4	26.1	46.4	31.6	27.7	46.6	49.5	40.2	40.3	42.5	43.0	34.7	24.0
	48.8	64.3	25.6	51.8	33.5	27.9	56.6	59.4	47.6	45.8	45.6	46.4	37.5	26.5
04:00 - 05:00	38.8	56.8	25.4	34.4	28.9	26.7	41.2	38.2	33.1	35.0	36.0	36.0	28.7	16.6
	51.0	64.3	26.7	54.9	36.4	29.6	55.2	57.3	48.8	48.2	48.0	48.6	39.2	27.8
	41.3	57.6	25.3	42.4	28.6	26.4	45.1	48.5	39.7	38.0	38.4	38.3	31.9	21.6
	49.8	63.3	25.8	52.6	33.3	26.8	52.4	57.1	45.3	44.7	46.7	47.7	38.5	26.5
	42.8	60.0	25.8	46.8	30.8	26.8	48.3	49.4	39.1	40.3	39.2	40.2	31.8	21.4
	48.4	66.7	25.3	49.2	29.2	26.3	52.8	55.6	46.0	44.0	45.4	46.1	37.1	26.9
	49.5	66.4	27.6	50.2	34.5	29.5	48.5	51.0	43.2	43.7	45.3	47.7	38.3	25.4
	57.4	76.5	27.5	57.1	36.5	28.6	60.5	59.9	49.8	52.7	55.0	53.9	48.7	43.7
	41.4	57.8	27.0	42.7	30.9	28.4	48.3	49.5	40.4	40.9	39.2	37.8	30.1	21.3
	47.0	60.7	28.1	50.9	33.2	29.3	46.6	51.4	42.6	42.8	43.3	44.8	36.4	24.2
	58.5	76.8	27.3	52.4	36.6	28.7	55.2	61.7	58.0	53.1	55.7	53.0	51.6	48.5
	56.8	74.6	27.7	57.9	44.0	31.6	56.7	60.0	53.7	51.3	53.5	53.9	48.3	42.2
05:00 - 06:00	46.6	58.0	26.4	50.7	36.0	27.6	49.5	53.6	45.7	44.1	43.0	43.8	35.9	30.0
	47.8	63.3	27.4	50.8	31.8	28.3	45.7	52.0	57.0	45.8	43.3	44.4	34.9	28.5
	62.9	78.0	29.4	57.6	42.4	31.5	57.5	61.6	59.1	57.0	60.3	59.5	54.2	48.5
	47.6	59.5	30.4	51.3	40.6	31.5	48.7	52.6	43.6	43.7	43.1	44.2	36.0	35.2
	49.0	61.5	34.2	52.4	42.0	33.6	54.1	56.6	44.0	44.0	44.8	46.3	36.3	35.7
	61.4	77.3	31.7	56.9	44.4	33.7	55.1	59.6	57.4	56.4	58.6	57.5	53.3	48.8
	52.0	63.3	33.8	56.5	46.1	36.7	58.3	58.8	50.9	50.8	49.4	48.8	41.2	32.7

NIGHT TIME NOISE LEVELS 23:00 - 07:00															
Date / Time	LAeq	Lmax	Lmin	LA10	LA50	LA90	Octave Band Centre Frequency (Hz)								
							31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	16.0 k
05:00 - 06:00 <i>Continued</i>	58.5	76.7	33.4	57.6	45.8	34.8	54.4	59.7	55.3	54.2	56.0	53.5	50.6	48.1	31.9
	57.1	74.8	37.8	58.5	49.2	41.9	56.8	61.4	52.5	52.2	53.2	54.1	48.0	43.8	34.2
	61.7	81.7	40.9	60.1	53.1	45.7	67.3	65.9	60.8	56.1	59.6	58.4	48.5	42.1	27.1
	54.1	62.6	38.5	58.9	49.8	41.7	56.4	59.8	51.1	50.2	50.7	51.7	43.1	34.4	26.7
	57.8	74.5	37.3	59.1	49.7	40.3	65.1	65.2	56.1	54.1	54.3	55.0	49.0	42.4	29.4
06:00 - 07:00	51.7	62.2	38.2	56.2	45.7	39.4	54.3	54.5	51.8	49.7	48.3	48.9	40.4	31.4	26.3
	63.9	77.3	39.5	66.0	56.3	43.5	59.2	63.5	58.9	58.2	61.1	59.7	55.9	53.3	35.4
	63.0	75.6	37.7	63.4	48.9	39.4	59.8	65.4	60.6	57.2	60.0	59.0	54.7	51.0	33.3
	56.1	65.1	44.8	60.1	53.0	45.9	58.3	62.7	55.4	50.7	51.0	52.4	44.7	43.8	29.9
	54.7	64.2	39.9	58.8	51.8	42.1	58.2	61.1	50.0	50.7	51.5	52.0	43.0	36.5	25.2
	54.3	62.7	38.5	58.5	50.5	41.7	56.8	61.9	54.5	51.1	50.9	51.7	43.1	32.0	22.8
	63.8	79.1	38.8	60.1	49.7	40.9	58.9	64.6	60.0	57.8	61.6	60.3	54.8	48.8	33.0
	63.2	79.1	41.9	62.6	54.0	46.4	68.3	66.7	57.5	56.7	60.7	60.0	54.1	48.4	33.1
	57.7	70.3	40.7	60.5	53.4	44.3	61.7	63.8	56.3	53.7	55.0	54.5	48.5	40.1	24.3
	62.2	75.8	38.4	63.7	53.4	45.6	58.2	64.1	60.0	57.1	58.9	58.4	54.1	49.9	29.8
	57.3	66.6	44.7	61.3	54.4	47.9	59.2	63.6	55.7	53.6	54.3	54.7	46.7	36.1	21.9
	59.5	75.5	45.8	60.9	54.6	48.2	59.8	65.1	59.1	54.6	56.6	57.0	48.6	41.1	23.7

Calculation Sheet BS 8233:1999 (Table 3)

Client	Ravenswood Holdings
Site	New Road, Havant
Figure	2

Maximum Criteria	
Daytime	Night Time
35	30

Floor	Ground Floor
Room	Living/Kitchen

Daytime	MET
Evening	MET

Proposed Window Configuration	4 / 14 / 6 with Standard Trickle Vent
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Leqff	The equivalent continuous sound pressure level outside the room elements under consideration
A0	The reference absorption area of 10m ² and is independent of frequency
Sf	The total façade area of the room in question
Swi	The area of the windows in the room
Sew	The area of the external wall of the room
Srr	The area of the ceiling of the room (if applicable)
S	The total area of the elements through which sound enters the room
Dne	The insulation value of the trickle ventilator (if applicable)
Rwi	The sound reduction index of the window
Rew	The sound reduction index of the external wall
Rrr	The sound reduction index of the ceiling/roof (if applicable)
A	The equivalent absorption area of the receiving room where $A=0.163V/T$

Formula	$Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$
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	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Sf	25	25	25	25	25	25
Sr	0	0	0	0	0	0
Swi	4.4	4.4	4.4	4.4	4.4	4.4
Sew	20.6	20.6	20.6	20.6	20.6	20.6
Srr	0	0	0	0	0	0
S	25	25	25	25	25	25
A0	10	10	10	10	10	10
V	63	63	63	63	63	63
T (BS8233)	0.50	0.50	0.50	0.50	0.50	0.50
A	20	20	20	20	20	20
Daytime Leqff	60.5	60.6	59.8	59.2	54.8	53.1
Night time Leqff	53.9	51.2	53.2	52.5	47.4	44.2
Dne	33	32	29	29	31	30
Rwi	24.4	26.5	36.2	41.7	40.3	42.6
Rew	40.0	44.0	45.0	51.0	56.0	58.0
Rrr	28.0	34.0	40.0	45.0	49.0	53.0

*estimated

Predicted dB(A) Level Within The Above Room During Daytime Hours (07:00-23:00)	L_{Aeq} 16 HOUR	34.3	dB(A)
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Predicted dB(A) Level Within The Above Room During Night Time Hours (23:00-07:00)	L_{Aeq} 8 HOUR	27.2	dB(A)
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Calculation Sheet BS 8233:1999 (Table 3)

Client	Ravenswood Holdings
Site	New Road, Havant
Figure	3

Maximum Criteria	
Daytime	Night Time
35	30

Floor	Ground Floor
Room	Bedroom 1

Daytime	MET
Evening	MET

Proposed Window Configuration	4 / 14 / 6 with Standard Trickle Vent
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Leqff	The equivalent continuous sound pressure level outside the room elements under consideration
A0	The reference absorption area of 10m ² and is independent of frequency
Sf	The total façade area of the room in question
Swi	The area of the windows in the room
Sew	The area of the external wall of the room
Srr	The area of the ceiling of the room (if applicable)
S	The total area of the elements through which sound enters the room
Dne	The insulation value of the trickle ventilator (if applicable)
Rwi	The sound reduction index of the window
Rew	The sound reduction index of the external wall
Rrr	The sound reduction index of the ceiling/roof (if applicable)
A	The equivalent absorption area of the receiving room where $A=0.163V/T$

Formula	$Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$
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	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Sf	30	30	30	30	30	30
Sr	0	0	0	0	0	0
Swi	4.4	4.4	4.4	4.4	4.4	4.4
Sew	25.6	25.6	25.6	25.6	25.6	25.6
Srr	0	0	0	0	0	0
S	30	30	30	30	30	30
A0	10	10	10	10	10	10
V	76	76	76	76	76	76
T (BS8233)	0.50	0.50	0.50	0.50	0.50	0.50
A	24	24	24	24	24	24
Daytime Leqff	60.5	60.6	59.8	59.2	54.8	53.1
Night time Leqff	53.9	51.2	53.2	52.5	47.4	44.2
Dne	33	32	29	29	31	30
Rwi	24.4	26.5	36.2	41.7	40.3	42.6
Rew	40.0	44.0	45.0	51.0	56.0	58.0
Rrr	28.0	34.0	40.0	45.0	49.0	53.0

*estimated

Predicted dB(A) Level Within The Above Room During Daytime Hours (07:00-23:00)	L_{Aeq} 16 HOUR	33.7	dB(A)
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Predicted dB(A) Level Within The Above Room During Night Time Hours (23:00-07:00)	L_{Aeq} 8 HOUR	26.5	dB(A)
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Calculation Sheet BS 8233:1999 (Table 3)

Client	Ravenswood Holdings
Site	New Road, Havant
Figure	4

Maximum Criteria	
Daytime	Night Time
35	30

Floor	Ground Floor
Room	Bedroom 2

Daytime	MET
Evening	MET

Proposed Window Configuration	4 / 14 /6 with Acoustic through frame slot vent
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Leqff	The equivalent continuous sound pressure level outside the room elements under consideration
A0	The reference absorption area of 10m ² and is independent of frequency
Sf	The total façade area of the room in question
Swi	The area of the windows in the room
Sew	The area of the external wall of the room
Srr	The area of the ceiling of the room (if applicable)
S	The total area of the elements through which sound enters the room
Dne	The insulation value of the trickle ventilator (if applicable)
Rwi	The sound reduction index of the window
Rew	The sound reduction index of the external wall
Rrr	The sound reduction index of the ceiling/roof (if applicable)
A	The equivalent absorption area of the receiving room where $A=0.163V/T$

Formula	$Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$
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	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Sf	7	7	7	7	7	7
Sr	0	0	0	0	0	0
Swi	3.2	3.2	3.2	3.2	3.2	3.2
Sew	3.8	3.8	3.8	3.8	3.8	3.8
Srr	0	0	0	0	0	0
S	7	7	7	7	7	7
A0	10	10	10	10	10	10
V	40	40	40	40	40	40
T (BS8233)	0.50	0.50	0.50	0.50	0.50	0.50
A	13	13	13	13	13	13
Daytime Leqff	60.5	60.6	59.8	59.2	54.8	53.1
Night time Leqff	53.9	51.2	53.2	52.5	47.4	44.2
Dne	40	38	37	34	37	38
Rwi	24.4	26.5	36.2	41.7	40.3	42.6
Rew	40.0	44.0	45.0	51.0	56.0	58.0
Rrr	28.0	34.0	40.0	45.0	49.0	53.0

*estimated

Predicted dB(A) Level Within The Above Room During Daytime Hours (07:00-23:00)	L_{Aeq} 16 HOUR	30.8	dB(A)
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Predicted dB(A) Level Within The Above Room During Night Time Hours (23:00-07:00)	L_{Aeq} 8 HOUR	23.7	dB(A)
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Calculation Sheet BS 8233:1999 (Table 3)

Client	Ravenswood Holdings
Site	New Road, Havant
Figure	5

Maximum Criteria	
Daytime	Night Time
35	30

Floor	First Floor
Room	Living Room

Daytime	MET
Evening	MET

Proposed Window Configuration	4 / 14 / 6 with Standard Trickle Vent
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Leqff	The equivalent continuous sound pressure level outside the room elements under consideration
A0	The reference absorption area of 10m ² and is independent of frequency
Sf	The total façade area of the room in question
Swi	The area of the windows in the room
Sew	The area of the external wall of the room
Srr	The area of the ceiling of the room (if applicable)
S	The total area of the elements through which sound enters the room
Dne	The insulation value of the trickle ventilator (if applicable)
Rwi	The sound reduction index of the window
Rew	The sound reduction index of the external wall
Rrr	The sound reduction index of the ceiling/roof (if applicable)
A	The equivalent absorption area of the receiving room where $A=0.163V/T$

Formula	$Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$
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	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Sf	30	30	30	30	30	30
Sr	30	30	30	30	30	30
Swi	5	5	5	5	5	5
Sew	25	25	25	25	25	25
Srr	30	30	30	30	30	30
S	60	60	60	60	60	60
A0	10	10	10	10	10	10
V	70	70	70	70	70	70
T (BS8233)	0.50	0.50	0.50	0.50	0.50	0.50
A	22	22	22	22	22	22
Daytime Leqff	60.5	60.6	59.8	59.2	54.8	53.1
Night time Leqff	53.9	51.2	53.2	52.5	47.4	44.2
Dne	33	32	29	29	31	30
Rwi	24.4	26.5	36.2	41.7	40.3	42.6
Rew	40.0	44.0	45.0	51.0	56.0	58.0
Rrr	28.0	34.0	40.0	45.0	49.0	53.0

*estimated

Predicted dB(A) Level Within The Above Room During Daytime Hours (07:00-23:00)	L_{Aeq} 16 HOUR	34.8	dB(A)
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Predicted dB(A) Level Within The Above Room During Night Time Hours (23:00-07:00)	L_{Aeq} 8 HOUR	27.6	dB(A)
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Calculation Sheet BS 8233:1999 (Table 3)

Client	Ravenswood Holdings
Site	New Road, Havant
Figure	6

Maximum Criteria	
Daytime	Night Time
35	30

Floor	First Floor
Room	Bedroom 1

Daytime	MET
Evening	MET

Proposed Window Configuration	4 / 14 / 6 with Standard Trickle Vent
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Leqff	The equivalent continuous sound pressure level outside the room elements under consideration
A0	The reference absorption area of 10m ² and is independent of frequency
Sf	The total façade area of the room in question
Swi	The area of the windows in the room
Sew	The area of the external wall of the room
Srr	The area of the ceiling of the room (if applicable)
S	The total area of the elements through which sound enters the room
Dne	The insulation value of the trickle ventilator (if applicable)
Rwi	The sound reduction index of the window
Rew	The sound reduction index of the external wall
Rrr	The sound reduction index of the ceiling/roof (if applicable)
A	The equivalent absorption area of the receiving room where $A=0.163V/T$

Formula	$Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$
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	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Sf	30	30	30	30	30	30
Sr	29	29	29	29	29	29
Swi	2.52	2.52	2.52	2.52	2.52	2.52
Sew	27.48	27.48	27.48	27.48	27.48	27.48
Srr	29	29	29	29	29	29
S	59	59	59	59	59	59
A0	10	10	10	10	10	10
V	69	69	69	69	69	69
T (BS8233)	0.50	0.50	0.50	0.50	0.50	0.50
A	22	22	22	22	22	22
Daytime Leqff	60.5	60.6	59.8	59.2	54.8	53.1
Night time Leqff	53.9	51.2	53.2	52.5	47.4	44.2
Dne	33	32	29	29	31	30
Rwi	24.4	26.5	36.2	41.7	40.3	42.6
Rew	40.0	44.0	45.0	51.0	56.0	58.0
Rrr	28.0	34.0	40.0	45.0	49.0	53.0

*estimated

Predicted dB(A) Level Within The Above Room During Daytime Hours (07:00-23:00)	L_{Aeq} 16 HOUR	34.6	dB(A)
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Predicted dB(A) Level Within The Above Room During Night Time Hours (23:00-07:00)	L_{Aeq} 8 HOUR	27.5	dB(A)
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Calculation Sheet BS 8233:1999 (Table 3)

Client	Ravenswood Holdings
Site	New Road, Havant
Figure	7

Maximum Criteria	
Daytime	Night Time
35	30

Floor	First Floor
Room	Bedroom 2

Daytime	MET
Evening	MET

Proposed Window Configuration	4 / 14 / 6 with Acoustic through frame slotvent
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Leqff	The equivalent continuous sound pressure level outside the room elements under consideration
A0	The reference absorption area of 10m ² and is independent of frequency
Sf	The total façade area of the room in question
Swi	The area of the windows in the room
Sew	The area of the external wall of the room
Srr	The area of the ceiling of the room (if applicable)
S	The total area of the elements through which sound enters the room
Dne	The insulation value of the trickle ventilator (if applicable)
Rwi	The sound reduction index of the window
Rew	The sound reduction index of the external wall
Rrr	The sound reduction index of the ceiling/roof (if applicable)
A	The equivalent absorption area of the receiving room where $A=0.163V/T$

Formula	$Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$
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	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Sf	7	7	7	7	7	7
Sr	16	16	16	16	16	16
Swi	2.52	2.52	2.52	2.52	2.52	2.52
Sew	4.48	4.48	4.48	4.48	4.48	4.48
Srr	16	16	16	16	16	16
S	23	23	23	23	23	23
A0	10	10	10	10	10	10
V	39	39	39	39	39	39
T (BS8233)	0.50	0.50	0.50	0.50	0.50	0.50
A	12	12	12	12	12	12
Daytime Leqff	60.5	60.6	59.8	59.2	54.8	53.1
Night time Leqff	53.9	51.2	53.2	52.5	47.4	44.2
Dne	40	38	37	34	37	38
Rwi	24.4	26.5	36.2	41.7	40.3	42.6
Rew	40.0	44.0	45.0	51.0	56.0	58.0
Rrr	28.0	34.0	40.0	45.0	49.0	53.0

*estimated

Predicted dB(A) Level Within The Above Room During Daytime Hours (07:00-23:00)	L_{Aeq} 16 HOUR	32.2	dB(A)
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Predicted dB(A) Level Within The Above Room During Night Time Hours (23:00-07:00)	L_{Aeq} 8 HOUR	25.0	dB(A)
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