

ARR/PPN/C/2489.05 Rev A

19th February 2017

Store Property Investments
Limited

Assessment of noise at Land West of
Brook Lane and South of A259
(within the Parishes of Brookfield and
Angmering and Findon) for proposed
residential development

Prepared for :-

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CONTENTS

1.0 SUMMARY

2.0 INTRODUCTION

3.0 ASSESSMENT STANDARDS

3.1 NPPF

3.2 BS8233

3.3 Local Authority

4.0 SURVEY DETAILS

4.1 Site Times and Personnel

4.2 Instrumentation

4.3 Measurement Positions

4.4 Survey Conditions

5.0 RESULTS AND DISCUSSIONS

5.1 Basic Results

5.2 Assessment

5.3 Mitigation

6.0 CONCLUSIONS/RECOMMENDATIONS

Appendix 1: Definition of Acoustic Terms

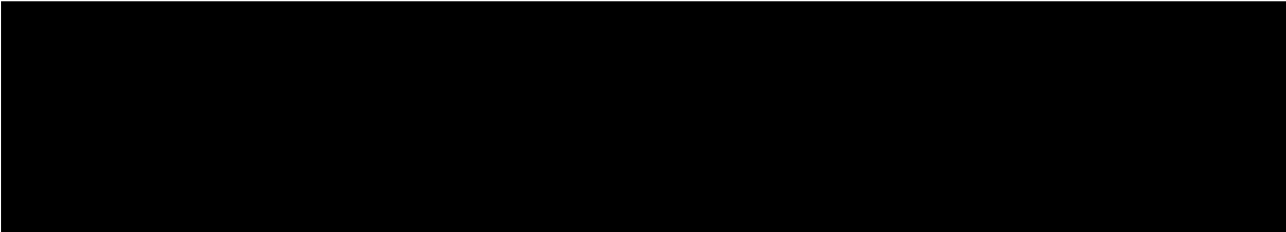
Appendix 2: Measurement and Calculation Details

1.0 **SUMMARY**

The noise climate was dominated by traffic on the A259. Trains ran approximately every 20 minutes during rush hour and every 30 minutes or so up to about 00:30 at night. We discussed the railway line with local residents and all confirmed that they were unaware of any freight trains during the night.

The A259 boundary and the railway boundary are shown on plans with 2m high acoustic fences proposed along their entire lengths. These should be sufficient to reduce noise in worst affected gardens to reasonable levels and similarly reduce noise break-in to worst affected ground floor rooms. All living rooms at ground floor level should be acceptable with basic thermal double glazing and non-acoustic vents.

Bedrooms at first floor level will not benefit from the fencing and the facades overlooking the A259 and the railway will require closed windows and upgraded glazing and acoustic vents to achieve BS8233 criteria. Bedroom facades which do not overlook the A259 or the railway should be acceptable with basic thermal double glazing.



A R Raymond

P J Durell

2.0 INTRODUCTION

ADC was asked to carry out an independent assessment of the above site with regards to its suitability for residential development from a noise perspective.

This report begins by summarising assessment standards and, where appropriate, discusses alternative interpretations.

After a brief statement of survey details we discuss basic results and the resulting assessment, along with any mitigation which might be implied. We sum-up and conclude at the end, along with brief recommendations.

3.0 ASSESSMENT STANDARDS

3.1 NPPF

The National Planning Policy Framework provides nothing in the way of quantitative criteria. The main statement on noise is to be found in paragraph 123:-

123. Planning policies and decisions should aim to:

- ✱ avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- ✱ mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- ✱ recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- ✱ identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The NPPF refers to the Noise Policy Statement for England (NPSE) which sets out the following aims:-

1. avoid significant adverse impacts on health and quality of life;
2. mitigate and minimise adverse impacts on health and quality of life; and
3. where possible, contribute to the improvement of health and quality of life.

It also introduces the concepts of:

- ✱ NOEL – No Observed Effect Level. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- ✱ LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.

- ✱ SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.

SOAEL is clearly something the policy seeks to avoid in aim 1. Aim 2 represents situations between SOAEL and LOAEL, and seeks to minimise and mitigate the effects.

3.2 BS8233

BS8233 was updated in March 2014. Quantitatively, however, the design criteria are little changed – just expressed differently to reduce ambiguity in certain situations.

Table 4 of BS8233 gives the desirable criteria for indoor ambient noise levels for dwellings as follows:-

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,16hour}$

Note that the standard accepts the widely used rule of thumb that, for a partly open window, the levels just outside will be 15dB higher than those just inside. This brings us to an external equivalent of the above table, as follows:-

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	50 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	55 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	50 dB $L_{Aeq,16hour}$	45 dB $L_{Aeq,16hour}$

It goes on to state that, where necessary, the criteria can be relaxed by up to 5 dB and still achieve reasonable conditions. Note that the new version no longer states criteria for bedroom noise in terms of dB L_{Amax} .

Garden area criteria are unchanged with 50 dB L_{Aeq} and 55 dB L_{Aeq} being considered desirable and reasonable respectively.

Note that the new version of BS8233 more explicitly specifies the assessment periods as 16 hour and 8 hour for daytime and night time respectively.

3.3 Local Authority

As far as we are aware no planning conditions have been proposed.

4.0 SURVEY DETAILS

4.1 Site Times and Personnel

The measurements were carried out by Mark Pickering of ADC Acoustics.

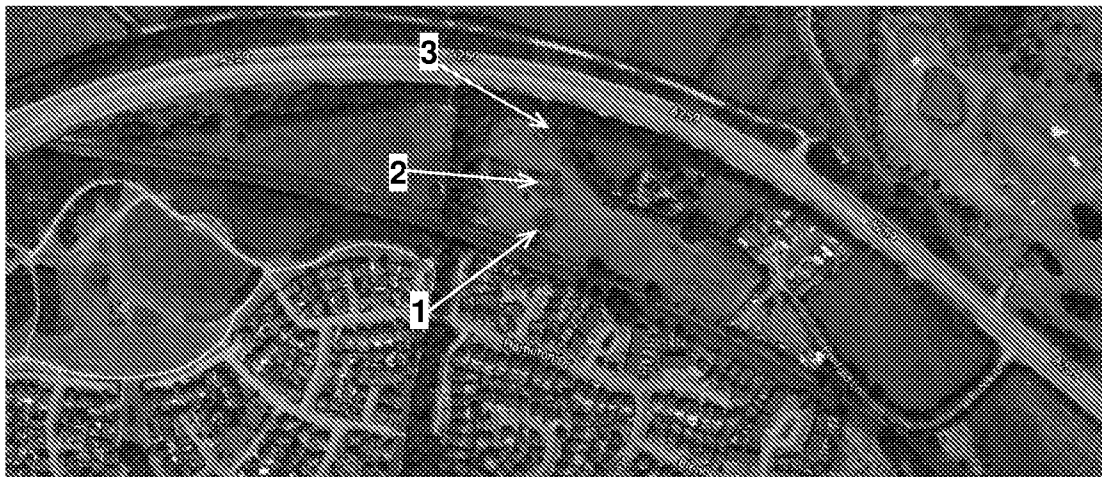
Daytime measurements were carried out on 15th February 2017 between approximately 16:00 hours and 18:00 hours to represent rush hour and between approximately 2300 hours and 0100 hours, representing what was likely to be a noisier time of night.

4.2 Instrumentation

Instrumentation used was a Rion N52. This is a precision grade sound level meter which holds a current calibration certificate and which was field-calibrated as necessary. The meter was set up to measure 15 minute samples in terms of dB L_{eq} , dB L_{max} and dB L_{90} in overall A-weighted terms, and in octave bands across the frequency range. See Definition of Acoustic Terms in Appendix 1.

4.3 Measurement Positions

The main measurement positions were as shown on the following plan.



Positions 1 and 3 represent the positions of the closest facades to the railway and to the A259 respectively. Position 2 was chosen as a central position. The microphone was 1.5 m above ground and well away from other reflecting surfaces.

4.4 Survey Conditions

We have no reason to believe that the conditions we found on the survey were anything other than representative of normal conditions. This was confirmed by conversations with local residents.

Weather conditions were as follows :-

Rain	:	none, dry roads
Cloud	:	50 to 80%
Temperature	:	5 to 12 Celsius
Wind	:	negligible

5.0 RESULTS AND DISCUSSIONS

The noise climate was dominated by traffic on the A259. Trains ran approximately every 20 minutes during rush hour and every 30 minutes

up to about 00:30 at night. We discussed the railway line with local residents and all confirmed that they were unaware of any freight trains during the night.

5.1 Basic Results

Full details are given in Appendix 2. A summary is as follows:-

Time	Position	Index	dB(A)
Overall Rush Hour	1	Leq	65
		Lmax	76
		L90	60
	2	Leq	65
		Lmax	77
		L90	60
	3	Leq	66
		Lmax	74
		L90	61
Overall Early Night	1	Leq	58
		Lmax	75
		L90	47
	2	Leq	59
		Lmax	72
		L90	47
	3	Leq	58
		Lmax	74
		L90	46

5.2 Assessments

The above results give the following assessments.

In terms of BS8233, we are mainly concerned with the dB(A) L_{eq} values, or the dB L_{Aeq} levels. See definition of Acoustic terms in Appendix 1. The new version of BS8233 no longer has night time criteria in terms of dB(A) L_{max} values, or dB L_{Amax} values, but some local authorities still like to see them presented.

The measured levels appear to suggest that sound insulation will need to be designed to control external noise break-in as follows:

Required Reductions for BS8233 Guidelines

Environment	Position	Required Reductions	
		Desirable	Reasonable
Living Rooms	1	30 dB	25 dB
	2	30 dB	25 dB
	3	31 dB	26 dB
Bedrooms	1	28 dB	23 dB
	2	29 dB	24 dB
	3	28 dB	23 dB
Outdoor Living Areas	1	15 dB	10 dB
	2	15 dB	10 dB
	3	16 dB	11 dB

Note, of course, that these assertions are based upon the assumption that night-time noise levels are represented by measurements around midnight and that daytime noise levels are represented by measurements around afternoon at rush hour. In other words, they should represent a worst-case.

5.3 Mitigation

The A259 boundary and the railway boundary are shown with 2m high acoustic fences proposed along their entire lengths. Barrier calculations are shown in Appendix 2 but, in summary, the worst affected gardens closest to the road and railway should see levels reduced to 55 dB L_{Aeq} for rush hour periods. Even if these levels were to persist from 07:00 to 23:00, they would still meet the BS8233 criterion for “reasonable” conditions. The fences should be solid with no gaps and have a density of approximately 20 kg/m². These fences also reduce the break-in to ground floor living rooms.

A partly open window can be expected to provide about 15 dB reduction. Along with the fences described above, this will be sufficient to achieve BS8233 “Reasonable” conditions within ground floor living rooms.

Bedrooms at first floor will not benefit from the fencing and will need to rely on closed windows to achieve BS8233 criteria. This implies that ventilation will be required such that occupants have the realistic option of keeping windows shut. This can be achieved using active or passive ventilation through acoustic vents or a whole house-type system which does not require any wall or window vents. Note that bedrooms will also require upgraded glazing to the facades overlooking the road or railway. Other facades will be fine with basic thermal double glazing.

A summary of mitigation (or building elements assumed in our calculations) is as follows:-

Façade	Room Type	Make-Up on Which Calculations are Based
Position 1	Living Room	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: Non-acoustic eg. Simon Airstrip 300
	Bedroom	Walls: Traditional Masonry Glazing: 35 Rw, eg, 10+14+4 Vents: 42 Dn,e,w eg, Passivent TVALdB 800
Position 2	Living Room	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: Non-acoustic eg. Simon Airstrip 300
	Bedroom	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: 42 Dn,e,w eg, Passivent TVALdB 800
Position 3	Living Room	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: Non-acoustic eg. Simon Airstrip 300
	Bedroom	Walls: Traditional Masonry Glazing: 35 Rw, eg, 10+14+4 Vents: 42 Dn,e,w eg, Passivent TVALdB 800

Full calculation details are shown in Appendix 2 and a summary is as follows:-

Internal	Time	Index	dB(A)
Position 1 Living Room or Bedroom	Rush	Leq	35
	Night	Leq	27
		Lmax	48
Position 2 Living Room or Bedroom	Rush	Leq	34
	Night	Leq	29
		Lmax	44
Position 3 Living Room or Bedroom	Rush	Leq	35
	Night	Leq	27
		Lmax	45

External	Time	Index	dB(A)
Position 1	Rush	Leq	55
Position 3	Rush	Leq	55

Of course, these assessments are very robust as they use what are likely to be the noisier times of day and night, assume all facades have unrestricted lines of site to the main sources and that the development itself will not provide any screening to its own properties.

6.0 CONCLUSIONS/RECOMMENDATIONS

The noise climate was dominated by traffic on the A259. Trains ran approximately every 20 minutes during rush hour and every 30 minutes or so up to about 00:30 at night. We discussed the railway line with local residents and all confirmed that they were unaware of any freight trains during the night.

The A259 boundary and the railway boundary are shown on plans with 2m high acoustic fences proposed along their entire lengths. These should be sufficient to reduce noise in worst affected gardens to reasonable levels and similarly reduce noise break-in to worst affected ground floor rooms. All living rooms at ground floor level should be acceptable with basic thermal double glazing and non-acoustic vents.

Bedrooms at first floor level will not benefit from the fencing and the facades overlooking the A259 and the railway will require closed windows and upgraded glazing and acoustic vents to achieve BS8233 criteria. Bedroom facades which do not overlook the A259 or the railway should be acceptable with basic thermal double glazing.

Appendix 1

Definition of Acoustic Terms

The Decibel

The decibel is the basic unit of noise measurement and is denoted dB. Technically, it is a means of expressing the difference in noise level between the measured noise and a standard level of noise. Most often the threshold of human hearing is used as the standard reference but it really should be stated. The threshold of human hearing is a sound pressure of $20\mu\text{Pa}$ or a sound power of 1pW .

A sound pressure level or SPL should be expressed in dB(re. $20\mu\text{Pa}$). A sound power level or SWL should be expressed in dB(re. 1pW). If the reference levels are omitted, it will often (but not always) be safe to assume that they are referenced to the threshold of human hearing.

A-Weighting and dB(A)

The human hearing system responds differently to different frequencies. The A-weighting system takes account of this by emphasising mid and high frequencies more than low frequencies to give an overall level. An A-Weighted noise level, therefore, reflects the way normal, healthy hearing would perceive the overall level of the noise. The basic unit is dB(A), although other systems of expressing an A-weighted level are discussed below.

Other weighting systems, such as C-Weighting, denoted dB(C), reflect the human hearing system's response at higher noise levels.

Equivalent Continuous Sound Level, L_{eq}

This is a kind of mean noise level.

The unit is dB L_{eq} . For A-weighted levels the unit is dB(A) L_{eq} or, in more modern units, dB L_{Aeq} . The Noise at Work Regulations use $L_{eq(s)}$ which refers to a sample level.

Maximum Level, L_{max}

This is the maximum level reached (usually for a fraction of a second) in the measurement period.

The unit is dB L_{max} . For A-weighted levels the unit is dB(A) L_{max} or, in more modern units, dB L_{Amax} .

Statistical (Percentile) Levels, L_n

During a measurement of fluctuating noise, it is often useful to establish the levels exceeded for a percentage of the time. L_n is the index representing the level exceeded for $n\%$ of the measurement period.

The unit is dB L_n . For A-weighted levels, the unit is dB(A) L_n or, in more modern units, dB L_{An} .

Common examples are as follows :-

dB L_{A90} is the A-weighted level exceeded for 90% of the time and is often used to describe the underlying background noise.

dB L_{A50} is the A-weighted level exceeded for 50% of the time. Mathematically, it is the median, another kind of average.

dB L_{A10} is the A-weighted level exceeded for 10% of the time and has traditionally been used to describe the intermittent highs in the noise climate such as passing cars or aircraft.

Frequency Analysis

Here the audible frequency range is divided up into bands and the noise level is expressed in each frequency band from low pitches to high pitches.

Octave Band analysis is where the frequency range is divided into 8 bands from 63 Hz to 8kHz, or sometimes into 10 bands from 31.5 Hz to 16kHz.

1/3 Octave Band analysis provides more detailed subdivision into 24 bands from 50 Hz to 10kHz, or sometimes into 30 bands from 20Hz to 20kHz.

Narrow Band analysis takes this further with the possibility of many thousands of bands, possibly only 1Hz wide, or even less.

In all types of frequency analysis, the level in each band can be expressed in terms of L_{eq} , L_{max} , L_n , etc. as defined above.

Appendix 2

Measurement and Calculation Details

Daytime Measurements

Position	Time	Index	dB(A)	63	125	250	500	1k	2k	4k	8k
1	16:23	Leq	66	53	56	58	57	57	60	59	58
		Lmax	75	63	65	71	69	67	66	68	68
		L90	61	47	50	50	50	52	55	54	52
	16:28	Leq	64	52	54	54	55	56	58	58	56
		Lmax	71	63	60	60	61	63	64	63	66
		L90	59	46	49	49	50	51	53	53	51
	16:33	Leq	67	56	58	59	61	61	60	59	57
		Lmax	81	67	72	75	77	77	72	70	70
		L90	60	47	50	50	51	53	54	54	52
	17:11	Leq	65	51	53	54	55	56	58	60	58
		Lmax	72	57	59	59	59	62	63	66	68
		L90	60	46	48	49	51	52	53	55	53
	17:16	Leq	64	51	53	54	55	56	58	58	57
		Lmax	71	58	58	62	60	63	63	64	66
		L90	60	46	48	50	51	52	53	54	52
	17:21	Leq	66	56	57	60	61	60	58	60	59
		Lmax	79	70	71	75	77	75	70	68	71
		L90	60	46	49	50	52	52	53	54	52
2	16:39	Leq	66	53	56	56	56	57	58	58	63
		Lmax	77	63	68	70	71	67	65	65	76
		L90	60	47	49	50	50	52	53	53	52
	16:44	Leq	65	53	54	54	54	57	59	59	59
		Lmax	74	65	65	61	59	65	67	66	72
		L90	60	46	48	49	50	52	54	54	52
	16:49	Leq	65	53	55	57	56	58	59	58	56
		Lmax	77	65	70	76	73	71	69	70	66
		L90	59	47	48	49	49	52	53	53	51
	17:34	Leq	65	52	54	56	59	59	59	58	57
		Lmax	77	65	69	71	75	73	67	67	67
		L90	60	45	48	49	51	52	54	53	52
	17:39	Leq	65	53	55	57	58	58	59	59	58
		Lmax	77	64	70	73	73	72	69	66	66
		L90	60	46	48	50	52	53	54	54	53
	17:44	Leq	66	53	56	57	59	59	60	59	58
		Lmax	77	66	69	75	75	72	67	67	68
		L90	61	46	48	50	52	53	55	55	53
3	16:55	Leq	66	54	55	56	57	57	60	60	59
		Lmax	73	63	62	63	67	65	67	67	68
		L90	61	47	49	50	51	53	54	55	54
	17:00	Leq	65	53	54	54	55	56	59	60	57
		Lmax	72	60	59	62	62	63	67	67	64
		L90	60	46	48	50	51	52	54	55	53
	17:05	Leq	68	54	56	61	58	60	63	60	59
		Lmax	76	64	67	74	70	69	72	67	65
		L90	62	48	50	51	52	54	57	56	55
	17:50	Leq	66	54	55	55	57	58	60	60	61
		Lmax	75	63	63	64	69	66	66	68	72
		L90	61	47	49	50	51	53	55	55	53
	17:55	Leq	66	53	54	55	56	58	60	60	59
		Lmax	72	62	63	62	64	65	66	65	66
		L90	60	46	48	49	51	53	54	54	52
	18:00	Leq	66	53	54	55	56	57	60	60	60
		Lmax	74	62	61	63	61	65	67	68	69
		L90	61	46	49	50	51	52	55	55	53

Night Time Measurements

Position	Time	Index	dB(A)	63	125	250	500	1k	2k	4k	8k
1	22:59	Leq	56	53	53	53	50	49	49	49	47
		Lmax	76	74	77	80	74	64	69	63	64
		L90	47	38	42	39	40	42	40	38	34
	23:04	Leq	59	50	50	51	54	54	51	51	50
		Lmax	74	66	65	66	70	69	65	65	61
		L90	46	36	40	38	39	42	40	38	35
	23:09	Leq	57	50	48	48	48	51	51	51	47
		Lmax	70	69	61	63	60	65	64	62	58
		L90	47	38	41	40	41	43	41	39	37
	00:06	Leq	57	51	52	54	50	50	51	49	47
		Lmax	77	75	78	81	75	66	70	64	65
		L90	46	35	39	38	37	44	37	35	34
	00:11	Leq	62	45	46	48	48	59	55	52	48
		Lmax	77	58	56	59	61	76	70	64	57
		L90	47	35	39	38	39	44	41	38	35
	00:16	Leq	57	47	47	47	49	55	48	48	44
		Lmax	74	65	61	64	64	73	63	62	58
		L90	45	34	37	36	37	43	36	34	32
2	23:18	Leq	62	55	57	58	54	54	56	54	53
		Lmax	73	61	65	65	67	63	69	65	63
		L90	51	38	42	40	41	45	46	44	41
	23:23	Leq	59	47	49	51	53	55	52	50	47
		Lmax	73	64	63	66	69	70	62	64	60
		L90	46	35	39	37	38	42	38	36	35
	23:28	Leq	62	46	46	45	46	52	49	54	60
		Lmax	74	61	56	57	54	65	58	65	73
		L90	46	35	39	37	38	42	39	37	35
	00:30	Leq	55	47	50	51	48	49	50	47	43
		Lmax	74	74	77	75	70	64	67	64	62
		L90	47	34	38	37	38	44	40	37	33
	00:35	Leq	53	42	44	43	44	48	46	47	45
		Lmax	64	56	54	55	57	57	55	57	58
		L90	46	34	38	36	36	43	37	36	34
	00:40	Leq	51	41	43	42	42	47	43	45	42
		Lmax	61	62	54	54	53	55	53	54	53
		L90	45	32	37	35	36	43	36	34	31
3	23:45	Leq	61	51	54	55	54	55	54	53	52
		Lmax	76	74	77	76	74	69	68	67	64
		L90	48	38	41	39	41	44	41	39	35
	23:50	Leq	55	44	44	44	44	46	47	50	50
		Lmax	67	59	51	54	53	56	55	60	65
		L90	45	34	38	36	36	41	38	34	32
	23:55	Leq	58	44	45	45	45	50	50	53	54
		Lmax	70	61	55	55	56	59	59	66	64
		L90	46	35	38	37	37	44	38	36	35
	00:45	Leq	54	50	54	55	47	49	48	45	43
		Lmax	73	74	77	72	71	68	64	59	58
		L90	46	32	36	34	35	44	37	34	32
	00:50	Leq	59	48	48	49	51	52	52	52	53
		Lmax	73	64	58	62	63	65	64	63	70
		L90	47	35	39	37	38	43	40	36	34
	00:55	Leq	58	50	52	52	48	49	52	51	52
		Lmax	76	72	69	71	67	67	69	69	72
		L90	45	34	39	36	37	42	39	36	32

Measurement Summary

Time	Position	Index	dB(A)	63	125	250	500	1k	2k	4k	8k
Overall Rush Hour	1	Leq	65	54	55	57	58	58	59	59	58
		Lmax	76	65	68	71	73	71	68	67	68
		L90	60	46	49	50	51	52	54	54	52
	2	Leq	65	53	55	56	57	58	59	59	59
		Lmax	77	65	69	73	73	71	67	67	71
		L90	60	46	48	49	51	52	54	54	52
	3	Leq	66	53	55	57	56	58	60	60	59
		Lmax	74	63	63	67	66	66	68	67	68
		L90	61	47	49	50	51	53	55	55	54
Overall Early Night	1	Leq	58	50	50	51	50	54	51	50	48
		Lmax	75	71	73	76	71	71	68	63	62
		L90	47	36	40	38	39	43	39	37	35
	2	Leq	59	49	51	52	50	52	51	51	53
		Lmax	72	67	69	68	66	65	64	63	66
		L90	47	35	39	37	38	43	41	39	36
	3	Leq	58	49	51	52	50	51	51	51	52
		Lmax	74	71	73	71	69	66	66	65	67
		L90	46	35	39	37	38	43	39	36	34

Required Reductions for BS8233 Guidelines

Environment	Position	Required Reductions	
		Desirable	Reasonable
Living Rooms	1	30 dB	25 dB
	2	30 dB	25 dB
	3	31 dB	26 dB
Bedrooms	1	28 dB	23 dB
	2	29 dB	24 dB
	3	28 dB	23 dB
Outdoor Living Areas	1	15 dB	10 dB
	2	15 dB	10 dB
	3	16 dB	11 dB

Mitigation Summary

Façade	Room Type	Make-Up on Which Calculations are Based
Position 1	Living Room	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: Non-acoustic eg. Simon Airstrip 300
	Bedroom	Walls: Traditional Masonry Glazing: 35 Rw, eg. 10+14+4 Vents: 42 Dn,e,w eg. Passivent TVALdB 800
Position 2	Living Room	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: Non-acoustic eg. Simon Airstrip 300
	Bedroom	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: 42 Dn,e,w eg. Passivent TVALdB 800
Position 3	Living Room	Walls: Traditional Masonry Glazing: Basic thermal eg. 4+20+4 Vents: Non-acoustic eg. Simon Airstrip 300
	Bedroom	Walls: Traditional Masonry Glazing: 35 Rw, eg. 10+14+4 Vents: 42 Dn,e,w eg. Passivent TVALdB 800

Predicted Summary

Internal	Time	Index	dB(A)	63	125	250	500	1k	2k	4k	8k
Position 1 Living Room	Rush	Leq	35	38	32	35	33	28	26	24	15
		Lmax	48	57	52	55	43	38	34	25	23
	Night	Leq	27	36	28	30	23	22	17	12	9
Position 2 Living Room	Rush	Leq	34	37	32	35	33	27	26	23	16
		Lmax	44	54	48	48	42	33	31	29	35
	Night	Leq	29	36	29	32	26	20	18	17	22
Position 3 Living Room	Rush	Leq	35	38	32	35	32	27	27	25	17
		Lmax	45	57	52	51	42	34	32	27	29
	Night	Leq	27	35	30	32	23	19	17	13	13

External	Time	Index	dB(A)	63	125	250	500	1k	2k	4k	8k
Position 1	Rush	Leq	55	48	50	51	51	49	48	45	41
Position 3	Rush	Leq	55	48	49	50	49	49	49	46	43