

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266



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Report Title:	Vehicle Noise Assessment to 29 and 31 Blenheim Road, Caversham		
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Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

Contents

1.0	Introduction	1
2.0	Reading Borough Council Policies DM4 and CS34	1
2.1	Reading Borough Council Policy DM4:	1
2.2	Reading Borough Council Policy CS34	2
3.0	Site description	2
4.0	Existing Noise Climate	3
4.1	Road Traffic	3
4.2	Rail Traffic	3
4.3	Aircraft	3
4.4	Mechanical Noise Sources	3
4.5	Other sources	3
5.0	Environmental Noise Survey	3
5.1	Measurements	3
5.2	Weather during survey period	4
5.3	Instrumentation	4
5.4	Results	4
6.0	Prediction of Noise Affecting Numbers 29 and 31 Blenheim Road	5
6.1	Method	5
6.2	Predicted LAeq noise levels at 29 and 31 Blenheim Road	7
7.0	Guidance on Assessment of Noise Levels	10
7.1	Noise Policy Statement for England (NPSE) March 2010	10
7.2	National Planning Practice Guidance – Noise (August 2013)	11
7.3	World Health Organisation	12
7.4	BS 8233:2014: “Guidance on sound insulation and noise reduction for buildings”	14
8.0	Assessment of Impact	15
8.1	Tolerance	16
9.0	Summary and Conclusions	16

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

Table 1: Summary of noise levels for typical vehicle arrival / departure.....	7
Table 2: Summary of noise levels for typical vehicle manoeuvring onto a car park space	7
Table 3: Noise exposure hierarchy	11
Table 4: WHO Guideline values for community noise in specific environments.....	12
Figure 1: Proposed layouts	2
Figure 2: Graphical Survey Data.....	5
Figure 3: Screenshot of isometric view of acoustic model.....	6
Figure 4: Daytime $L_{Aeq1hour}$ noise levels predicted at 29 and 31 Blenheim Road due to vehicle arrivals and vehicle manoeuvring into parking spaces	7
Figure 5: Night-time $L_{Aeq1hour}$ noise levels predicted at 29 and 31 Blenheim Road	8
Figure 6: WHO effects of different levels of night noise on the population's health	13
Figure 7: Indoor ambient noise levels for dwellings (from BS8233:2014, Table 4)	14
Figure 8: DEFRA NANR16 Summary of findings	15

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

1.0 Introduction

It is proposed to develop land to the west of 29 and 31 Blenheim Road Caversham, to provide 5 new residential dwellings. As part of the pre-application advice provided by the local planning authority (Reading Borough Council [RBC]) has indicated concerns regarding noise and disturbance from the proposed access road to numbers 29 and 31 Blenheim Road. RBC go on to advise that there is a requirement for Any application to demonstrate how it would mitigate this significant issue (conflict with Policies DM4 and CS34) which has been considered a reason for refusal on the two previous applications and also referred to in the Planning Inspectorates decision when dismissing the appeal for application ref. 99/0482.

Paragon Acoustic Consultants has been commissioned to assess the predicted noise levels associated with the vehicular traffic that is likely to be associated with the occupiers of the proposed new properties. The following Sections detail the methods of assessment and the predictions of noise at numbers 29 and 31 Blenheim Road.

2.0 Reading Borough Council Policies DM4 and CS34

Reading Borough Council Policies DM4 and CS34 are considered. The Policies are reproduced in the following Sections

2.1 Reading Borough Council Policy DM4:

DM4: SAFEGUARDING AMENITY

Development will not cause a significant detrimental impact to the living environment of existing or new residential properties, in terms of:

- Privacy and overlooking;
- Access to sunlight and daylight;
- Visual dominance and overbearing effects of a development;
- Noise and disturbance;
- Artificial lighting;
- Vibration;
- Dust and fumes;
- Smell; or
- Crime and safety.

The position of habitable rooms, windows and outdoor living spaces will be particularly important. A back-to-back distance of 20 metres between dwellings is usually appropriate, although the circumstances on individual sites may enable dwellings to be closer without a detrimental effect on privacy.

As well as immediate impacts, other aspects to which this policy applies will include matters such as hours of operation of businesses, and effects of traffic movements, particularly of heavy goods vehicles (HGVs). Proposals which would generate regular movements of HGVs on residential roads will not be acceptable.

Where an otherwise acceptable development could change its character to a use that would have a greater impact on amenity without needing planning permission, conditions will be applied to restrict such changes.

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

2.2 Reading Borough Council Policy CS34

Reading Borough Local Development Framework Core Strategy Adopted January 2008 (With Alteration Adopted 27th January 2015) gives Policy CS34 as follows:

Policy CS34: Pollution and Water Resources

Development will only be permitted where it would not be damaging to the environment through air, land, noise or light pollution; where it would preserve or ideally enhance ground and surface water quality; and where existing water resources, sewerage and wastewater treatment infrastructure are adequate to support the proposed development.

Proposals for development that are sensitive to the effects of air, noise or light pollution will only be permitted in areas where they will not be subject to high levels of such pollution, unless adequate mitigation measures are provided to minimise the impact of such pollution.

Development will be permitted on land affected by contamination where it can be demonstrated, to the satisfaction of the LPA, that the contamination can be satisfactorily remediated so that it is suitable for the proposed end use.

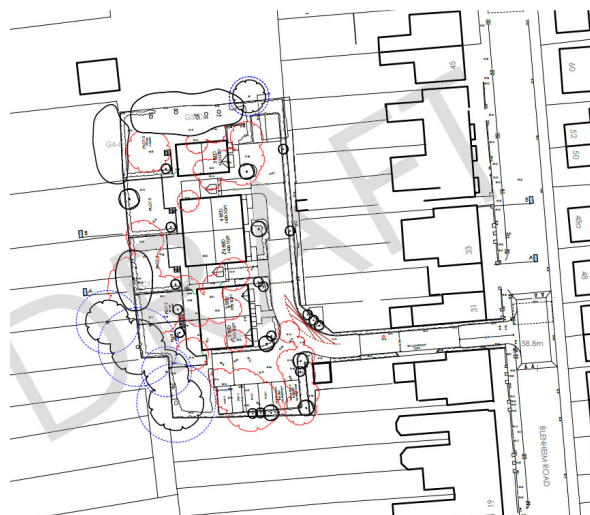
11.16The Environmental Protection background paper has highlighted that there are pockets of poor air quality within Reading caused by vehicles emissions, and that some ground and surface waters are experiencing a degree of pollution. It is therefore important to ensure that future development does not result in any further deterioration of air and water quality and where possible, results in an improvement in overall quality. In line with the predicted level of new development within Reading, it will be important to ensure that this does not place an undue burden on existing water resources or result in a deterioration in potential yield of surface and ground water resources. In order to improve the quality of life of those living and working within Reading, it is important to avoid any detrimental impact from development in the form of noise and light pollution.

11.17The Environmental Protection background paper has highlighted that land affected by contamination does exist within the Borough as a result of previous land uses. In order to make the most effective use of previously developed land within Reading, it will be important to ensure that, where possible, such land is remediated through the development process so that it is suitable for redevelopment.

3.0 Site description

The location of the proposed building layouts is illustrated on the site plan as shown below:

Figure 1: Proposed layouts



Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

4.0 Existing Noise Climate

In order to establish the existing noise climate this practice undertake environmental survey works between 23rd July 2018 and 24th July 2018. The results of the surveying are provided as follows:

4.1 Road Traffic

Noise emanating from vehicular road traffic was deemed to provide a contribution to the ambient noise climate proximal to the nearest affected residential premises. The overall noise comprises both individual “event” type emissions from vehicles passing along local roads, and also continuous low frequency “rumble” due to middle distance traffic flows.

4.2 Rail Traffic

Rail traffic was not observed during the manned period at the start and end of the survey.

4.3 Aircraft

Aircraft over flights were observed sporadically during the manned survey at the start and end of the period. Their contribution to the background noise climate will have been included within the measurements taken.

4.4 Mechanical Noise Sources

No mechanical noise sources were observed at the site.

4.5 Other sources

During the manned period of the survey some construction associated noise was noted.

5.0 Environmental Noise Survey

5.1 Measurements

The noise monitoring took place between the following dates / times:

- Start : 23/07/2018 at 09:44 hours
- End : 24/07/2018 at 11:57 hours

The noise monitoring was generally un-manned and was undertaken at the location as described below.

- **MP1:** At the rear of 31 Blenheim Road, 1 metre external to the first floor window.

The measurement location is illustrated on the site layout drawing in Appendix A.

Various statistical broad-band and spectral sound pressure level measurements were obtained during the survey. A measurement time interval $T_m = 5$ minutes was used for sampling. Measurements of the percentile level $L_{A90,T}$ were made using time weighting F as per clause 3.4 of BS 4142:2014.

The quantities recorded included:

- **L_{Aeq} :** the equivalent continuous A-weighted sound pressure level over the measurement period
- **L_{Amax} :** the maximum A-weighted sound pressure level for the measurement period

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

- **L_{A10}**: the A-weighted sound pressure level exceeded for 10% of the measurement period
- **L_{A90}**: the A-weighted sound pressure level exceeded for 90% of the measurement period

5.2 Weather during survey period

The weather conditions at the start of the manned period of the survey were dry and hot with a slight breeze. At the end of the survey the weather conditions were similar. The weather forecast did not indicate that adverse weather conditions would occur for the survey duration.

5.3 Instrumentation

Sound pressure level measurements were obtained using the following instrumentation complying with the Type 1 specification of BS EN 60804, BS EN 60651, BS EN 60942, BS EN 61260, and BS EN 61672-1:

- Norsonic Type 118 Sound level analyser, serial number 31990
- Norsonic Type 1225 ½" microphone

Additionally, the following equipment was used:

- Weather protection kit
- NOR 1212 microphone outdoor protection kit
- Tripod

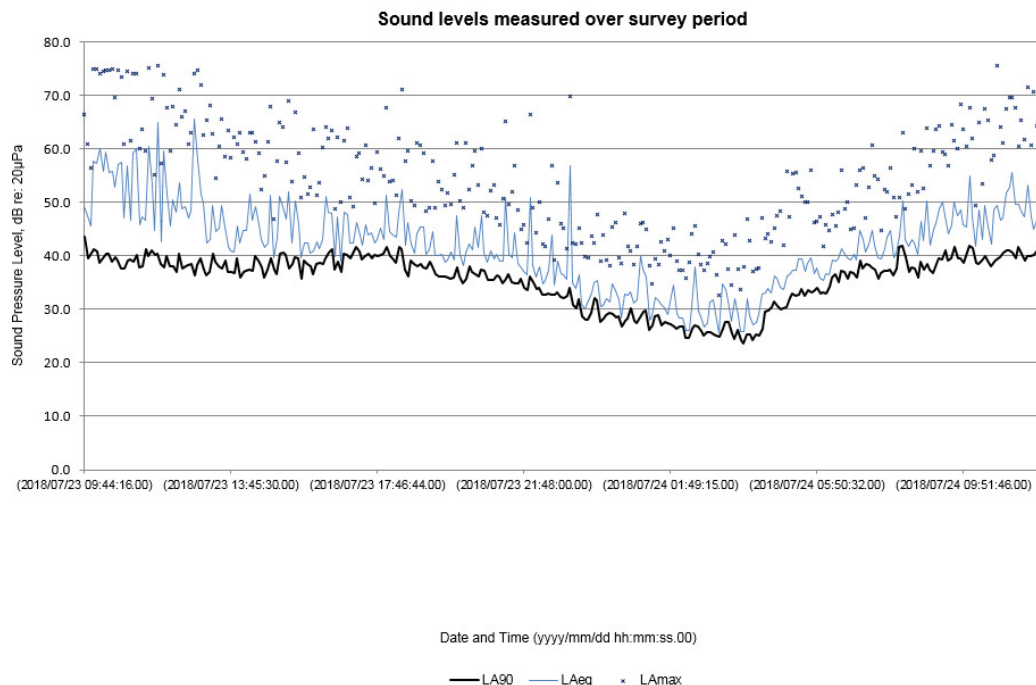
Calibration checks were made prior to and after completion of measurements using a Norsonic Type 1251 acoustical calibrator complying with Class 1 of BS EN 60942, calibration level 114.0 dB ± 0.3 dB, @ 1.0 kHz. All instrumentation carries a current manufacturer's certificate of conformance a copy of which is available upon request.

5.4 Results

The recorded survey data is shown within Appendix B. Broadband sound pressure level data over the survey period (L_{A90} background levels, L_{Aeq} and L_{Amax} measurements) are shown graphically below:

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

Figure 2: Graphical Survey Data



6.0 Prediction of Noise Affecting Numbers 29 and 31 Blenheim Road

6.1 Method

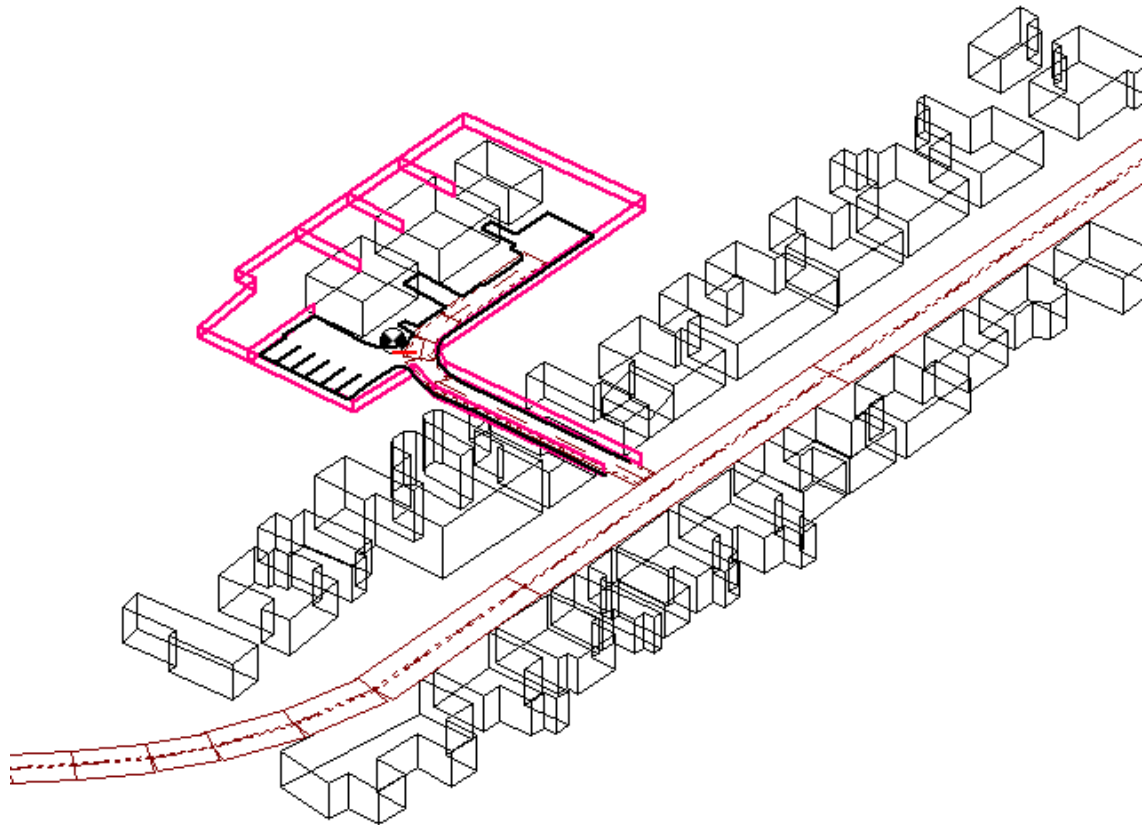
The prediction of noise levels affecting the properties of numbers 29 and 31 Blenheim Road is based on in-house data for vehicular traffic movements and manoeuvres into parking spaces. The assessment scenario assumes the following:

- A likely worst case hour during daytime and night-time periods.
- During daytime, an estimated 10 vehicle movements per hour associated with the occupants of the proposed development (based on two cars per household departing / arriving in any hour period [The Royal Automobile Club Foundation for Motoring "Car ownership in Great Britain" document graph suggests <1.4 cars per household predicted for 2018])
- During night-time, an estimated 4 vehicle movements per hour associated with the occupants of the proposed development

In order to quantify any impacts associated with the proposals, a detailed three dimensional computer model of the locality has been constructed using CADNA A software, Figure 3 isometric illustrating the "proposed case", which implements the procedures contained in relevant documents such "Calculation of Road Traffic Noise", ISO 9613-2: "Acoustics - Abatement of sound propagation outdoors, Part 2: General method of Calculation" etc.. For the calculation purposes, two orders of mirror source reflection have been allowed for using ray tracing as experience has shown that this approach accurately models noise propagation in situations where multiple plane reflecting surfaces are present.

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

Figure 3: Screenshot of isometric view of acoustic model



The model assumes 1.8m high boundary fencing at the development highlighted as red line in the above isometric view.

The vehicle noise can effectively be modelled as two elements;

- Vehicle arrival / departure
- Parking manoeuvres.

The assumed path taken by the vehicles has been modelled as a series of straight-line segments to approximate the path travelled by the vehicle. Vehicle noise emissions for arrivals and departures respectively have been assumed as constant and independent of vehicle speed, since tyre noise is not significant in comparison to noise from the engine and exhaust at the types of vehicle speed likely to be encountered. Calculations assume point source radiation as the vehicle travels along each segment to the parking space, then a point source and appropriate corrections applied to account for the estimated average time of manoeuvring into a parking space of 20 seconds (although this is likely to be somewhat pessimistic).

The assessment processes sample vehicle noise levels to provide hourly L_{Aeq} levels, with corrections applied to the numbers of cars predicted in the worst case hour. The in-house data for access road car movements is confirmed as follows:

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

Table 1: Summary of noise levels for typical vehicle arrival / departure

Activity	1/1 Octave band Sound Pressure level dB re: 20µPa							
	63	125	250	500	1k0	2k0	4k0	8k0
Energy average of sample car movements over approximately 50m distance at 3m from nearest point (7 sec) dB L _{eq}	68	60	56	55	54	51	47	51

In house data for car parking manoeuvres is confirmed as follows:

Table 2: Summary of noise levels for typical vehicle manoeuvring onto a car park space

Activity	1/1 Octave band Sound Pressure level dB re: 20µPa							
	63	125	250	500	1k0	2k0	4k0	8k0
Energy average of sample car manoeuvres - parking at 3m from highway (20 sec) dB L _{eq}	66	61	60	61	59	59	58	54

The sound pressure level data set out in Tables 1 & 2 above have been used as input emission values to produce dB L_{Aeq,1h} noise levels at the dwellings under consideration.

6.2 Predicted LAeq noise levels at 29 and 31 Blenheim Road

The following screenshots provide to illustrate the acoustic model prediction of noise from vehicular movement affecting 29 and 31 Blenheim Road:

Figure 4: Daytime L_{Aeq1hour} noise levels predicted at 29 and 31 Blenheim Road due to vehicle arrivals and vehicle manoeuvring into parking spaces

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266



Figure 5: Night-time $L_{Aeq1hour}$ noise levels predicted at 29 and 31 Blenheim Road



The output from the acoustic model indicates that the highest $L_{Aeq1hour}$ noise levels will be experienced at 1m external to the 29 / 31 Blenheim Road, with predicted values of 43/44 dB during the daytime and 38/39 dB during the night-time due to vehicular arrival and departure movements and manoeuvring / parking associated with proposed Site.

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

It is noted that the part of the eastern facades of 29 / 31 Blenheim Road incorporate blind facades and as a result these have been excluded from the assessment.

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

7.0 Guidance on Assessment of Noise Levels

7.1 Noise Policy Statement for England (NPSE) March 2010

The Government published the Noise Policy Statement for England (NPSE) in March 2010, with the aim of providing clarity regarding current policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level.

The aims of the Government's noise policy are:

Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- 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.

The terms "quality of life" and "wellbeing" are often used interchangeably in the assessment of noise effects.

In its aims, the Policy uses the key phrases "Significant adverse" and "adverse". In clarifying what these mean the Policy notes that "...there are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the WHO. They are:

NOEL – No Observed Effect Level: This is the level below which no effect can be detected. 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."

The Policy extends these concepts to include:

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

It is further noted that NPSE should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise.

The Policy notes that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is for a project to identify relevant SOAELs taking account the different sources of exposure and different receptors.

It can be seen that the test of significance in relation to government policy is a question of degree, and that a significant noise level will be somewhere above a level where the onset of adverse effect might be expected - i.e. SOAELs will always be greater in magnitude than LOAELs and LOAELs are greater than NOELs. In other words, as exposure to a sound source increases, there will start to be some level of effect on a receptor, and, as the exposure increases, the severity of the effect or effects increase with further increase in exposure to the level where the effect becomes significant.

It is also worth noting that the second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. The aim is that "all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur."

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

7.2 National Planning Practice Guidance – Noise (August 2013)

Noise needs to be considered when new developments would be sensitive to the prevailing acoustic environment. When determining noise impact, Local Authorities' plan making and decision taking should take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is occurring or is likely to occur;
- Whether or not an adverse effect is occurring or is likely to occur; and
- Whether or not a good standard of amenity can be achieved

The practice guidance sets out a noise exposure hierarchy, based on four principal factors; perception, examples of outcomes, increasing effect level and actions, thus:

Table 3: Noise exposure hierarchy

Perception	Example of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up the volume of the television speaking more loudly, closing the windows for some time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a significant change in behaviour and/or attitude, e.g. having to keep windows closed for most of the time, avoiding certain activities during the periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening: loss of appetite, significant, medically definable harm e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact of those affected. This will depend on how factors combine in any particular situation, including:

- the source and absolute level of the noise together with the time of day it occurs;
- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- the spectral content of the noise and its general character (whether the noise contains particular tonal characteristics or other particular features).

More specific factors to consider, when relevant, include:

- where applicable, the cumulative effect of more than one noise source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration;
- consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases, a suitable alternative means of ventilation is likely to be necessary.

In respect of mitigating noise, the approach to be adopted will depend on the nature of the development and the character of the location.

7.3 World Health Organisation

The World Health Organisation (WHO) document “Guidelines for Community Noise” provided a review of the effects of noise and a description of the principles of health criteria.

The WHO document presents guideline values arranged according to specific environments and critical health effects. Noise indices to be adopted and the accompanying time base to be used for the assessment are also presented.

The guideline values consider all health effects for a specific environment. An adverse health effect refers to any temporary or long-term impairment of physical, psychological or social functioning associated with noise exposure.

The specific noise limits were set for each health effect “using the lowest noise level that produces an adverse health effect”

Table 4: WHO Guideline values for community noise in specific environments

Specific environment	Critical health effect(s)	L _{Aeq} (dB)	Time base (hours)
Outdoor living area	Serious annoyance, daytime and evening	55	16
	Moderate annoyance, daytime and evening	50	16
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime and evening	35	16
	Sleep disturbance, night time	30	8

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

For the daytime level, the WHO Guidelines for Community Noise identifies guideline values to assess typical community annoyance with 50 or 55 dB L_{pAeq} [outdoor noise level] representing “daytime levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed, respectively.” On this last matter, page 144 of the Community Noise guidelines states that “Available data indicate that daytime sound pressure levels of less than 50 dB L_{pAeq} cause little or no serious annoyance in the community”.

The dose response curves on page 100 of the document suggest about 5% of the population is annoyed at 55 dB - i.e., the majority referred to in the annoyance guideline value is about 95% of the population.

Table 5.4 of World Health Organisation document “Night Noise Guidelines for Europe” provides details of the health effects observed in the population based on the average night noise level over a year $L_{night,outside}$, reproduced as follows:

Figure 6: WHO effects of different levels of night noise on the population’s health

Average night noise level over a year $L_{night,outside}$	Health effects observed in the population
Up to 30 dB	Although individual sensitivities and circumstances may differ, it appears that up to this level no substantial biological effects are observed. $L_{night,outside}$ of 30 dB is equivalent to the NOEL for night noise.
30 to 40 dB	A number of effects on sleep are observed from this range: body movements, awakening, self-reported sleep disturbance, arousals. The intensity of the effect depends on the nature of the source and the number of events. Vulnerable groups (for example children, the chronically ill and the elderly) are more susceptible. However, even in the worst cases the effects seem modest. $L_{night,outside}$ of 40 dB is equivalent to the LOAEL for night noise.
40 to 55 dB	Adverse health effects are observed among the exposed population. Many people have to adapt their lives to cope with the noise at night. Vulnerable groups are more severely affected.
Above 55 dB	The situation is considered increasingly dangerous for public health. Adverse health effects occur frequently, a sizeable proportion of the population is highly annoyed and sleep-disturbed. There is evidence that the risk of cardiovascular disease increases.

NPSE clarifies the difference between NOEL and LOAEL as used in the Night Noise Guidelines for Europe, which gives values of 30dB & 40dB for the night-time average level measured outside dwellings respectively. This indicates that there may be no significant benefit in achieving an average level of less than around 40dB outside dwellings during the night.

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

7.4 BS 8233:2014: “Guidance on sound insulation and noise reduction for buildings”

BS 8233:2014 deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations.

Indoor ambient noise levels for dwellings are set out at Section 7.7.2, Table 4, reproduced below:

Figure 7: Indoor ambient noise levels for dwellings (from BS8233:2014, Table 4)

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 $L_{Aeq,8hour}$

A series of notes provide context to the guideline values of Table 4 within BS8233:2014

Note 1 advises that the indoor ambient noise levels are “the sum total of structure-borne and airborne noise sources. Groundborne noise is assessed separately and is not included as part of these targets, as human response to groundborne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.”

Note 3 states “These levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year’s Eve.”

Note 7 provides a rider to the guideline values of Table 4, “Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved”.

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

8.0 Assessment of Impact

It is considered reasonable to assess the absolute L_{Aeq} noise levels predicted due to vehicular movements against the guidance of WHO / BS8233 in order to determine whether or not the occupants of 29 and 31 Blenheim Road would suffer loss of amenity.

Within Section 6.2 of this report, it has been predicted that dB L_{Aeq} 1 hour noise levels at 1 metre from the façades of 29/31 Blenheim Road would be 43/44 dB during daytime and 40/41 dB during night-time respectively.

In a research study conducted for DEFRA NANR116: "Open/Closed Window Research", numerous references are provided which quantify losses through open and partially open windows:

Figure 8: DEFRA NANR16 Summary of findings

Information Source	Summary of Findings
PPG 24 (1994) ^[2]	A reduction of 13 dB(A) from the facade level is assumed for an open window
WHO (1999) ^[4]	A reduction of 15 dB from the facade level is assumed for a partially open window. (no reference)
BS 8233 (1999) ^[5]	Windows providing rapid ventilation and summer cooling are assumed to provide 10 - 15 dB attenuation (no specific reference)
BRE Digest 338 (1988) ^[6]	A partly open window has an averaged level difference, $D_{1m;100-3150}$ of 15 dB
DoE Design Bulletin 26 (1972) ^[7]	A reduction of 5 dB(A) with a window wide open
Nelson - Transportation Noise (1987) ^[8]	Sound insulation of an open single window is 5 – 15 dB. (theoretical)
Mackenzie & Williamson DoE Report (1972-73) ^{[9],[10]}	A vertical sliding sash window open 0.027 m ² (summer night-time ventilation) and 0.36 m ² (daytime summer ventilation) provided a sound level reduction of 16 and 11 dB(A) respectively. (Lab Study)
Kerry and Ford (1973 – 74) ^{[11],[12]}	A horizontal sliding sash window open 25 mm and 200 mm provided averaged sound reduction indices, R_{av} of 14 and 9 dB respectively. (Field Study)
Lawrence and Burgess (1982 – 83) ^{[13],[14]}	A vertical sliding sash open 9% of the total façade provided a sound reduction index R_w 10 dB. (Field study)
Hopkins (2004) ^[15]	Road traffic noise reductions through window openings resulted in reductions of between $D_{2m,n,T}$ 8 and 14 dB. (Field Study)

Table 1.1 Summary of open-window acoustic transmission literature

The findings of the study are referenced in this report to substantiate the use of a 10 dB loss through a partially open window. The calculated internal noise levels within the dwelling of 29/31 Blenheim Road would therefore be 34 dB & 29 dB during day and night-time respectively.

The LOAEL values for internal noise levels would be considered to be 35 dB for daytime and 30 dB for night-time. Therefore, since the calculated noise levels are below LOAEL values, it is considered that noise due to vehicular movements associated with the proposed development is unlikely to cause loss of amenity to the occupants of 29/31 Blenheim Road.

Project:	29/31 Blenheim Road, Caversham	Date:	31/07/2018
Client:	First Avenue Estates Ltd	Ref:	4266

With regards to LA_{max} noise levels The World Health Organisation (WHO) document “Guidelines for Community Noise” provided a review of the effects of noise and a description of the principles of health criteria. For noise events, the guideline value was set at 45 dB LpA_{max}, inside bedroom, with research cited in the text advising that this value should not be exceeded by more than 10 to 15 times per night to ensure “good sleep”. With the potential limited amount of vehicle movements expected during the night time period that would impinge on the western elevations of the proposed development it is considered likely that the vehicle movements will be below 10 per night. At the front of the property the buildings are subject to existing passing traffic noise levels. It is considered that the LA_{max} values of any vehicular traffic associated with the new development would be no worse than existing vehicle LA_{max} values impinging on the properties, especially considering that both properties incorporate blind walls on the majority of the eastern elevations of the properties that face the proposed access route.

8.1 Tolerance

Acoustic surveys are subject to a relatively small degree of uncertainty, as there is always the potential for vehicular movements to vary slightly, together with the other noise sources that contribute to the noise levels obtained.

There are also numerous tolerance associated with the sound data used, such as the type of vehicle using the parking provision of the new development site, the amount of time taken to execute parking manoeuvres, driver competence etc..

Whilst this practice will follow due process and use the noise data at face value, it is advised that in practice the prediction of noise levels may be subject to a tolerance of +/- 3dB, and possibly greater under certain circumstances.

9.0 Summary and Conclusions

Using in-house vehicle movement noise levels for source data, CadnaA acoustic modelling software has been used to predict the noise levels affecting the properties of 29 and 31 Blenheim Road Caversham.

The Local Authority has raised concerns regarding possible noise and disturbance from the proposed access road to numbers 29 and 31 Blenheim Road, however, predictions show that when comparing the predicted internal noise levels to LOAEL values derived from authoritative design guidance at the affected property it is very unlikely that the occupiers of 29/31 Blenheim Road areas of the affected property would suffer loss of amenity.

On the basis of this assessment it is considered that reservations from the Local Planning Authority on the grounds of noise from vehicular movements have been addressed and should not be a reason for planning refusal.