

**PROPOSED RESIDENTIAL DEVELOPMENT AT
LAND OFF WORKHOUSE LANE, BURBAGE**

NOISE ASSESSMENT

On behalf of:
Central Midlands Estates Ltd

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LAND OFF WORKHOUSE LANE, BURBAGE**

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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned to carry out a noise assessment relating to a proposed residential development at a site known as Land off Workhouse Lane, Burbage, Leicestershire.
- 1.2 The site is currently an open field and is bounded by Workhouse Lane to the northeast, by existing residences to the northwest and, generally, by open fields to all other sides, plus a further existing residence to the southeast.
- 1.3 Workhouse Lane is a no-through road that carries very limited amounts of traffic.
- 1.4 The M69 motorway runs southeast/northwest at a distance of about 300m southeast from the closest part of the site, across intervening land predominantly of open fields.
- 1.5 A site plan is provided in Figure 1.
- 1.6 The various noise units and indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 ACOUSTIC CRITERIA

- 2.1 The *National Planning Policy Framework (NPPF)* 2019 states at paragraph 170 that “*Planning policies and decisions should contribute to and enhance the natural and local environment by: ... e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of ... noise pollution ...*”.
- 2.2 Further, paragraph 180 states that “*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life ...*”.
- 2.3 However, there is as yet no specific guidance on numerical acoustic assessment/design criteria for proposed new housing developments provided in the NPPF, accompanying Technical Guidance document, National Planning Practice Guidance ‘Noise’, nor the NPSE.

ProPG: Planning & Noise

- 2.4 ProPG: Planning & Noise ‘*Professional Practice Guidance on Planning & Noise*’ 2017 provides “guidance on a recommended approach to the management of noise within the planning system in England”, predominantly for proposed new residential developments on land that is exposed to transportation noise.
- 2.5 It is noted that the guidance has no legal status. It does not constitute an official government code of practice and does not provide an authoritative interpretation of the law or government policy.
- 2.6 The ProPG recommends a staged approach to assessment. Stage 1 is an initial site noise risk assessment, indicating whether the proposed site is considered to pose a negligible, low, medium or high risk from a noise perspective.
- 2.7 At low noise levels, the more likely the site is to be acceptable from a noise perspective provided that a good acoustic design process is followed and an ADS (Acoustic Design Statement) confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.

- 2.8 As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and an ADS confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.
- 2.9 High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS.
- 2.10 Stage 2 of the recommended approach in ProPG is a full assessment to consider good acoustic design. The guidelines of ProPG in terms of suitable acoustic design criteria are broadly consistent with (and essentially adopted from) the guidance of BS 8233, and the sound insulation recommendations made later in this report have been designed to achieve the BS 8233 guidelines, as described below.

BS 8233

- 2.11 British Standard 8233: 2014 *Guidance on sound insulation and noise reduction for buildings*, which carries the full weight of an adopted British Standard, recommends guidance on design criteria for acceptable noise levels within residential accommodation. BS 8233 guidelines for the daytime (0700-2300hrs) and night-time (2300-0700hrs) periods are summarised in Table 1.

Table 1 : BS 8233 Recommended Acoustic Design Criteria

Activity	Location	Internal Noise Levels	
		Daytime 0700-2300hrs	Night-time 2300-0700hrs
Resting	Living room	35 dB LAeq,16hr	-
Dining	Dining room / area	40 dB LAeq,16hr	-
Sleeping (daytime resting)	Bedroom	35 dB LAeq,16hr	30 dB LAeq,8hr

- 2.12 BS 8233 states that the above levels are based on annual average data and do not have to be achieved in all circumstances.
- 2.13 BS 8233 also states that, “*where development is considered necessary or desirable ... the internal target levels [i.e. those in Table 1] may be relaxed by up to 5dB and reasonable internal conditions still achieved*”.

- 2.14 BS 8233 clarifies that the above guidance relates only to noise without specific character (e.g. such as that which has a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content) and that where such characteristics are present, lower noise limits might be appropriate.
- 2.15 Further, BS 8233 states that if there is a reliance on closed windows to meet the guide values, *“there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level”*. Further, it is stated that assessments should be based on a room with *“adequate ventilation provided (e.g. trickle ventilators should be open)”*.
- 2.16 BS 8233 also recognises that regular individual noise events at night can cause sleep disturbance. Peaks of noise from individual events are usually described in terms of L_{Amax} values and these can be highly variable and unpredictable. ProPG states that *“in most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events”*.
- 2.17 Regarding outdoor living areas, BS 8233 states that *“it is desirable that the external noise level does not exceed 50dB $L_{Aeq,T}$ with an upper guideline value of 55dB L_{Aeq} , which would be acceptable in noisier environments. However, it is recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas such as city centres or urban areas adjoining the strategic transport network, compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, developments should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited”*.

3.0 NOISE SURVEY

- 3.1 Noise monitoring was undertaken at the site over a continuous 48-hour period commencing at 1500hrs on Wednesday 18 September 2019 at a location towards the southernmost part of the site. The measurement location is identified in Figure 1.
- 3.2 The noise monitoring was undertaken using a Norsonic 140 Type 1 Integrating Sound Level Meter (serial no. 1406529). Calibration checks were carried out using a Bruel & Kjaer Acoustic Calibrator, Type 4231 (serial no. 2389221) before and after the survey, and no variation in calibration level was observed.
- 3.3 The measurement microphone was fitted with a windshield and mounted in 'free-field' conditions at about 2.5m above local ground.
- 3.4 Weather conditions during the survey were generally dry and warm. For the majority of the 48-hour noise monitoring period, wind speeds were very low, typically ~1m/s. Over the first 24-hours the wind direction was generally northerly, albeit fluctuating, whereas over the second 24-hours the wind direction was generally south-easterly. Wind speeds increased slightly towards the end of the survey period.
- 3.5 Therefore, over the latter 24-hours period, there was a direct positive wind vector from the M69 towards the site. These conditions were specifically selected for the noise survey to demonstrate worst-case conditions in terms of motorway noise. The earlier period was also included to demonstrate conditions at other times.
- 3.6 Motorway noise was found to be the dominant noise source at the site.
- 3.7 The actual daytime $L_{Aeq,16hr}$ and night-time $L_{Aeq,8hr}$ noise exposure levels for each 24-hour period have been obtained from the logarithmic average of all measured $L_{Aeq,5min}$ noise measurement samples over each of those periods at each location.
- 3.8 All measured noise levels are fully detailed in Appendix II. Overall noise levels are presented in Table 2.

Table 2 : Overall Daytime and Night-time Noise Levels

24-hour Period (both 1500hrs – 1500hrs)	Daytime (0700-2300hrs)	Night-time (2300-0700hrs)	
	dB LAeq,16hr	dB LAeq,8hr	dB LAmax
18-19 September 2019	53	54	57-71
19-20 September 2019	59	57	59-78
Overall	57	55	57-78

- 3.9 The overall noise levels set out in Table 2 fall generally into the 'low' risk category as set out in the Stage 1 guidance of ProPG during the daytime, and the 'low' to 'medium' risk category during the night-time.

4.0 NOISE ASSESSMENT & RECOMMENDATIONS

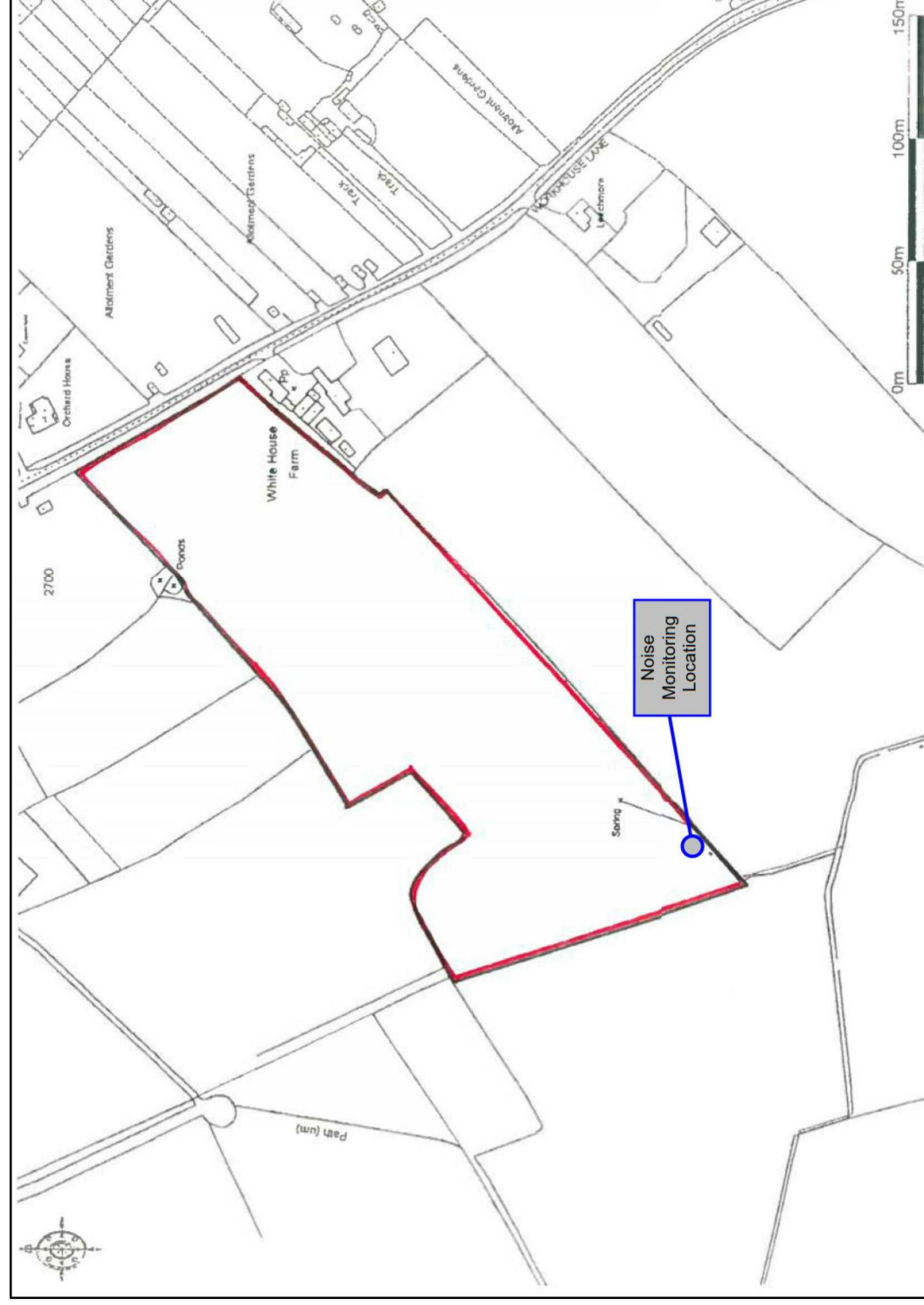
- 4.1 Based on the noise levels set out in Table 2 and the acoustic criteria outlined in Section 2.0, it is not necessary to incorporate any specific noise mitigation measures to control internal noise levels for the proposed development.
- 4.2 Based on the overall daytime $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ noise level measurements, standard thermal double glazing and traditional external wall and roof constructions, along with standard non-acoustic trickle ventilators, will be adequate to ensure internal noise levels within the targets set out in BS 8233 / ProPG.
- 4.3 Based on the measured daytime $L_{Aeq,16hr}$ noise level measurements at the closest site location to the M69, noise levels in exposed external amenity areas (i.e. gardens) will vary according to wind conditions, especially direction, and will range from levels within the guideline values of BS823 to levels potentially exceeding those values by about 4dB.
- 4.4 Given that the BS 8233 guideline values set out in Table 1 are to be based on the annual average, rather than any specific individual worst-case day, it is considered most appropriate and robust to assess external noise levels based on the overall noise levels measured over the full 48-hour noise monitoring period. In particular, it is noted that the worst-case wind direction at the site is directly from the southeast, and that this is a relatively infrequent mode in England.
- 4.5 Notwithstanding an inevitable degree of uncertainty, attributable to the fluctuations in motorway noise at a distance such as that relevant here, due to wind conditions, this indicates a typical daytime noise level that is 2dB over the '*upper guideline level*' of BS 8233.
- 4.6 It is generally accepted that a 2dB exceedance of the '*upper guideline level*' of BS 8233 would not be perceptible (i.e. compared to just meeting that standard) and hence may be considered insignificant.
- 4.7 Further, due to the distance separation and other existing attenuation factors, it is not considered likely that simple acoustic fencing will have a substantial effect, unless of a height atypical of normal garden fencing.

- 4.8 Accounting for all of the above, and also the full provisions of BS 8233 summarised in paragraph 2.17 of this report, it is recommended that no specific noise mitigation measures are necessary to adequately control external noise in gardens. Nonetheless, an optimised layout would minimise (so far as practicable accounting for other design and planning constraints) the number of gardens towards the southernmost boundary areas of the site, instead, where possible, positioning the gardens behind the houses such that the buildings themselves act as substantial acoustic screens.

5.0 SUMMARY AND CONCLUSIONS

- 5.1 Hepworth Acoustics has undertaken a noise assessment relating to a proposed planning application for residential development at a site known as Land off Workhouse Lane, Burbage, Leicestershire.
- 5.2 A noise survey has been undertaken at the site and daytime and night-time noise levels have been determined.
- 5.3 Based on the results of the noise survey, the overall noise levels at the site fall generally into the 'low' risk category as set out in the Stage 1 guidance of ProPG during the daytime, and the 'low' to 'medium' risk category during the night-time.
- 5.4 It has hence been determined that no specific mitigation measures are necessary at the proposed development in order to achieve appropriate internal and external noise levels at the proposed dwellings, but that, where possible, it will be preferable to minimise the number of gardens towards the southernmost boundary areas of the site, instead, where possible, positioning the gardens behind the houses, which will act as substantial acoustic screens.

Figure 1 : Site Plan



Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kiloHertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

- L_{Aeq}** This is the A-weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A-weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.
- L_{Amax}** This is the maximum A-weighted noise level that was recorded during the monitoring period.
- L_{A10}** This is the A-weighted noise level exceeded for 10% of the time period. L_{A10} is usually used as a measure of traffic noise.
- L_{A90}** This is the A-weighted noise level exceeded for 90% of the time period. L_{A90} is used as a measure of background noise

Appendix II: Noise Survey Results

Date	Time		Noise Level dB			
	Start	End	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
18/09/2019	15:00	15:15	49	66	51	45
18/09/2019	15:15	15:30	46	52	47	44
18/09/2019	15:30	15:45	48	65	49	45
18/09/2019	15:45	16:00	47	60	48	45
18/09/2019	16:00	16:15	48	64	49	45
18/09/2019	16:15	16:30	47	60	48	45
18/09/2019	16:30	16:45	47	60	48	45
18/09/2019	16:45	17:00	47	66	48	45
18/09/2019	17:00	17:15	51	70	49	45
18/09/2019	17:15	17:30	49	63	52	45
18/09/2019	17:30	17:45	47	56	49	45
18/09/2019	17:45	18:00	49	59	51	47
18/09/2019	18:00	18:15	50	58	51	48
18/09/2019	18:15	18:30	54	66	56	50
18/09/2019	18:30	18:45	56	61	57	54
18/09/2019	18:45	19:00	55	65	57	53
18/09/2019	19:00	19:15	55	62	58	52
18/09/2019	19:15	19:30	56	63	58	53
18/09/2019	19:30	19:45	55	64	58	51
18/09/2019	19:45	20:00	50	61	53	46
18/09/2019	20:00	20:15	48	56	51	45
18/09/2019	20:15	20:30	46	56	48	43
18/09/2019	20:30	20:45	47	59	48	44
18/09/2019	20:45	21:00	47	57	50	44
18/09/2019	21:00	21:15	48	56	50	44
18/09/2019	21:15	21:30	46	53	48	42
18/09/2019	21:30	21:45	48	57	50	43
18/09/2019	21:45	22:00	52	60	55	47
18/09/2019	22:00	22:15	54	63	57	49
18/09/2019	22:15	22:30	50	59	53	45
18/09/2019	22:30	22:45	46	55	49	41
18/09/2019	22:45	23:00	45	58	47	41
18/09/2019	23:00	23:15	46	57	49	42
18/09/2019	23:15	23:30	47	62	48	41
18/09/2019	23:30	23:45	49	65	52	42
18/09/2019	23:45	00:00	50	59	53	45
19/09/2019	00:00	00:15	50	60	53	42
19/09/2019	00:15	00:30	49	60	52	43
19/09/2019	00:30	00:45	48	59	52	39
19/09/2019	00:45	01:00	47	59	50	41
19/09/2019	01:00	01:15	48	59	51	40
19/09/2019	01:15	01:30	48	58	53	35
19/09/2019	01:30	01:45	51	62	55	39
19/09/2019	01:45	02:00	52	62	56	37
19/09/2019	02:00	02:15	52	60	56	38
19/09/2019	02:15	02:30	51	60	55	40

Date	Time		Noise Level dB			
	Start	End	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
19/09/2019	02:30	02:45	52	61	56	42
19/09/2019	02:45	03:00	50	59	54	43
19/09/2019	03:00	03:15	48	58	52	40
19/09/2019	03:15	03:30	50	57	53	42
19/09/2019	03:30	03:45	49	60	52	40
19/09/2019	03:45	04:00	51	60	54	41
19/09/2019	04:00	04:15	49	57	52	41
19/09/2019	04:15	04:30	53	63	56	45
19/09/2019	04:30	04:45	52	59	55	45
19/09/2019	04:45	05:00	52	60	55	45
19/09/2019	05:00	05:15	53	60	55	49
19/09/2019	05:15	05:30	54	61	57	51
19/09/2019	05:30	05:45	54	62	56	51
19/09/2019	05:45	06:00	54	60	56	52
19/09/2019	06:00	06:15	57	66	59	54
19/09/2019	06:15	06:30	59	69	61	56
19/09/2019	06:30	06:45	61	65	63	59
19/09/2019	06:45	07:00	62	71	63	60
19/09/2019	07:00	07:15	62	65	63	60
19/09/2019	07:15	07:30	62	69	63	60
19/09/2019	07:30	07:45	60	68	62	57
19/09/2019	07:45	08:00	56	67	58	53
19/09/2019	08:00	08:15	56	62	57	53
19/09/2019	08:15	08:30	55	72	57	53
19/09/2019	08:30	08:45	53	66	55	50
19/09/2019	08:45	09:00	51	68	52	49
19/09/2019	09:00	09:15	52	57	54	50
19/09/2019	09:15	09:30	53	73	55	50
19/09/2019	09:30	09:45	53	67	54	50
19/09/2019	09:45	10:00	52	70	53	49
19/09/2019	10:00	10:15	52	67	54	50
19/09/2019	10:15	10:30	52	73	53	50
19/09/2019	10:30	10:45	50	67	51	48
19/09/2019	10:45	11:00	50	57	51	47
19/09/2019	11:00	11:15	50	68	52	47
19/09/2019	11:15	11:30	51	57	53	50
19/09/2019	11:30	11:45	52	62	54	50
19/09/2019	11:45	12:00	50	65	51	48
19/09/2019	12:00	12:15	49	65	51	45
19/09/2019	12:15	12:30	48	61	49	45
19/09/2019	12:30	12:45	48	63	49	46
19/09/2019	12:45	13:00	47	57	48	45
19/09/2019	13:00	13:15	48	66	49	46
19/09/2019	13:15	13:30	49	71	50	46
19/09/2019	13:30	13:45	50	61	51	47
19/09/2019	13:45	14:00	50	62	51	48
19/09/2019	14:00	14:15	50	66	52	46
19/09/2019	14:15	14:30	50	60	53	47
19/09/2019	14:30	14:45	51	66	54	46

Date	Time		Noise Level dB			
	Start	End	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
19/09/2019	14:45	15:00	50	65	52	47
19/09/2019	15:00	15:15	49	64	51	46
19/09/2019	15:15	15:30	48	58	49	45
19/09/2019	15:30	15:45	49	56	51	48
19/09/2019	15:45	16:00	52	62	54	49
19/09/2019	16:00	16:15	51	63	53	48
19/09/2019	16:15	16:30	58	78	57	51
19/09/2019	16:30	16:45	56	70	57	53
19/09/2019	16:45	17:00	55	62	57	53
19/09/2019	17:00	17:15	52	63	54	49
19/09/2019	17:15	17:30	52	64	55	49
19/09/2019	17:30	17:45	54	68	56	51
19/09/2019	17:45	18:00	55	67	57	52
19/09/2019	18:00	18:15	58	66	60	56
19/09/2019	18:15	18:30	59	67	61	57
19/09/2019	18:30	18:45	60	71	61	58
19/09/2019	18:45	19:00	60	73	61	58
19/09/2019	19:00	19:15	60	64	62	58
19/09/2019	19:15	19:30	60	67	61	57
19/09/2019	19:30	19:45	59	68	61	57
19/09/2019	19:45	20:00	59	63	61	56
19/09/2019	20:00	20:15	59	65	61	56
19/09/2019	20:15	20:30	59	64	61	57
19/09/2019	20:30	20:45	57	63	59	55
19/09/2019	20:45	21:00	57	63	59	54
19/09/2019	21:00	21:15	57	64	60	53
19/09/2019	21:15	21:30	58	64	61	54
19/09/2019	21:30	21:45	57	64	60	54
19/09/2019	21:45	22:00	57	65	59	53
19/09/2019	22:00	22:15	57	63	59	53
19/09/2019	22:15	22:30	57	62	59	54
19/09/2019	22:30	22:45	58	64	60	53
19/09/2019	22:45	23:00	58	70	60	53
19/09/2019	23:00	23:15	60	68	62	56
19/09/2019	23:15	23:30	57	64	60	52
19/09/2019	23:30	23:45	55	62	57	51
19/09/2019	23:45	00:00	54	62	57	51
20/09/2019	00:00	00:15	54	60	56	51
20/09/2019	00:15	00:30	54	60	56	51
20/09/2019	00:30	00:45	54	60	56	49
20/09/2019	00:45	01:00	53	60	56	49
20/09/2019	01:00	01:15	53	61	55	48
20/09/2019	01:15	01:30	53	60	55	48
20/09/2019	01:30	01:45	54	63	56	49
20/09/2019	01:45	02:00	53	62	56	47
20/09/2019	02:00	02:15	53	61	56	48
20/09/2019	02:15	02:30	54	61	57	49
20/09/2019	02:30	02:45	53	62	57	47
20/09/2019	02:45	03:00	61	73	66	51

Date	Time		Noise Level dB			
	Start	End	L _{Aeq}	L _{Amax}	L _{A10}	L _{A90}
20/09/2019	03:00	03:15	55	61	58	50
20/09/2019	03:15	03:30	55	61	57	50
20/09/2019	03:30	03:45	53	59	55	50
20/09/2019	03:45	04:00	54	60	56	49
20/09/2019	04:00	04:15	53	61	56	47
20/09/2019	04:15	04:30	56	62	58	52
20/09/2019	04:30	04:45	54	60	56	50
20/09/2019	04:45	05:00	55	61	57	52
20/09/2019	05:00	05:15	57	62	59	53
20/09/2019	05:15	05:30	58	64	60	56
20/09/2019	05:30	05:45	59	64	61	56
20/09/2019	05:45	06:00	59	69	60	57
20/09/2019	06:00	06:15	59	65	60	57
20/09/2019	06:15	06:30	60	68	62	59
20/09/2019	06:30	06:45	62	78	63	60
20/09/2019	06:45	07:00	62	67	64	61
20/09/2019	07:00	07:15	62	71	64	61
20/09/2019	07:15	07:30	62	69	63	60
20/09/2019	07:30	07:45	63	66	64	61
20/09/2019	07:45	08:00	61	66	63	60
20/09/2019	08:00	08:15	60	66	61	57
20/09/2019	08:15	08:30	60	73	61	58
20/09/2019	08:30	08:45	58	63	60	57
20/09/2019	08:45	09:00	57	73	58	55
20/09/2019	09:00	09:15	54	59	55	52
20/09/2019	09:15	09:30	53	64	54	51
20/09/2019	09:30	09:45	55	70	57	53
20/09/2019	09:45	10:00	56	62	58	54
20/09/2019	10:00	10:15	59	68	61	56
20/09/2019	10:15	10:30	61	68	63	58
20/09/2019	10:30	10:45	60	69	62	58
20/09/2019	10:45	11:00	61	67	62	58
20/09/2019	11:00	11:15	61	67	63	59
20/09/2019	11:15	11:30	61	67	63	59
20/09/2019	11:30	11:45	61	67	63	59
20/09/2019	11:45	12:00	61	67	63	58
20/09/2019	12:00	12:15	61	66	63	59
20/09/2019	12:15	12:30	60	66	62	58
20/09/2019	12:30	12:45	60	66	62	58
20/09/2019	12:45	13:00	61	67	63	59
20/09/2019	13:00	13:15	61	68	63	58
20/09/2019	13:15	13:30	61	68	63	58
20/09/2019	13:30	13:45	61	68	63	58
20/09/2019	13:45	14:00	60	66	62	58
20/09/2019	14:00	14:15	61	69	63	58
20/09/2019	14:15	14:30	61	68	63	59
20/09/2019	14:30	14:45	62	68	64	60
20/09/2019	14:45	15:00	61	69	63	59