hepworth acoustics

PROPOSED RESIDENTIAL DEVELOPMENT AT SOUTH SIDE, STEEPLE ASTON

NOISE ASSESSMENT

On behalf of:

Rectory Homes Ltd

hepworth acoustics

Report No: P19-460-R01v3
November 2019

PROPOSED RESIDENTIAL DEVELOPMENT AT SOUTH SIDE, STEEPLE ASTON

NOISE ASSESSMENT

Report prepared by:
Hepworth Acoustics Ltd
1st Floor Aztec Centre
Aztec West
Almondsbury
Bristol BS32 4TD

On behalf of:
Rectory Homes Ltd

Report prepared by: Graham Bowland BSc MIOA – Technical Director	[redacted]
Report checked by: Donald Quinn BSc FIOA – Managing Director	[redacted]

CONTENTS

1.0 INTRODUCTION

1.1 Hepworth Acoustics was commissioned to carry out a noise assessment relating to a proposed residential development at South Side, Steeple Aston, Oxfordshire.

1.2 The site is currently an open field and is surrounded by further open fields and existing residences to most parts. However, the northern half of the west site boudary is shared with the premises of Steve Ward Autos, which is a car workshop business.

1.3 The proposed development comprises ten detached and semi-detached homes, each accessed from a common access drive, setting frontages back from South Side, and each with a private rear garden to the south of the site.

1.4 A plan of the development in context is provided in Figure 1.

1.5 The Steve Ward Autos site comprises a single workshop building to the southeast corner of that site. The remainder is hardstanding, used for parking and storage of vehicles etc. The building is of solid blockwork construction with some areas of glazing, and a solid tiled/sheet roof. The frontage is a roller shutter, which is left open during operational periods. The only noted item of external plant is a compressor and compressed air tank adjacent to the southeast corner of the workshop building.

1.6 This assessment is focused upon the potential impact of any noise associated with the operation of Steve Ward Autos on the proposed development, and hence considers noise towards the western boundary of the proposed development site only. It is noted that the proposed Plot 10 is located close to this boundary. It is understood that no habitable room windows are proposed to the gable wall of this plot facing towards the workshop.

1.7 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 Paragraph 182 states that "*Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed*."

2.4 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

2.5 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.

2.6 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.

2.7 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.

2.8 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.

2.9 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.

2.10 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.

2.11 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 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.

2.12 The scope of the ProPG is restricted to sites that are exposed predominantly to noise from transportation sources. However, the recommended approach is also stated as being suitable where some industrial or commercial noise contributes to the acoustic environment provided that it is "*not dominant*".

BS 8233

2.13 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 $L_{Aeq,16hr}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

2.14 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*".

2.15 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.

2.16 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)*".

2.17 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*".

2.18 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.*"

BS 4142

2.19 British Standard 4142: 2014 *'Methods for rating and assessing industrial and commercial sound'* provides methods for rating and assessing sound of an industrial and/or commercial nature and requires the 'rating' sound level for the operation to be compared with the L_{A90} background sound level in the absence of the operational noise.

2.20 The 'rating' level is derived based on the 'specific' L_{Aeq} sound level attributable to the operation with an 'acoustic feature' penalty added for any sound sources which give rise to tonal, impulsive, intermittent, or other characteristics readily distinctive against the residual acoustic environment.

2.21 BS 4142 stipulates that impacts should be assessed over a reference time interval of 1-hour during the daytime (0700-2300hrs).

2.22 An initial estimate of the impact of the operation is determined by subtracting the background level from the 'rating' level. BS 4142 states that:

- Typically, the greater this difference, the greater the magnitude of the impact
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context
- The lower the 'rating' level is relative to the measured background level, the less likely it is that the operation will have an adverse impact or a significant adverse impact. Where the 'rating' level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

2.23 Where the initial estimate of the impact needs to be modified due to the context, BS 4142 states that all pertinent factors should be taken into account in determining whether the initial estimate of the impact needs to be modified, including:

- The absolute level of sound, including "*where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds background*"
- The character and level of the residual sound
- The sensitivity of the receptor and whether dwellings … will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as: i) façade insulation treatment, ii) ventilation and/or cooling, and iii) acoustic screening.

3.0 NOISE SURVEY AND ASSESSMENT

3.1 A noise survey was carried out at the site over the periods 1500-1825hrs on Thursday 3 October 2019 and 0700-1010hrs on Friday 4 October 2019.

3.2 Noise measurements were undertaken at three locations, all of which are close to the boundary of the site with the adjacent Steve Ward Autos site, identified in Figure 1 and described as follows:

- Location 1 is set forwards as a reference location, more exposed to any noise break-out from the open roller-shutter of the adjacent workshop than the actual proposed frontages.
- Location 2 is at the worst-case location with respect to the compressor at the adjacent site, at the gable wall position of the closest proposed plot.
- Location 3 is representative of the western edge of the garden of the nearest proposed plot.

3.3 Noise measurements were undertaken in sequential 5-minute sample periods at all locations. A single sound level meter (Norsonic 140 Type 1 Integrating Sound Level Meter (s/n. 1406529) was positioned at Location 1 for all survey periods. A second sound level meter (Bruel & Kjaer 2260 Type 1 Integrating Sound Level Meter s/n. 2467014) was moved between Locations 2 and 3 to obtain periods of measurements at each location.

3.4 Calibration checks were carried out on both Sound Level Meters before and after all survey periods using a Bruel & Kjaer Acoustic Calibrator, Type 4231 (serial no. 2389221), and no variation in the calibration levels occurred.

3.5 The measurement microphones were fitted with windshields and mounted in 'free-field' conditions.

3.6 The weather during the noise surveys was generally dry and clear, albeit with a brief period of light drizzle late on the afternoon of Thursday 3 October 2019, with a light south-westerly breeze for all periods.

3.7 Steve Ward Autos was noted to be operational during the afternoon of Thursday 3 October 2019 until about 1720hrs, and on the morning of Friday 4 October 2019 from about 0805hrs. Hence the operation is daytime only.

3.8 It was noted that for the majority of the time there was no noticeable noise from Steve Ward Autos. General noise from inside the workshop was very occasionally noticeable, typically from use of power/compressed air and hand tools, however this noise was scarce and sporadic. There was also occasional external noise from vehicle manoeuvring, a phone bell and dropping of materials into bins (especially at the start and end of the day), however again this noise was infrequent.

3.9 By contrast, steady background road traffic noise from A4260 / B4030 to the southwest was audible at all times. Local road traffic activity on South Side is relatively light and hence associated noise levels are comparatively low, but include contribution from heavy vehicles and is nonetheless sufficient to be a noticeable source of ambient noise. Low flying light aircraft, fixed and rotary wing, were also noted frequently.

3.10 Notwithstanding the foregoing, the compressor to the southeast of the Steve Ward Autos workshop building was noted to be a significant noise source, when operating. This is in the form of a motor type noise. Typically, this runs for ~80 seconds, roughly once every half hour during the working hours of Steve Ward Autos. At the start of the day, however, from about 0810hrs the compressor ran for a longer period of about 6-7 minutes. It is assumed that a longer period is required at the start of the day to 'fully-charge' the compressed air tank and that throughout the rest of the day shorter periods are occasionally required to 'top-up' the tank. As per the above description, the actual 'on-time' of the compressor noise is relatively short, however noise levels in proximity to the unit during operation are significant.

3.11 The measured noise levels are summarised in Table 2, presenting logarithmically averaged noise levels for both the morning and afternoon survey periods at each location. This is done separately for periods outside of Steve Ward Autos operation, for 5-minute samples periods during operation but when no noise attributable to the operation was noted, and then for periods during operation that included attributable noise, both including and excluding sample periods when compressor operation was noted.

Table 2 : Overall Daytime and Night-time Road Traffic Noise Levels at Location 1

Workshop Open	General Workshop Related Noise	Compressor Noise Included	dB L_{Aeq} Noise Level					
			Location 1		Location 2		Location 3	
			A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
No	-	-	51	49	52	-	-	-
Yes	No	No	50	49	51	49	50	49
Yes	Yes	No	50	50	51	50	47	50
Yes	Yes	Yes	59	56	69	64	56	56

3.12 Based on the data above, it can be seen that there is fairly close correlation between the morning (A.M.) and afternoon (P.M.) periods. One notable exception is that the summarised noise level including compressor noise is higher in the morning than the afternoon at Locations 1 and 2. This is due to the slightly more prolonged operation at 0810hrs. There were no measurements at Location 3 at that particular time of the morning, hence this discrepancy is not shown at that location.

3.13 Notwithstanding the usefulness of presenting morning and afternoon data separately, an assessment in terms of BS 4142 has been based on overall averaging over the survey periods. The samples during which the workshop was closed and when open, but with no workshop-related noise present have also been combined to determine single values for 'residual' noise. Representative background noise levels have been based on the arithmetic average of measured values of LA90 at each location during periods where workshop noise was not present.

3.14 The BS 4142 assessment to are presented in Table 3.

Table 3 : BS 4142 Assessments

dB Noise Level	Location 1		Location 2		Location 3	
	Compressor OFF	ON	Compressor OFF	ON	Compressor OFF	ON
Noise Level During Operation, dB $L_{Aeq,T}$	50	58	50	67	47	56
Residual Noise Leve,l dB $L_{Aeq,T}$	50	50	51	51	50	50
Specific Noise Level, dB $L_{Aeq,T}$	40	57	40	67	37	55
Correction for Tonality, dB	0	2	0	2	0	2
Correction for Intermittency, dB	3	3	3	3	3	3
Rating Level, dB L_{Ar}	43	62	43	72	40	60
Background Noise Level dB $L_{A90,T}$	45	45	43	43	45	45
Rating Level minus Background Level	-2	17	0	29	-5	14

3.15 The results set out in Table 3 demonstrate clearly that the rating noise level with respect to Steve Ward Autos, excluding the compressor is not in excess of the representative background noise level at all locations, based on an assessment excluding the compressor noise. Based on BS 4142, this corresponds to an indication of low noise impact, depending on the context.

3.16 Conversely, the rating noise level based on an assessment including the compressor noise shows the rating noise level to be at least 14dB in excess of the representative background noise level at all locations. Based on BS 4142, this corresponds to an indication of a significant adverse impact, depending on the context.

3.17 This is entirely consistent with subject impressions formed during the noise survey, that being that most of the very occasional noise noticeable from Steve Ward Autos was of a very much non-intrusive nature, at low level in comparison to ambient and background noise most noticeable towards Location 1, level with the open roller shutter to the workshop, beyond the line of the proposed plots. However, noise from the compressor, located externally at the boundary of the two sites, was subjectively noted to be intrusive.

3.18 The above is based on a scenario without any mitigation incorporated. Suitable mitigation measures to adequately control the noise are discussed in the following section.

4.0 NOISE MITIGATION MEASURES

4.1 Based on the foregoing, some noise mitigation is considered necessary to protect future residents at the proposed development (notably Plot 10 based on the layout in Figure 1) from noise associated with Steve Ward Autos. At the same time, this mitigation is necessary to ensure that no unreasonable restrictions are placed upon that business as a result of the development.

4.2 The mitigation is, however, needed only with respect to the compressor located externally to the southeast of the Steve Ward Autos workshop building. No mitigation is considered necessary with respect to any other noise.

4.3 It is noted that the location of the compressor is fairly central to the gable wall of Plot 10, facing towards the workshop, and that there are no habitable room windows on this elevation. This is helpful, as based on a traditional masonry construction, there will be a high level of sound insulation directly via the wall into internal areas, and the noise level of the diffracted sound to the front and rear elevations will be substantially diminished. Also, although areas to the west edge of the garden of Plot 10 will remain exposed to the noise without additional mitigation, many areas where the building precludes line-of-sight to the source location will be protected to a degree by way of acoustic screening.

4.4 However, while this arrangement and these factors are clearly helpful, it is not considered that this provides quite sufficient control of noise without further mitigation.

4.5 It is therefore recommended that acoustic screening is provided to the boundary of the two sites, as close to the Plot 10 building as possible, extending adjacent to the gable wall and to at least 2m beyond the line of the front wall of Plot 10, and at least 8m beyond the line of the rear wall of Plot 10.

4.6 The acoustic screening should be of overall mass not less than 10kg/m^2 and nominal thickness not less than 20mm (e.g. proprietary acoustic fencing or solid masonry wall). However, it is also recommended that an area of the acoustic screen at least 4m centred directly opposite the compressor, and extending to full height, is provided with an acoustically absorbent surface facing towards the compressor. This is to control reverberant build-up of noise due to the presence of the screen. Suitable proprietary solutions are available and recommended (e.g Jakoustic PLUS Absorptive Acoustic Fencing).

4.7 The construction of the screen should be imperforate with no holes or gaps and should be sealed at the base.

4.8 Given that the compressor operation is during normal daytime working hours only, based on the conventionally laid-out dwellings proposed, it is considered suitable to focus on the protection of ground level internal and external areas. On this basis, it is recommended that adequate protection will be provided by an acoustic screen that is 2.7m in height.

4.9 With the recommended mitigation in place, it is anticipated that rating noise levels due to Steve Ward Autos operation, including compressor noise, will not be significantly in excess of prevailing background noise levels

5.0 SUMMARY AND CONCLUSION

5.1 Hepworth Acoustics has undertaken a noise assessment relating to a proposed residential development at South Side, Steeple Aston, Oxfordshire.

5.2 A noise survey has been undertaken to determine the prevailing noise climate at the site and a summary of the results has been provided, with reference to relevant British Standard guidelines.

5.3 Outline recommendations of appropriate noise mitigation measures have been made in order to achieve appropriate acoustic criteria in line with relevant British Standard guidelines.

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_{pA} This is the A-weighted sound pressure level.

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, LAeq 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	Start Time	Noise Level dB								
		Location 1			Location 2			Location 3		
		L_{Aeq}	L_{Amax}	L_{A90}	L_{Aeq}	L_{Amax}	L_{A90}	L_{Aeq}	L_{Amax}	L_{A90}
03/10/2019	15:00	48	58	43				48	55	44
03/10/2019	15:05	46	56	42				46	53	42
03/10/2019	15:10	50	65	45				49	58	45
03/10/2019	15:15	64	80	45				63	82	45
03/10/2019	15:20	50	58	46				48	55	45
03/10/2019	15:25	48	57	44				48	55	44
03/10/2019	15:30	48	59	44				48	57	45
03/10/2019	15:35	48	59	43				47	56	43
03/10/2019	15:40	46	55	42				47	54	43
03/10/2019	15:45	50	67	42				51	69	45
03/10/2019	15:50	64	80	43				64	82	45
03/10/2019	15:55	48	57	43				50	59	45
03/10/2019	16:00	48	57	44				50	59	46
03/10/2019	16:05	55	74	45				55	75	46
03/10/2019	16:10	51	62	48				52	58	49
03/10/2019	16:15	50	58	46				51	62	47
03/10/2019	16:20	50	63	45	51	68	46			
03/10/2019	16:25	63	79	44	71	90	45			
03/10/2019	16:30	52	77	45	50	70	46			
03/10/2019	16:35	50	74	45	49	69	45			
03/10/2019	16:40	47	56	43	48	56	44			
03/10/2019	16:45	64	80	44	71	90	46			
03/10/2019	16:50	50	67	45	50	65	45			
03/10/2019	16:55	47	58	43	49	50	48			
03/10/2019	17:00	54	81	46	51	75	47			
03/10/2019	17:05	49	58	46	49	56	46			
03/10/2019	17:10	52	75	46	51	69	45			
03/10/2019	17:15	50	62	45	50	65	45			
03/10/2019	17:20	51	61	45						
03/10/2019	17:25	49	59	45						
03/10/2019	17:30	47	59	44						
03/10/2019	17:35	49	63	44						
03/10/2019	17:40	47	58	43						
03/10/2019	17:45	47	57	44						
03/10/2019	17:50	48	59	44						
03/10/2019	17:55	50	62	44						
03/10/2019	18:00	47	58	44						
03/10/2019	18:05	48	58	44						
03/10/2019	18:10	51	68	44						
03/10/2019	18:15	48	57	44						
03/10/2019	18:20	50	66	44						
04/10/2019	07:00	49	60	45						
04/10/2019	07:05	50	61	45						
04/10/2019	07:10	50	59	47						
04/10/2019	07:15	49	60	46						
04/10/2019	07:20	51	74	46						
04/10/2019	07:25	51	68	45						
04/10/2019	07:30	50	63	47						

Date	Start Time	Noise Level dB								
		Location 1			Location 2			Location 3		
		L_{Aeq}	L_{Amax}	L_{A90}	L_{Aeq}	L_{Amax}	L_{A90}	L_{Aeq}	L_{Amax}	L_{A90}
04/10/2019	07:35	50	63	46						
04/10/2019	07:40	52	66	47						
04/10/2019	07:45	53	67	46	55	69	48			
04/10/2019	07:50	51	65	46	51	63	47			
04/10/2019	07:55	50	60	46	50	59	46			
04/10/2019	08:00	51	65	46	51	61	47			
04/10/2019	08:05	51	64	46	51	60	48			
04/10/2019	08:10	69	72	68	76	78	76			
04/10/2019	08:15	64	89	46	72	89	46			
04/10/2019	08:20	51	70	45	50	63	45			
04/10/2019	08:25	54	69	47	52	64	48			
04/10/2019	08:30	64	80	47	72	90	47			
04/10/2019	08:35	52	76	46	53	74	47			
04/10/2019	08:40	50	61	46	50	59	46			
04/10/2019	08:45	51	66	45	51	61	46			
04/10/2019	08:50	50	69	44	50	60	45			
04/10/2019	08:55	50	60	46	51	58	47			
04/10/2019	09:00	64	80	44	72	90	45			
04/10/2019	09:05	49	60	45				51	59	47
04/10/2019	09:10	48	60	45				51	62	47
04/10/2019	09:15	48	58	44				51	56	47
04/10/2019	09:20	46	58	42				49	57	45
04/10/2019	09:25	48	58	43				50	57	45
04/10/2019	09:30	64	80	42				64	81	44
04/10/2019	09:35	49	66	42				50	62	45
04/10/2019	09:40	48	63	42				50	62	44
04/10/2019	09:45	49	66	44				52	69	47
04/10/2019	09:50	46	56	43				50	59	45
04/10/2019	09:55	47	60	43				49	58	44
04/10/2019	10:00	62	76	44				61	74	48
04/10/2019	10:05	59	79	42				59	81	44