

**PROPOSED RESIDENTIAL DEVELOPMENT AT
LAND SOUTH OF LEVEL MARE LANE, EASTERGATE**

NOISE ASSESSMENT

**On behalf of:
Reside Developments Ltd**

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Report prepared by:
Hepworth Acoustics Ltd

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

On behalf of:
Reside Developments Ltd

Report prepared by:
[REDACTED] BSc MSc MIOA - Consultant

[REDACTED]

Report checked by:
[REDACTED] BSc FIOA - Managing Director

[REDACTED]

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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 Land to the South of Level Mare Lane, Eastergate.
- 1.2 The location of the site within the context of the surrounding area is shown in Figure 1.
- 1.3 The site, which is currently in use as paddocks, is bound by Level Mare Lane to the North beyond which is the southern end of the Fontwell Park Horse Racing Track, existing residential properties and more paddocks to the West and South; and an approved residential development directly to the East.
- 1.4 The proposed layout of the development is shown in Figure 2.
- 1.5 This noise assessment has included:
- Adoption of appropriate acoustic design criteria;
 - An inspection of the site and surrounding area;
 - A noise survey covering a full day/night period on a weekday, including automated and attended noise monitoring; and
 - An assessment of the potential noise impact on the proposed development.
- 1.6 The various noise 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 DESIGN GUIDANCE

NPPF

- 2.1 The National Planning Policy Framework (NPPF) 2021 states in paragraph 174 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 Paragraph 187 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.”*
- 2.3 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 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 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.
- 2.6 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.

- 2.7 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.
- 2.8 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.
- 2.9 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.
- 2.10 The scope of 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

- 2.11 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 (07:00-23:00) and night-time (23:00-07:00) periods are summarised in Table 1.

Table 1 : BS 8233 Recommended Acoustic Design Criteria

Activity	Location	Internal Noise Levels	
		Daytime (07:00-23:00)	Night-time (23:00-07:00)
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

- 2.12 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*”.

- 2.13 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.
- 2.14 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)”*.
- 2.15 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”*.
- 2.16 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 & ASSESSMENT

Noise Survey

- 3.1 The proposed development site was visited on Thursday 8 July 2021 to install automated noise monitoring equipment and carry out supplementary attended noise measurements, in order to measure noise levels on the development land.
- 3.2 The noise monitoring was carried out at the locations shown in Figure 3, as described below:
- Location A: Towards the north-east corner of the site;
 - Location B: Towards the southern side of the site;
 - Location C: Towards the north-west corner of the site;
 - Location D: Towards the eastern side of the site;
 - Location E: Towards the western side of the site;
- 3.3 Automated noise monitoring was carried out at locations A and B between 10:25 on Thursday 8 July 2021 and 11:15 on Friday 9 July 2021, covering a fulling day and night period.
- 3.4 Supplementary attended noise survey measurements were taken at location C, D and E, during the late morning and early afternoon on Thursday 8 July 2021.
- 3.5 Locations A and C are positioned at the northern-most elevations of the new proposed dwellings where the site is most exposed to road traffic noise from Level Mare Lane.
- 3.6 Location B is positioned at the south most elevation of the new proposed dwellings and was selected to determine whether there was any noticeable/significant noise from SRC Recycling, an existing business which is located approximately 350m to the south at its closest point, although there are existing intervening dwellings.
- 3.7 Locations D and E are positioned at the east most and west most elevations of the proposed dew dwellings respectively, and were selected to provide a more complete picture of the noise levels across the proposed development.
- 3.8 The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.4m above the ground. Calibration checks were carried out both before and after the noise survey with no variation in calibration level.

- 3.9 Weather conditions during the noise survey were suitable for sound level measurements, being dry with low winds, full details of the weather conditions and the noise survey equipment can be seen in Appendix II.
- 3.10 At the time of the noise survey the majority of the COVID-19 pandemic restrictions affecting public behaviour and movements were no longer in place and the road traffic in the area is considered to be representative of normal conditions. Therefore, there is not considered to have been any COVID-19 related effect on the noise survey results.
- 3.11 Full results of the noise survey are provided in Appendix II and a summary showing the range of the measured noise levels is shown in Table 2 below.

Table 2: Summary of Noise Survey Results (dB)

Location	Daytime (07:00-23:00)		Nigh-time (23:00-07:00)		
	$L_{A90,T}$	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Aeq,T}$	L_{Amax}
A: North-east	35-47	39-56	23-47	26-55	33-68
B: South	32-46	36-53	24-46	26-53	31-66
C: North-west	42-42*	45-46*	-	-	-
D: West	43-43*	46-47*	-	-	-
E: East	40-40*	42-43*	-	-	-

* Supplementary daytime noise survey measurements, not measured over a full daytime period.

- 3.12 The results in Table 1 above demonstrate that that noise levels incident upon the development land are fairly low. The proposed development land was generally quiet, with the prevailing noise source being from distant road traffic noise and the occasional passing vehicle on Level Mare Lane.
- 3.13 As can be seen from the results at Location A in Appendix II, there is a significant peak in the measured noise levels at 18:05. This peak noise event was recorded as 118 dB L_{Amax} , which is completely uncharacteristic of the noise climate in the area. The corresponding data at 18:05 measured at Location B does not show any correlated peak noise event. Therefore, it can be concluded with confidence that this is an extraneous peak of noise originating extremely local to the measurement microphone at Location A, most likely a bird temporarily perched on the noise monitoring equipment itself. On this basis, the anomalous noise event has been excluded from our analysis, including the summary in Table 1 above.
- 3.14 During the noise survey, there was some occasional very low level distant banging which was just noticeable from the South of the development land, although it was not clear what the source was. As the noise only lasted for a short period and did not noticeably change the prevailing noise levels on

the site, it is not considered significant or intrusive and is considered likely to have originated from work being carried out at one of the nearby existing dwellings.

- 3.15 Whilst it was not possible to measure noise levels on the development land during a horse race at the race track to the north, the potential noise impact from the horse race track is not considered likely to be significant as the spectator areas are much further to the north and only some occasional noise from passing horses on the southern most bend of the racetrack is likely to be noticeable, and the races are not held frequently.

Noise Assessment

- 3.16 For the purposes of comparison against the BS 8233 acoustic design criteria Table 3 below shows the 16-hour daytime noise level, 8-hour night-time noise level and 10th highest night-time peak noise event measured at locations A and B.

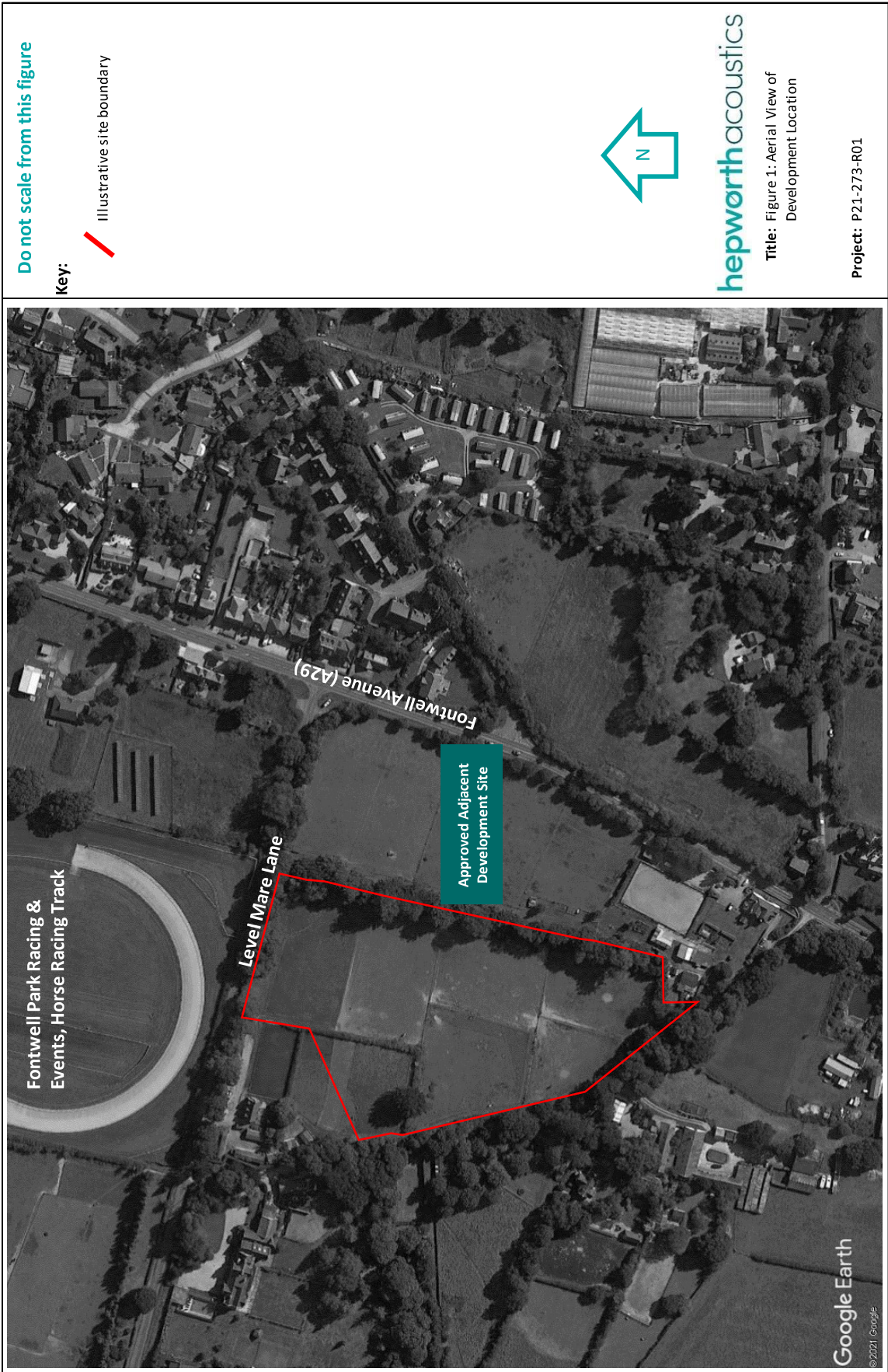
Table 3: Daytime and Night-time Noise Exposure Levels (dB)

Location	Daytime $L_{Aeq,16h}$	Night-time $L_{Aeq,8h}$	Night-time 10 th Highest L_{Amax}
A: North-east	47	43	60
B: South	46	42	58

- 3.17 As can be seen from the results in Table 3 above, the noise levels incident upon the development land are low/modest.
- 3.18 The daytime noise levels are within the BS 8233 criteria for noise levels within gardens and no special noise mitigation measures or acoustic fencing are warranted.
- 3.19 A partially open window typically provides a noise reduction of around 15 dB, therefore based on the criteria for internal noise levels set out in Section 2, where noise levels are within 50 dB $L_{Aeq,16h}$ during the daytime, within 45 dB $L_{Aeq,8h}$ and exceed 60 dB L_{Amax} no more than 10 times during the night-time, then the criteria can be achieved with windows open for natural ventilation.
- 3.20 Therefore, the proposed residential development does not need any special noise mitigation measures and standard double glazing and natural ventilation will be suitable for acoustic purposes.

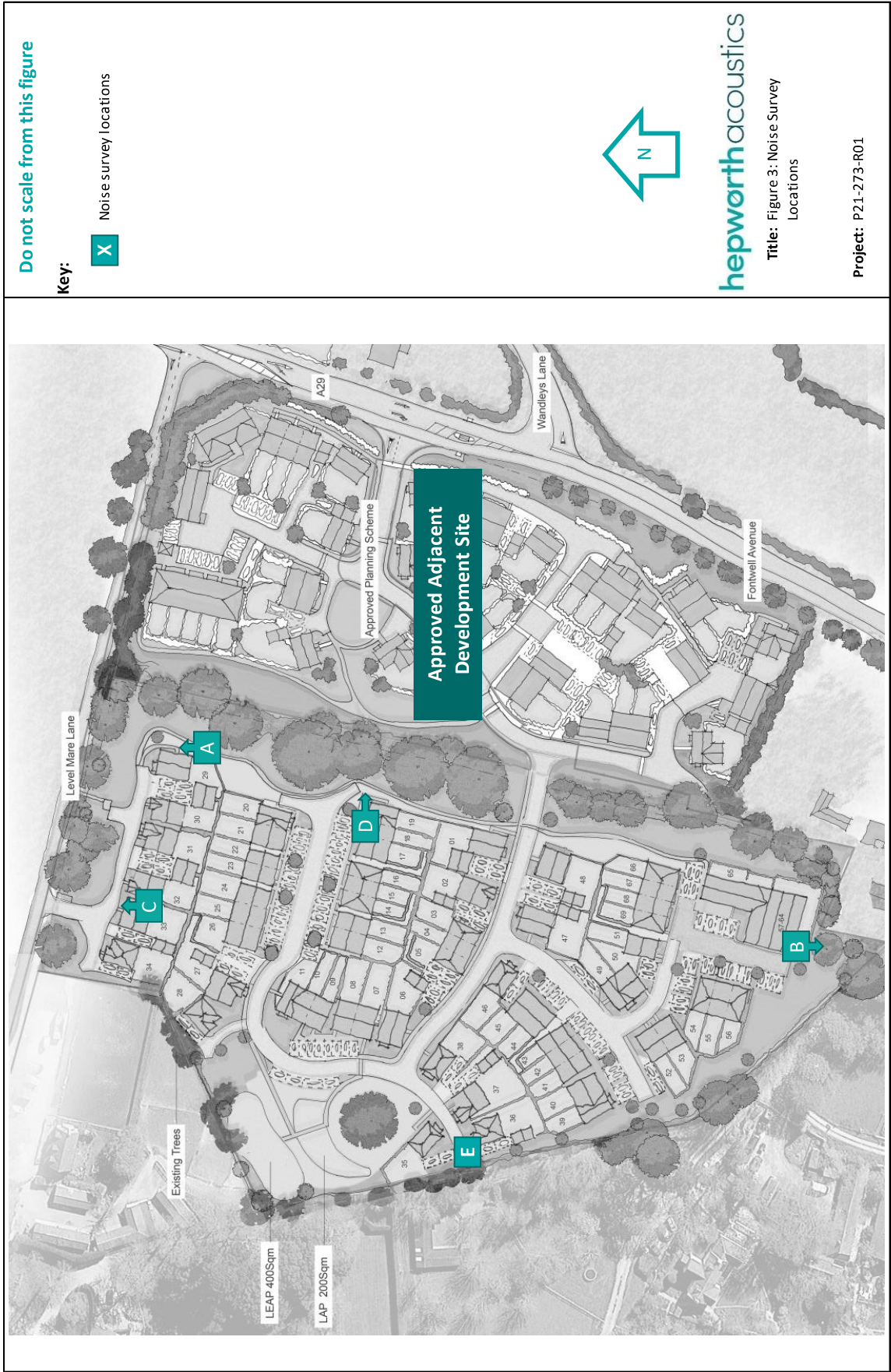
4.0 SUMMARY & CONCLUSIONS

- 4.1 Hepworth Acoustics Ltd was commissioned to carry out a noise assessment relating to a proposed residential development at Land to the South of Level Mare Lane, Eastergate.
- 4.2 Suitable acoustic design criteria have been adopted for the proposed new dwellings based on BS 8233 design criteria.
- 4.3 A noise survey has been carried out using a mixture of automated and attended noise monitoring to establish the noise levels incident upon the proposed development land.
- 4.4 The results of the noise survey have been assessed against BS 8233 design criteria and the findings show that no special noise mitigation measures are warranted for the proposed development.



Email: [REDACTED]
Tel: [REDACTED]





Email: [REDACTED]
Tel: [REDACTED]

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 pressure values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that the human response to sound most closely follows a logarithmic relationship. 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 (at the threshold of hearing) to 120 dB (at the threshold of pain).

Due to the logarithmic nature of decibels, when two sounds of the same level are combined together, the total sound level is (under normal circumstances) 3 dB higher than each of the individual sound levels e.g. 60 dB plus 60 dB = 63 dB. In terms of perceived 'loudness', a 3 dB(A) variation in sound level is a relatively small (but nevertheless just noticeable) change. An increase in sound level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in sound 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' the frequency spectrum appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using a mathematical filter called the 'A' weighting, which is built into sound level meters. Sound 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 Relevant Sound & Vibration 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 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 various indices used in this report, along with other relevant terms are described below.

$L_{Aeq,T}$ This is the A-weighted 'Equivalent Continuous Sound Level' which is an average of the total sound pressure measured over a specified time period. In other words, $L_{Aeq,T}$ is the level of a steady sound which has the same total (A-weighted) sound pressure as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for most forms of environmental noise.

L_{Amax} This is the 'Maximum A-weighted Sound Level' that was measured during the monitoring period. L_{Amax} used in this report refers throughout to L_{Amax} measured using the fast time weighting of the sound level meter, $L_{Amax,f}$.

$L_{A10,T}$ This is the A-weighted noise level exceeded for 10% of the time period. $L_{A10,T}$ is usually used as a measure of traffic noise.

$L_{A90,T}$ This is the A-weighted sound level exceeded for 90% of a measurement time period. $L_{A90,T}$ is used as a measure of background sound level.

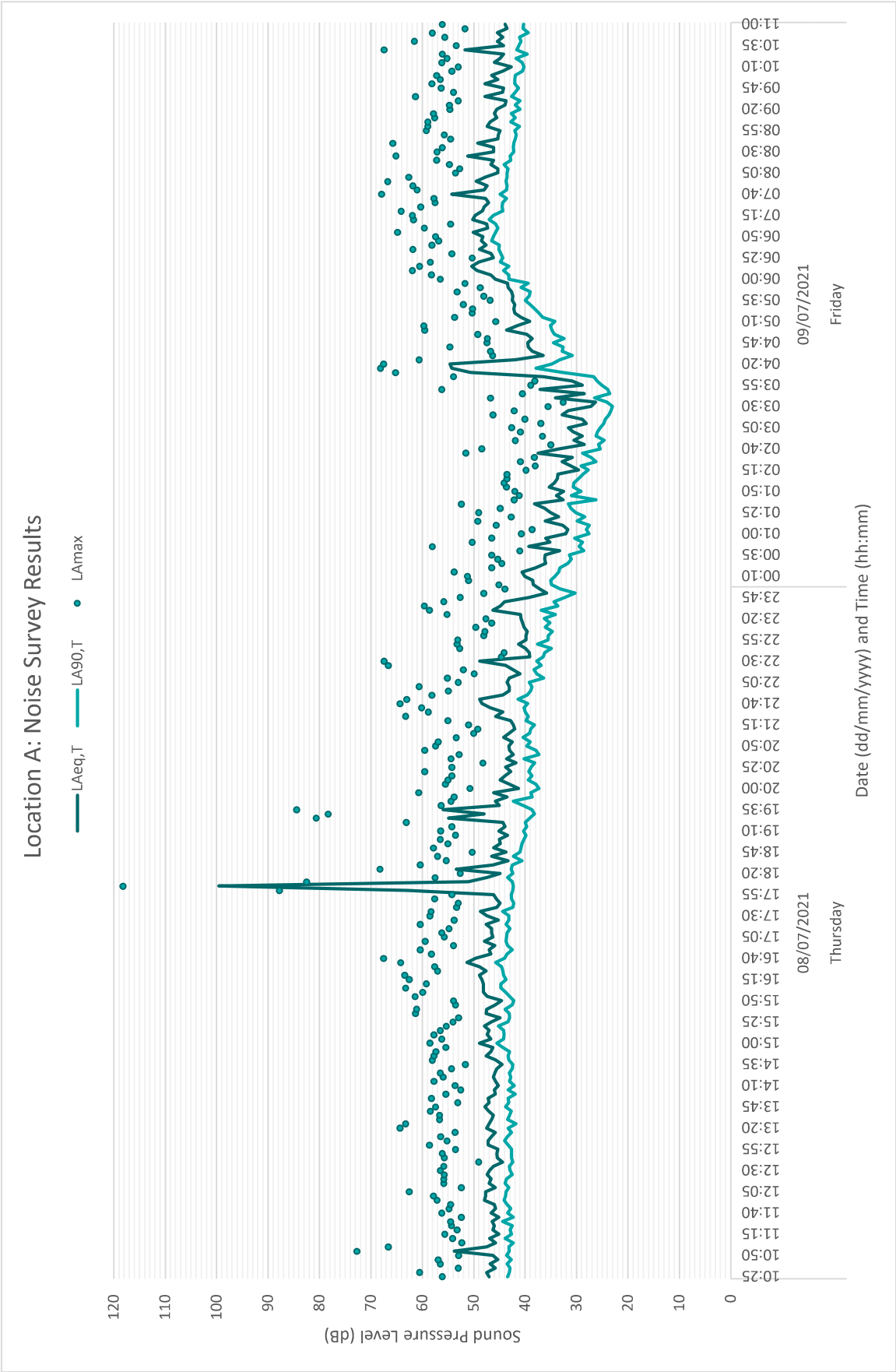
Appendix II: Noise Survey Results

Date(s)	Thursday 8 and Friday 9 July 2021
Equipment	Rion NA-28 'Class 1' sound analyser (S/N: 00960036) Norsonic Nor140 'Class 1' sound analyser (S/N: 1406529) Norsonic Nor118 'Class 1' sound analyser (S/N: 31617) Rion NC-74 'Class 1' sound calibrator (S/N: 00430648) Kestrel 2500 portable weather meter (S/N: 2556870) Associated environmental outdoor monitoring kits and tripods
Weather	Thursday Daytime: Dry, ~19°C with low winds <4 m.s ⁻¹ and low cloud coverage Thursday Night: Dry, ~14°C with low winds <2 m.s ⁻¹ and moderate cloud coverage Friday Morning: Dry, ~17°C with low winds <3 m.s ⁻¹ and low cloud coverage

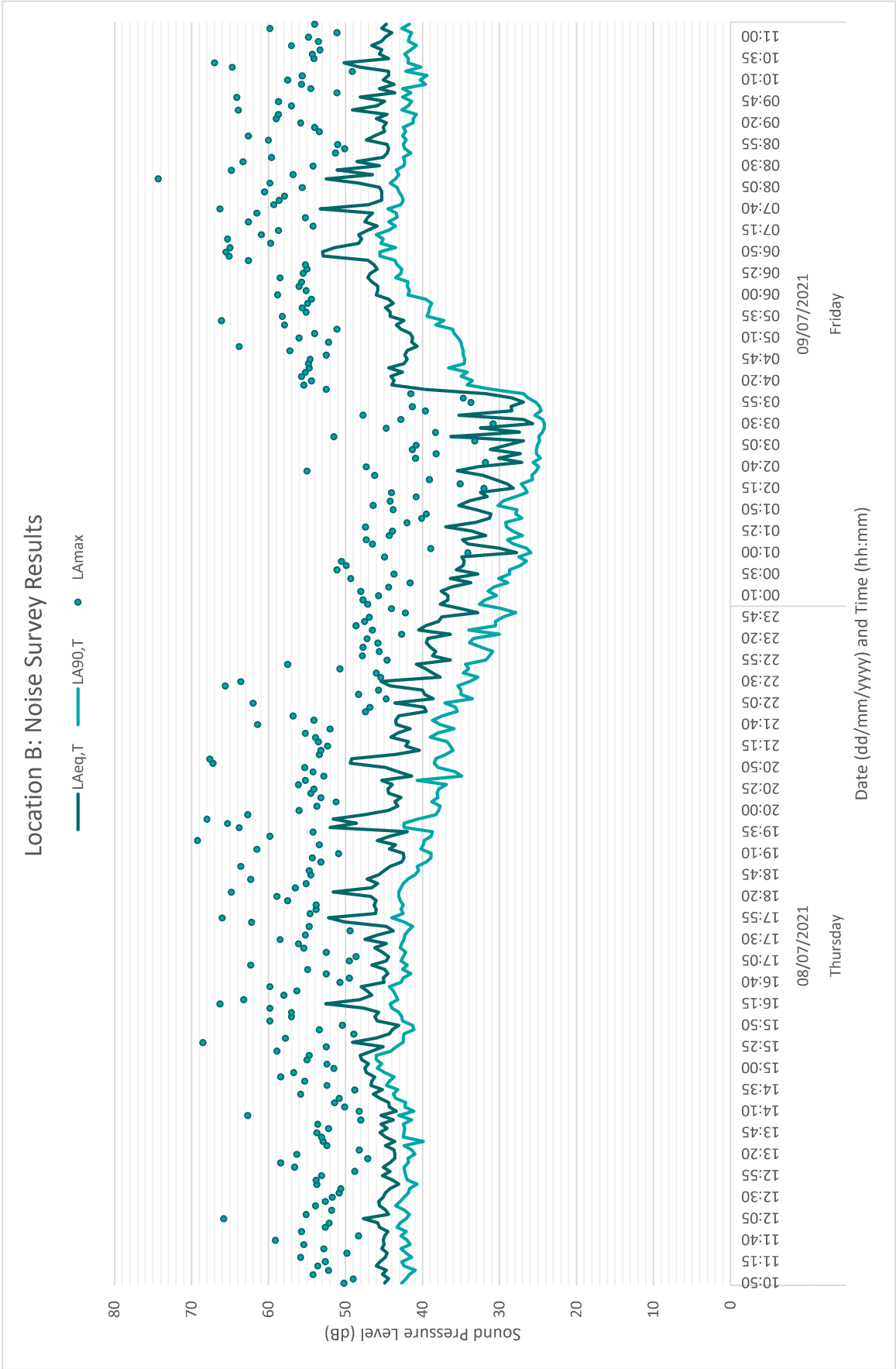
Please see the results of the noise survey in the table below and graphs overleaf.

Results of Attended Supplementary Noise Measurements

Time		Measured Noise Levels (dB)				Comments
Start	End	L_{Amax}	$L_{A10,T}$	$L_{Aeq,T}$	$L_{A90,T}$	
Location C						
11:10	11:25	57.0	48.5	46.0	42.1	Distant road traffic noise. Some bird noise. Some distant aircraft noise. Some very distant banging from the south.
11:25	11:40	60.5	47.0	45.4	41.9	Distant road traffic noise. Some bird noise. Some distant aircraft noise. Some very distant banging from the south.
Location D						
11:45	12:00	56.5	47.9	46.1	43.4	Distant road traffic noise. Some bird noise. Some distant aircraft noise. Some very distant banging from the south.
12:00	12:17	60.1	49.0	46.6	43.4	Distant road traffic noise. Some bird noise. Some distant aircraft noise. Some very distant banging from the south. Some distant dog barking and brief distant alarm.
Location E						
12:20	12:30	50.5	45.1	42.9	40.2	Distant road traffic noise. Some bird noise. Some distant aircraft noise.
12:30	12:45	56.6	43.6	41.9	39.5	Distant road traffic noise. Some bird noise. Some distant aircraft noise.



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Tel: [REDACTED]



Email: [REDACTED]
Tel: [REDACTED]