

HALSNEAD FARM, APPENDIX H1

NOISE IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT
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On behalf of:

Starship Group and Onward Homes

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1.0 INTRODUCTION

- 1.1 Hepworth Acoustics Ltd was commissioned by Starship Group and Onward Homes to carry out a noise survey and assessment in connection with a proposed planning application for a residential development on land at Halstead Farm in Knowsley. Specifically, the assessment was primarily required to evaluate traffic noise levels from the nearby M62 motorway, which borders the site to the north. The site location is shown in Figure 1.
- 1.2 The site comprises an area of farmland that gently rises from east to west alongside the motorway, cresting in the centre before gradually falling towards the west. To the south, the site is bordered by a narrow single-carriage trackway leading to two dwellings. Across this track is a large Yodel warehouse constructed as part of the Tritax Halsnead development.
- 1.3 During our site inspection, we noted that the warehouse has no vehicle access or loading bays on the elevation facing the site. All loading and parking activities take place on the opposite side of the building. Additionally, no plant equipment was observed on this elevation, and as such, there was no noticeable noise from the Yodel warehouse.
- 1.4 We understand that three additional units will be constructed as part of the Tritax Halsnead development. We note the presence of two existing dwellings situated between the units and the development land. It is our understanding that a noise impact assessment has been carried out for the new units, considering the closest dwelling. Consequently, the proposed noise control measures would be expected to also ensure adequate protection for these dwellings.
- 1.5 To the west is agricultural land and to the east is Fox's Bank Lane. The M62 is the only significant source of noise in the local area, with Fox's Bank Lane being a relatively lightly trafficked lane.
- 1.6 The latest site layout issued by DK-Architects (Ref: 1367-1001B 2025) is shown in Figure 2. The layout shows a substantial buffer between the northern site boundary adjacent to the M62 and the first row of proposed dwellings, with distances from the dwellings facades to nearside carriageway of the motorway in excess of 50 metres.
- 1.7 The northern area of the site includes several apartment blocks which do not feature rear gardens, whilst a small number of dwellings are positioned with their rear gardens orientated side-on to the motorway.

- 1.8 In addition, the north-eastern corner of the site incorporates a significant landscaped area that rises by around 4 metres, providing a natural bunding effect. The recommendations presented in this report are based on the current layout and reflect the need for appropriate noise mitigation in accordance with the proposed arrangement of buildings and open space.
- 1.9 The noise assessment has included:
- i. An inspection of the development site and surrounding area;
 - ii. Measurement of road noise levels on the development land;
 - iii. Measurement of any noise on the development site from commercial premises located close to the site;
 - iv. Assessment of the potential noise impact on the development land; and
 - v. Recommendations for noise mitigation measures.
- 1.10 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 GUIDANCE AND ACOUSTIC DESIGN CRITERIA

National Planning Policy Framework (December 2024)

- 2.1 Paragraph 198 of the National Planning Policy Framework (NPPF) 2024 states that planning policies and decisions should *“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;”*
- 2.2 A requirement of Paragraph 200 of the NPPF is that new development can be integrated effectively with existing businesses. Existing businesses 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 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. Thus, for this development, if it is found that there is adverse noise impact from the existing commercial premises it is incumbent on the housing developer to incorporate adequate noise mitigation into the residential development to protect the amenity of the new residents but also to safeguard the business interests of the commercial operator.

Noise Policy Statement for England (2010)

- 2.3 The Noise Policy Statement for England (NPSE) 2010, which is referred to in the NPPF, includes three aims:
- i. Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
 - ii. Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

- iii. Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

British Standard 8233: 2014, ‘Guidance on Sound Insulation & Noise Reduction for Buildings’

- 2.4 No specific guidance is given in the NPPF on acoustic design criteria, therefore, the guidance discussed below has been used for acoustic design purposes.
- 2.5 Guidance on acceptable noise levels in habitable rooms and private gardens is set out in British Standard 8233: 2014, ‘Guidance on sound insulation and noise reduction for buildings’. BS 8233 recommends that it is desirable that noise from external sources does not exceed the guidelines values that are shown in Table 1 inside habitable rooms for daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods.

Table 1: BS 8233:2014 Recommended Acoustic Design Criteria (dB $L_{Aeq,T}$)

Activity	Location	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

- 2.6 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_{AFmax} values and these can be highly variable and unpredictable.

Acoustic Design Criteria

- 2.1 For this development we therefore recommend the following noise criteria be adopted in respect of road traffic noise with windows closed and trickle ventilation provided:
- Daytime noise below 35 dB $L_{Aeq,16hr}$ inside living rooms and bedrooms, 40 dB $L_{Aeq,16hr}$ inside dining rooms; and
 - Night-time noise levels not exceeding 30 dB $L_{Aeq,8hr}$ and generally not exceeding 45 dB L_{AFmax} in bedrooms (i.e. no more than 10 times per night).

- 2.2 For private outdoor amenity spaces of the new houses (e.g. rear gardens) BS8233 states that 'it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments'. In our experience, most local planning authorities have traditionally adopted, or accepted, the 55 dB(A) guideline value for rear gardens of proposed new residential developments near busy roads.
- 2.3 However, the Standard also recognises that these guideline values are not achievable in all circumstances where development might be desirable and, in such cases, for sites near to the 'strategic transport network' higher noise levels than 55 dB $L_{Aeq,16hr}$ in gardens may be acceptable.
- 2.4 Nevertheless, for this development, we have adopted a criterion of 55 dB $L_{Aeq,16hr}$ for gardens as far as is practicable.
- 2.5 Our outline noise mitigation recommendations are described in Section 4.0.

3.0 ROAD TRAFFIC NOISE SURVEY

- 3.1 A noise survey has been carried out in order to determine representative M62 road traffic noise levels at the site. The locations are indicated in Figure 1 and are described below: -.
1. 2m from boundary fence with M62
 2. 65m from boundary fence with M62 (menage paddock)
- 3.2 The noise survey was carried out between approximately 11:00 on Wednesday 29th January and 11:00 Thursday 30th January 2025.
- 3.3 Noise measurements were taken in consecutive 2-minute measurement periods for at least 24 hours at both locations, and the surveys were carried using a NTi Audio XL2 'Class 1' sound level meters (s/n: A2A-20361-E0) and a NTi Audio XL3 'Class 1' Sound level meter (s/n: A3A-01451-F0)
- 3.4 All surveys were undertaken in dry conditions, Daytime temperatures ranged between 7°C and 8°C, while night-time temperatures were between 2°C and 4°C. The weather remained predominantly overcast, with light north westerly winds of approximately 2-3 m/s. Full details of the instrumentation used for the noise surveys, together with notes on weather conditions, etc. are provided in Appendix II.
- 3.5 Calibration checks were carried out both before and after the measurement periods with no variance in levels noted. The noise measurements were taken in '*free field*' conditions and at a microphone height of approximately 1.5m above the ground.
- 3.6 The measured day time and night-time L_{Aeq} values have been averaged logarithmically to obtain Daytime (07:00 – 23:00) $L_{Aeq,16hr}$ and Night-time (23:00 – 07:00) $L_{Aeq,8hr}$ values
- 3.7 The full results of the traffic noise survey are shown in Appendix II, and the noise exposure values are shown in Table 1:

Table 2: Road Traffic Noise Exposure Levels (dB $L_{Aeq,T}$)

Location	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$
1. 2m from boundary fence with M62	72	67
2. 65m from boundary fence with M62	64	59

4.0 CALIBRATION OF NOISE MODEL

- 4.1 Noise calculations have been carried out using the CadnaA noise prediction software for daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods. The technique uses a 3-dimensional computer model of the topography of the site and the surrounding area as a basis for undertaking automated noise calculations.
- 4.2 Geographical information for the site and its surroundings, including ground level data, has been obtained from Ordnance Survey digital mapping. The proposed bunding has also been incorporated into the noise model.
- 4.3 Using the results of the road traffic noise surveys initial iterations of the noise propagation model have been generated to provide predicted $L_{Aeq,16hr}$ daytime at 1.5m and $L_{Aeq,8hr}$ night-time noise levels at 4.5m above local ground. Residential blocks have been incorporated into the model to demonstrate the likely effects of development buildings on the site upon road traffic noise propagation. T
- 4.4 The noise contour plans for the model incorporating the proposed landscaping, with a 3.0 m acoustic barrier positioned in the area beyond the extent of the bunding and close to the motorway are presented in Figure 3 for the daytime and Figure 4 for the night-time
- 4.5 The results of these calculations have been used to assess the level of sound insulation that is necessary for the windows and ventilation of habitable rooms of the proposed dwellings and form the basis of the outline noise control recommendations in Section 5.0.

5.0 RECOMMENDED SCHEME OF NOISE MITIGATION

- 5.1 Based on the layout, the computerised noise models indicate predicted daytime noise levels at residential façades of up to about 65 dB $L_{Aeq,16hr}$ close to the motorway in the eastern part of the site. The corresponding predicted night-time noise levels are up to about 61 dB $L_{Aeq,8hr}$ in the eastern part of the site.
- 5.2 Therefore, based on the predicted noise levels, it will be necessary to incorporate noise mitigation measures to ensure adequate control of road traffic noise in habitable internal areas and external living areas for a number of dwellings close to the motorway.
- 5.3 Based on this assessment, subject to careful implementation of noise mitigation measures, potentially including those set out below, there is not considered to be any material constraint to implementing measures that secure acceptable internal and outdoor acoustic conditions for residential purposes across the site, in accordance with the guidelines set out in BS 8233.

External Noise Criteria

- 5.4 The earth bunding forming part of the landscaped public open space to the eastern area of the site is already included in the proposed plans, with a height of 4 m. To ensure adequate acoustic protection for the dwellings located towards the western part of the site, it is recommended that this bunding be supplemented by a 3 m high acoustic barrier along the remainder of the boundary, as shown in Figure 2.
- 5.5 Proprietary acoustic fences, which are specifically designed to reduce sources of noise such as road traffic, are available from a number of specialist suppliers which include Jacksons Fencing (jacksonsfencing.co.uk), Guardian Fencing (guardianfencing.com) and Ransfords (ransfords.co.uk).
- 5.6 The acoustic barriers must be imperforate (i.e. have no holes or gaps along their length or at the base) and have a surface mass no less than 10 kg/m². If formed of timber fencing should be at least 20mm thick and have double-rebated boards; cover strips; and gravel boards at the base. Where required, gates in the acoustic fencing would be acceptable as long as they are built to the same specification as the fence itself.

- 5.7 The results of our computerised noise modelling indicate that specific plots require additional noise mitigation measures to meet the external noise criteria in private rear gardens. The location and height of these fences are shown in Figure 2.

Glazing

- 5.8 Windows of standard well-sealed thermal double glazing (4mm glass – 4mm glass) have a typical sound reduction performance of 25 dB $R_w + C_{tr}$. Therefore, where traffic noise levels exceed (façade values) of 60 dB $L_{Aeq,16hr}$ during the daytime and/or 55 dB $L_{Aeq,8hr}$ and/or 70 dB $L_{Amax(10th\ highest)}$ at night, higher specification glazing will be necessary.
- 5.9 From the survey results these threshold values will be exceeded in the eastern area, particularly where the landscaping is unable to fully screen motorway noise.
- 5.10 We therefore recommend that the living room and bedroom windows of the nearest houses to the motorway are fitted with upgraded double glazing with a sound insulation performance as high as 32 dB $R_w + C_{tr}$ (shown in Green on Figure 2). Typically, this would be achieved with double glazing specifications of:
- (32 dB $R_w + C_{tr}$) 10mm glass - nominal (12-20mm) cavity – 6.4mm glass.
- 5.11 Windows in the living rooms and bedrooms of dwellings in the centre will require upgraded double glazing with a sound insulation performance of up to 28 dB $R_w + C_{tr}$ shown in Blue on Figure 2). Typically, a sound insulation performance 28 dB $R_w + C_{tr}$, (can be achieved with double glazing specifications such as
- (28 dB $R_w + C_{tr}$) 4mm glass – 12mm cavity – 4.4mm Stadip Silence Acoustic Laminated Glass
- 5.12 For both living rooms and bedrooms of dwellings to the west of the site standard thermal double glazing likely to be adequate, this also applies to other houses on the site that are further away from the motorway and or screened effectively by other houses.

Ventilation

- 5.13 Also, for all habitable rooms for which sound insulated windows are necessary, we recommend that specialist acoustic vents are fitted instead of standard window frame slot vents. Various types of acoustic vents are commercially available. However, in terms of acoustic performance, for exposed

living rooms we would recommend types such as the Greenwood EAR42W 3-part system, comprising humidity sensitive indoor unit, acoustic sleeve, and outdoor acoustic canopy or wall mounted Ryton AAC125HP units, both of which have a good acoustic performance rating of over 42 dB $D_{n,e,w}$.

- 5.14 For the most exposed bedrooms and living rooms, acoustic vents of a higher rating of 50 dB $D_{n,e,w}$ may be necessary which would require larger wall mounted passive units (e.g. Greenwood Type MA3051 Acoustic Wall Ventilator) or powered through-wall types (e.g. Titon Sonair F+).
- 5.15 Standard thermal double glazing and standard slot vents are likely to be adequate for other houses on the site that are further away from the motorway and or screened effectively by other houses, however this should be reviewed when a layout drawing is available.
- 5.16 The precise specifications of all noise mitigation measures will be subject to detailed design, however the above demonstrates that adequately controlling internal and external noise levels in accordance with the guidelines set out in BS 8233 will be readily achievable.
- 5.17 It is noted that the above recommendations do not take account of the requirement of Approved Document O of the Building Regulations (ADO), as that is not a planning matter.
- 5.18 It should however be noted that the provisions of ADO will require that mechanical ventilation for dwellings in the areas of development in proximity to the M62 motorway.

External Walls

- 5.19 The exact construction of the external walls is not known at this stage however it is assumed that the sound insulation performance of the wall construction will not be less than 50 dB R_w . This can be achieved using standard wall constructions, without any specific acoustic enhancements.

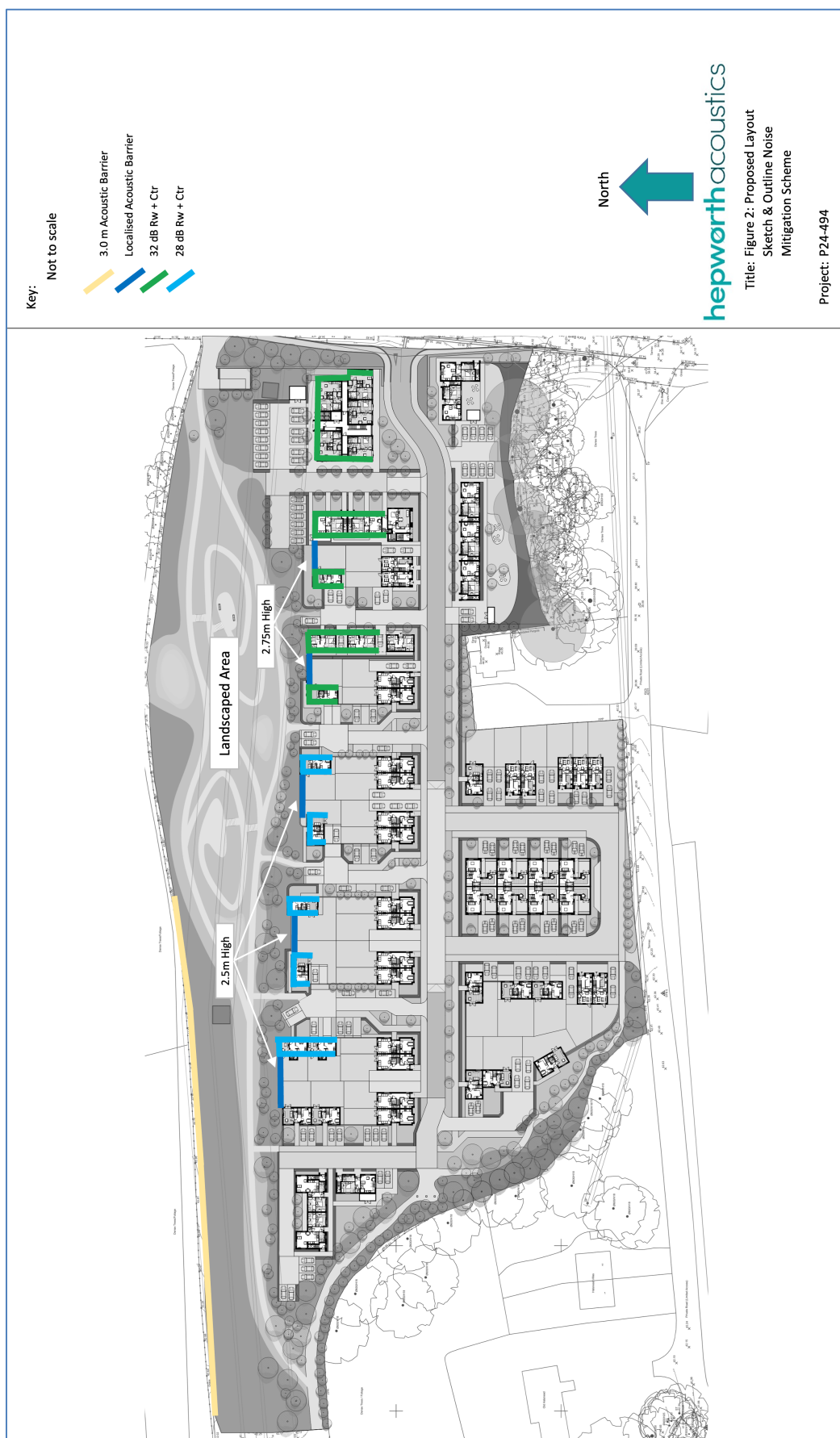
Planning Condition

- 5.20 The need to ensure that an adequate scheme of noise mitigation is implemented can be formalised by an appropriately worded planning condition that requires a scheme of noise mitigation measures as described in this report to be implemented prior to occupation of relevant dwellings.

6.0 SUMMARY AND CONCLUSION

- 6.1 The impact of motorway traffic noise has been assessed for a proposed residential development on land to the west of the M62 at Halsnead Farm in Knowsley
- 6.2 Traffic noise levels have been measured on the development land for daytime and night-time periods.
- 6.3 British Standard guideline acoustic design criteria have been adopted that will ensure the protection of residential amenity. However, to achieve these criteria it will be necessary to implement noise mitigation measures for development in the northern area of the site nearest to the M62.
- 6.4 We have recommended that an appropriate scheme of sound insulation is implemented for the new houses that will be most exposed to traffic noise in order to protect the amenity of the new residents.
- 6.5 The implementation of an adequate scheme of noise mitigation measures as described in this report can be ensured by the use of an appropriately worded planning condition.









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

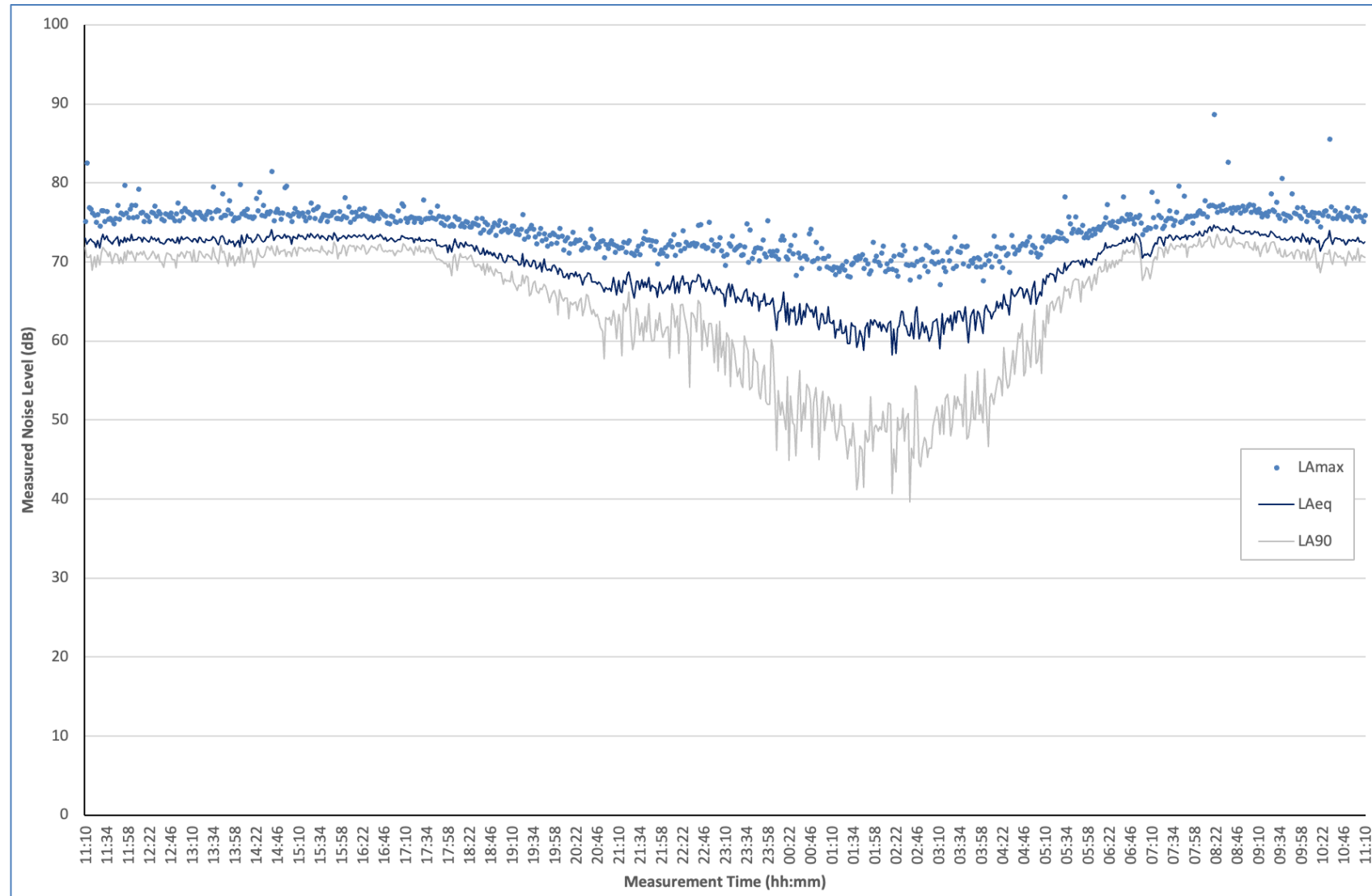
When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) 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.

- C_{tr} This is an A-weighted urban traffic noise spectrum, which can be added to $D_{nT,w}$ or R_w in some standards to take into account different source spectra such as low frequency sound.
- R_w This is the 'Weighted Sound Reduction Index', and is a single figure quantity of R , the laboratory measured Sound Reduction Index.
- $L_{Aeq,T}$ 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, $L_{Aeq,T}$ 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_{AFmax} This is the maximum A-weighted noise level that was recorded during the measurement period in terms of 'Fast' time weighting.
- $L_{A10,T}$ 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 noise level exceeded for 90% of the time period. $L_{A90,T}$ is used as a measure of background noise.

Appendix II: Noise Survey Results

Date(s):	Wednesday 29 th – Thursday 30 th January 2025
Equipment:	NTi XL2 'Class 1' sound level meter (s/n: A2A-20361-E0) with associated calibrator and environmental outdoor monitoring kit NTi XL3 'Class 1' sound level meter (s/n: A3A-01451-F0) with associated calibrator and environmental outdoor monitoring kit
Weather:	Wednesday, 29th January 2025: Daytime: Dry, Cool, 8°C (high), 7°C (low), overcast skies, light north westerly winds (~3 m/s). Night-time: Dry, Cool, 4°C (high), 4°C (low), overcast skies, light north westerly winds (~2 m/s). Thursday, 30th January 2025: Daytime: Dry, Cool, 8°C (high), 7°C (low), overcast skies, light north westerly winds (~3 m/s).

All levels in dB(A)

Location 1: 2m From Boundary Fence

Location 2: 65m From Boundary Fence