



**GLEN DIMPLEX, KNOWSLEY
PROPOSED RESIDENTIAL DEVELOPMENT**

NOISE ASSESSMENT

On behalf of:
Taylor Wimpey

GLEN DIMPLEX, KNOWSLEY PROPOSED RESIDENTIAL DEVELOPMENT

NOISE ASSESSMENT

Report number	Prepared by	Prepared for
P25-340-R01	Hepworth Acoustics Ltd 21 Little Peter Street, Manchester M15 4PS manchester@hepworth-acoustics.co.uk 0161 242 7900	Taylor Wimpey

Version	Date	Author	Checked by	Notes
1	17.09.25	J Shaw BSc MIOA Senior Consultant	G Bowland BSc MIOA Technical Director	Initial issue
2	10.11.25	J Shaw BSc MIOA Senior Consultant	G Bowland BSc MIOA Technical Director	Layout Update
3	03.08.26	J Shaw BSc MIOA Principal Consultant	G Bowland BSc MIOA Technical Director	Layout Update

This report has been created exclusively for the benefit, use, and information of the client, in accordance with the purposes outlined in the report. Hepworth Acoustics Ltd's liability regarding the information contained in the report does not extend to any third party.

© 2026 by Hepworth Acoustics Ltd

Registered in England no. 2387226

Registered office: 21 Little Peter Street, Manchester M15 4PS

www.hepworth-acoustics.co.uk

TABLE OF CONTENTS

1. INTRODUCTION	1
2. ACOUSTIC CRITERIA	2
3. ROAD TRAFFIC NOISE SURVEY	6
4. COMMERICAL NOISE SURVEY	7
5. NOISE SURVEY OF SCHOOL AND RAILWAY LINE	9
6. NOISE MITIGATION SCHEME	11
FIGURE 1: SITE LOCATION & NOISE MEASUREMENT POSITIONS	14
FIGURE 2: SITE LAYOUT AND NOISE MITIGATION SCHEME	15
APPENDIX A: ACOUSTICS UNITS & INDICES	16
APPENDIX B: NOISE SURVEY RESULTS	18

1. INTRODUCTION

- 1.1 Hepworth Acoustics was commissioned by Taylor Wimpey to carry out a noise impact assessment in connection with a proposed residential development on land of the Glen Dimplex factory in Prescot. The site Location is shown in Figure 1.
- 1.2 We understand that the proposal is for the construction of 205 dwellings across the site with all existing factory and ancillary buildings to be demolished as part of the site redevelopment. The proposed layout is shown in Figure 2.
- 1.3 To the north, the site is bounded by Stoney Lane, with Whiston Hospital and existing residential dwellings located beyond. To the west, the boundary adjoins the rear gardens of properties on Cumber Lane.
- 1.4 To the south, the site adjoins St Edmund Arrowsmith Catholic Academy, a secondary school with associated playing fields and green space. Beyond the school, the Liverpool to Manchester railway line runs parallel and at grade to the site. The proposed layout places a small number of dwellings at a distance of approximately 100 metres from the railway.
- 1.5 On the eastern boundary, the site is adjacent to Elis, a commercial laundry facility. Vehicle access to Elis is taken from the opposite side of the building (away from the site), though vehicle movements occur around the building with the Elis site exit located close to the boundary with the proposed development site. A small number of loading bays also face towards the proposed development. It is understood that Elis operates from 06:00 until the early evening, with vehicle arrivals and departures beginning from 06:00 onwards.
- 1.6 There are a number of noise sources on the site and therefore the noise assessment has included:
- An inspection of the development site and surrounding area;
 - Measurement of road noise levels on the development land;
 - Measurement of railway noise levels on the development land;
 - Measurement of any noise on the development site from the school and commercial premises located close to the site;
 - Assessment of the potential noise impact on the development land; and
 - Recommendations for noise mitigation measures.
- 1.7 The various noise units and indices referred to in this report are described in Appendix A. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2. ACOUSTIC CRITERIA

National Planning Policy Framework (2024)

- 2.1 Paragraph 198 of the National Planning Policy Framework (NPPF), December 2024, 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;”*
- 2.2 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, and in doing so 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.

BS 8233:2014 ‘Guidance on sound insulation and 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*’, which carries the full weight of an adopted British Standard. 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 $L_{Amax,F}$ values and these can be highly variable and unpredictable.

BS 4142:2014+A1:2019 ‘Methods for rating and assessing industrial and commercial sound’

- 2.7 British Standard 4142:2014+A1:2019, ‘Methods for rating and assessing industrial and commercial sound’ (referred to hereafter as BS 4142) is the appropriate guidance for assessing the potential noise impact at residential locations from commercial and industrial sources.
- 2.8 BS 4142 requires a ‘rating’ level ($L_{A,r,T,r}$) calculated from the operation of the noise source to be compared with the background sound level ($L_{A90,T}$) which is measured in the absence of the noise source. The noise is evaluated over a 1-hour period for daytime operations (i.e. 07:00 - 23:00) and 15-minute period for night-time operations (i.e. 23:00 - 07:00).
- 2.9 The rating level ($L_{A,r,T,r}$) is based on the ‘specific’ sound level ($L_{A,r,T,r}$) attributed to the operating noise source, with ‘character corrections’ added for sound sources where ‘certain acoustic features can increase the significance of impact’.
- 2.10 The acoustic character correction applied to the specific sound level in order to obtain the rating level can take into account tonality, intermittency, impulsivity and characteristics otherwise distinctive against the prevailing noise climate in the area.
- 2.11 An initial estimate of the potential noise impact from the operating noise source is determined by comparing the difference between the background level and the rating level.
- 2.12 Regarding the outcome of the initial estimate, BS 4142 states that:
- Typically, the greater this difference, the greater the magnitude of 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; and,
- 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 is does not exceed the background sound level, this is an indication of the specific sound source having low impact, depending on the context.

2.13 BS 4142 also states in respect of background sound levels that *“it is important to ensure that values are reliable and suitably represent the particular circumstances and periods of interest... the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”*.

2.14 BS 4142 states that all pertinent factors must be taken into account regarding the context in which the noise occurs, including but not limited to:

- The absolute level of sound.
- The character and level of the residual sound compared to the character of the specific sound; and,
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will incorporate design measures that ensure good internal and/or outdoor acoustic conditions such as acoustic screening.

2.15 The initial numerical assessment and the context are then both taken into account when determining the potential noise impact.

Acoustic Design Criteria

2.16 For this development we therefore recommend the following noise design criteria be adopted with windows closed and trickle ventilation provided:

- Daytime noise not exceeding 35 dB LAeq inside living rooms and bedrooms, 40 dB LAeq inside dining rooms; and
- Night-time noise levels not exceeding 30 dB LAeq and generally not exceeding 45 dB LAmax in bedrooms (i.e. no more than 10 times per night)

2.17 For private outdoor amenity spaces of the new houses (e.g. rear gardens) BS 8233 states that *“it is desirable that the external noise level does not exceed 50 dB LAeq,T with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environment”*. 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 LAeq,T in gardens may be acceptable.

2.18 Nevertheless, for this proposed residential development, we have adopted an acoustic design criterion of within 55 dB $L_{Aeq,16hr}$ for private rear gardens of all the new dwellings.

3. ROAD TRAFFIC NOISE SURVEY

- 3.1 In all but the former social club which was part of the Glen Dimplex factory car park the site boundary with Stoney Lane is lined with a concrete panel fence of more than 2.4m in height. Therefore, road traffic noise measurements were carried out in the car park of the club at the noise measurement location indicated in Figure 1 5m from nearside kerb of Stoney Lane
- 3.2 The noise measurements were taken in consecutive two minute periods between 12:00 on Tuesday 9th September and 12:00 on Wednesday 10th September 2025.
- 3.3 The noise survey was carried out using a Rion NA-28 'Class 1' integrating sound level meter (s/n: 00960036) independently calibrated within the preceding 24 months. Acoustic calibration of the sound level meter was carried out before and after the noise measurements using an acoustic calibrator that had been independently calibrated within the preceding 12 months. No significant variation in the calibrated noise level was noted.
- 3.4 The noise measurements have been carried out in compliance with BS 7445: 2003. The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.5m above the ground. Octave band frequency analysis was also carried out to assist with the design of sound insulation measures.
- 3.5 During the survey, the weather conditions were suitable for noise monitoring, with full details provided in Appendix B.
- 3.6 The measured daytime (07:00-23:00) and night-time (23:00-07:00) L_{Aeq} values have been logarithmically averaged to obtain the actual $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ values respectively.
- 3.7 The full results of the traffic noise survey are shown in Appendix B, and a summary is provided in Table 2 below.

Table 2: Road Traffic Noise Exposure Levels (dB)

Location	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$
1. 5m from Stoney Lane	56	49

- 3.8 Peaks of noise at night were in the range 38 – 70 dB L_{Amax} at Location. The 10th highest measured night-time L_{Amax} value was 68 dB.

4. COMMERCIAL NOISE SURVEY AND ASSESSMENT

- 4.1 An unattended noise survey was carried out at a location on the site that is representative of the dwellings closest to the Elis Commercial Laundry between approximately 12:00 on Wednesday 27th August and 12:00 on Thursday 28th August 2025. The measurement position is indicated as Location 2 on Figure 1.
- 4.2 The noise measurements during both surveys were carried out in consecutive 5-minute intervals using a NTi Audio XL2 'Class 1' integrating sound level meter (Serial No.: A2A-20361-E0). Calibration checks were carried out before and after the noise survey with no variance in levels observed.
- 4.3
- 4.4 During the survey, the weather conditions were suitable for noise monitoring, with full details provided in Appendix B.
- 4.5 The noise measurements have been carried out in compliance with BS 7445: 2003. The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.5m above the ground. Octave band frequency analysis was also carried out to assist with the design of sound insulation measures.
- 4.6 The full results of the noise surveys are shown in Appendix B and are summarised in Table 3 below:

Table 3: Summary of measured noise levels (dB)

Location	Daytime 07:00-23:00		Night-time 23:00-07:00		
	L_{Aeq} 49	L_{A90}	$L_{Amax, 10th\ Highest}$	L_{Aeq} 49	L_{A90}
1. 1m From Boundary with Elis	50	46	69	47	42

- 4.7 From a review of the audio recordings the yard was in use from 06:00 in the morning.
- 4.8 An 'ambient sound level' of 52 dB L_{Aeq} was measured close to the boundary of the site from service yard activities including vehicle movement. The 'residual sound level' (when there were no yard activities just before 06:00) was 47 dB L_{Aeq} , therefore the residual noise is influencing the measured ambient noise level such that the specific sound level is 50 dB L_{Aeq} .
- 4.9 The activity in the yard does not result in impulsive sound, nor include tonal elements. However, vehicle movements are sporadic and as such a 3 dB 'acoustic feature penalty' for intermittency has been applied. On this basis, the BS 4142 initial numerical assessment is shown in Table 4.

Table 4: Initial Numerical BS4142 Assessment of Elis Yard Operations (dB)

Description	Daytime 07:00 – 23:00	Night-time 06:00 – 07:00
Calculated Specific sound level at Boundary	50	50
Character correction	+3	+3
Rating level at Boundary ($L_{Ar,Tt}$)	53	53
Background sound level ($L_{A90,7}$)	45	43
Difference	+8	+10
Initial estimate	<i>'Significant Adverse Impact'</i>	<i>'Significant Adverse Impact'</i>

- 4.10 The 'rating sound level' from activities at Elis is 8 dB above the representative background sound during the daytime and 10 dB above the background during the last part of the night.
- 4.11 In terms of a BS 4142 assessment the conclusion is of an indication of a 'significant adverse impact, depending on the context' for the daytime and night time periods, in the absence of any additional noise mitigation measures.
- 4.12 However, it should be noted that the rating location is at the site boundary and absolute levels are fairly low and subject to careful design and some mitigation it will be straightforward to implement a suitable scheme of noise mitigation.

5. NOISE SURVEY OF SCHOOL AND RAILWAY LINE

- 5.1 Noise measurements were undertaken at a location on the site close to the boundary with the railway line, as indicated as 'Location 3' on Figure 1. Owing to the site's proximity both to the railway line and to St Edmund Arrowsmith Catholic Academy to the south, the survey position was selected so that noise from each of these sources could be appropriately considered.
- 5.2 The location of the nearest proposed dwellings to the railway was not accessible for monitoring, and it was therefore not possible to obtain direct measurements at this position. As such, railway noise levels at the closest dwellings have been established by calculation, based on the measured data and appropriate propagation corrections.
- 5.3 During the survey, there was no noise from school activities and therefore not considered a significant contributor to the overall noise climate at the development site.
- 5.4 With regard to the railway, the line appears to comprise continuously welded track, resulting in relatively smooth train movements. The line is moderately busy during the daytime but less so at night, although some large freight services do operate during the night-time period. The total number of trains using the line on a typical weekday is summarised in Table 5, based on relevant online timetable information.

Table 5: Daily Number of Passing Trains (Total 2-way Flow)

Train Type	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00
Passenger Trains	75	11
Freight Trains	Up to 25	Up to 14

- 5.5 Noise measurements were taken in consecutive 2-minute periods between approximately 12:30 on Tuesday 9th September and 12:30 on Wednesday 10th September 2025, during a period of normal train operations. The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.5m above the ground.
- 5.6 The noise monitoring was carried out using a Nti Audio XL2 'Class 1' sound level meter (Serial number A2A-20361-E0). Calibration checks were carried out before and after the noise survey with no variance in levels observed.
- 5.7 During the survey, the weather conditions were suitable for noise monitoring, with full details provided in Appendix B.
- 5.8 The noise measurements have been carried out in compliance with BS 7445: 2003. The noise measurements were taken in 'free-field' conditions and at a microphone height of approximately 1.5m above the ground. Octave band frequency analysis was also carried out to assist with the design of sound insulation measures.

- 5.9 The full results of the noise survey, including weather conditions are shown in Appendix B and the railway noise exposure values are shown in Table 6 below.

Table 6: Railway Noise Exposure Values

Location	Daytime $L_{Aeq,16hr}$ 07:00 – 23:00	Night-time $L_{Aeq,8hr}$ 23:00 – 07:00
2. 170m from boundary with Railway Line	50	47

- 5.10 Short-term peaks of noise at night at the measurement location were found to be up to 72 dB $L_{Amax, 2mins}$. The 10th highest L_{Amax} value measured was 67 dB L_{Amax}
- 5.11 The results indicate that the dominant external noise source influencing Location 3 is rail traffic on the adjacent Liverpool–Manchester line. Although occasional peaks were observed at night, these are consistent with typical freight movements and remain within a range that can be addressed through appropriate design measures. Allowance has been made within the assessment for dwellings located close to the railway line, where the influence of rail noise is greatest.
- 5.12 Noise from St Edmund Arrowsmith Catholic Academy was found to be negligible in comparison to the railway noise and is not expected to materially affect the overall noise climate at the proposed dwellings.

6. NOISE MITIGATION SCHEME

External Noise: Gardens

- 6.1 The calculated daytime traffic noise levels at the site were found to be up to 56 dB L_{Aeq} , in areas of the site closest to Stoney Road. The majority of rear gardens on the development will be well away from, and/or adequately shielded by the dwellings themselves from traffic noise such that noise levels are likely to be within 55 dB $L_{Aeq, 16hr}$ in most cases.
- 6.2 However, in the instances where this is not the case, or where there are gaps between houses, some noise mitigation will be necessary. In addition, the site layout plan indicates that a number of rear gardens will be orientated towards the Elis service yard, with dwellings positioned close to the site boundary. For those dwellings located nearest to Elis and given the findings of the BS 4142 assessment indicating a significant adverse impact, mitigation measures will be necessary to ensure that external noise criteria are satisfied.
- 6.3 For the dwellings marked on Figure 2 in Green, it is recommended that localised 2.0 meter-high acoustic fencing be installed along garden boundaries. The fencing should be constructed from solid timber boards with a minimum thickness of 20mm, incorporating double rebated edges or cover strips over the joints, with a minimum surface mass of 10 kg/m².
- 6.4 Gates in the fencing, if/where required, are acceptable as long as they are built to the same specification as the fence.
- 6.5 Suppliers of proprietary acoustic timber fencing include Jacksons Fencing (jacksons-fencing.co.uk), Guardian Fencing (guardianfencing.com) and Ransfords (ransfords.co.uk).

Noise Mitigation for Habitable Rooms

- 6.6 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 external noise levels exceed values of 60 dB $L_{Aeq, 16hr}$ during the daytime and/or 55 dB $L_{Aeq, 8hr}$ and/or 70 dB $L_{Amax, f}$ at night, higher specification glazing will be necessary.

Dwellings Close to Railway Line

- 6.7 Noise mitigation measures will be necessary to ensure that noise levels at residential areas close to the railway are sufficiently control.
- 6.8 The calculated daytime noise level measured at the site boundary, which is located 100 meters from the railway line itself, was 53 dB L_{Aeq} . Therefore no specific glazing or ventilation measures are required for living rooms.

- 6.9 However, peaks of noise at night require consideration. At 170 meters from the railway, peaks of noise were 73 dB $L_{Amax,f}$. The noise level would increase to approximately 76 dB $L_{Amax,f}$ at 100 metres. Given these levels, acoustic glazing and ventilation will be necessary for bedrooms in dwellings positioned close to the railway to ensure compliance with night-time internal noise level guidelines.
- 6.10 Therefore, for bedrooms of dwellings close to the railway, we recommend the following scheme of sound insulation as indicated as 'Mitigation Scheme 1' in Blue on Figure 2:
- 6.11 Bedrooms rooms fitted with double glazing of at least 30 dB $R_w + C_{tr}$. Typically, this would be achieved with a double-glazing specification of:
- 4mm glass –nominal (12-20mm) cavity– 6.4mm Stadip Silence Acoustic Laminated Glass.
- 6.12 For bedrooms located further away (as indicated as 'Mitigation Scheme in Red on Figure 2) we recommend double glazing of at least 28 dB $R_w + C_{tr}$.
- 6.13 Typically, this would be achieved with a double-glazing specification of:
- 4mm glass –nominal (12-20mm) cavity– 4.4mm Stadip Silence Acoustic Laminated Glass.

Dwellings Close to Elis

- 6.14 For dwellings directly overlooking the service yard of Elis, upgraded acoustic glazing (not less than 34 dB $R_w + C_{tr}$) for bedrooms and living rooms as well as acoustic trickle ventilation.
- 6.15 Typically, this would be achieved with the following:
- 8mm Stadip Silence Acoustic Laminated Glass –nominal (12-20mm) cavity– 8.8mm glass.

Ventilation

- 6.16 For all dwellings marked on Figure 2 we recommend specialist acoustic vents that have a rating of at least 42 dB $D_{n,e,w} + C_{tr}$ are installed:
- Aereco EHA2 '3-part' Acoustic Trickle Ventilators with internal acoustic humidity control, external acoustic canopy, and acoustic sleeve. (42 dB $D_{n,e,w} + C_{tr}$)
 - Rytons AAC125HP LookRyt AirCore Ventilator units. (43 dB $D_{n,e,w} + C_{tr}$).

Other Dwellings

- 6.17 Standard double glazing and standard slot vents can be expected to be suitable for the majority of houses on the site that are less exposed to road, railway and commercial noise.
- 6.18 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.

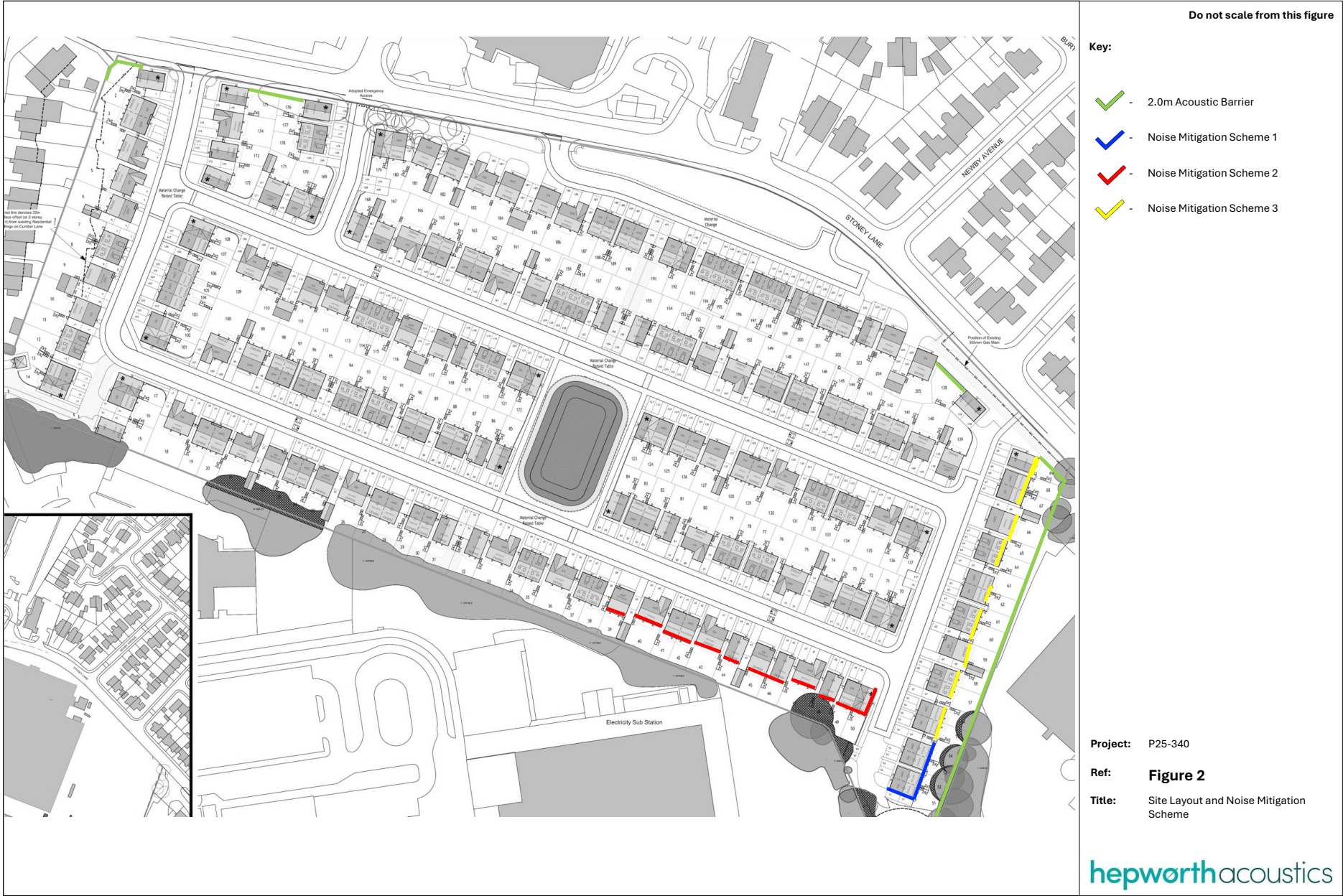
Planning Condition

- 6.19 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 to be implemented prior to occupation of relevant dwellings.

Conclusion

- 6.20 Subject to the recommendations for mitigation measures made above we conclude that potential noise impact from the railway, road traffic and the commercial/industrial premises would not result in any unacceptable harm to residential amenity by reason of noise disturbance. Also, the proposed noise mitigation measures would safeguard the business interests of the commercial/industrial premises and thus comply fully with paragraph 198 of the NPPF.
- 6.21 Furthermore, 'significant adverse impacts' would be avoided and 'adverse impacts' would be mitigated/minimised, bringing the development in line with the aims of the Noise Policy Statement for England (NPSE) 2010 and local policy.





APPENDIX A: ACOUSTICS 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. There are also a number of ways to describe sound insulation performance.

The indices used in this report are described below:

- $L_{Aeq,T}$** **A-weighted Equivalent Continuous Sound Level:** An average of the total sound pressure measured over a specified time period (T). 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}** **Maximum A-weighted Sound Level with Fast Time-weighting:** The maximum A-weighted sound pressure level during the measurement period, using the Fast time-weighting of 125ms. L_{Amax} used in this report refers throughout to L_{AFmax} with the Fast time weighting, denoted L_{AFmax} or $L_{Amax,f}$ in other documents but L_{Amax} in BS 8233:2014 standard notation.
- $L_{A90,T}$** **A-weighted 90 Percentile Level:** The A-weighted sound level exceeded for 90% of a measurement time period (T). $L_{A90,T}$ is generally used as a measure of Background Sound Level.
- $L_{Ar,Tr}$** **Rating Level:** An A-weighted value most commonly used in BS 4142 assessments, which is the sound level of the noise source under assessment, at the assessment location, evaluated over the reference assessment period (T_r) and includes numerical adjustments for the characteristic features of the sound.
- C_{tr}** **Transport Noise Spectral Adaptation Term:** A term used with single figure broadband sound insulation metrics (e.g. R_w , $D_{n,e,w}$ or $D_{nT,w}$) to account for the spectral composition of typical transport noise sources.
- $D_{n,e,w}$** **Weighted Element Normalised Level Difference:** A frequency weighted single figure laboratory value quantifying the sound insulation performance of a building element, such as an air vent.

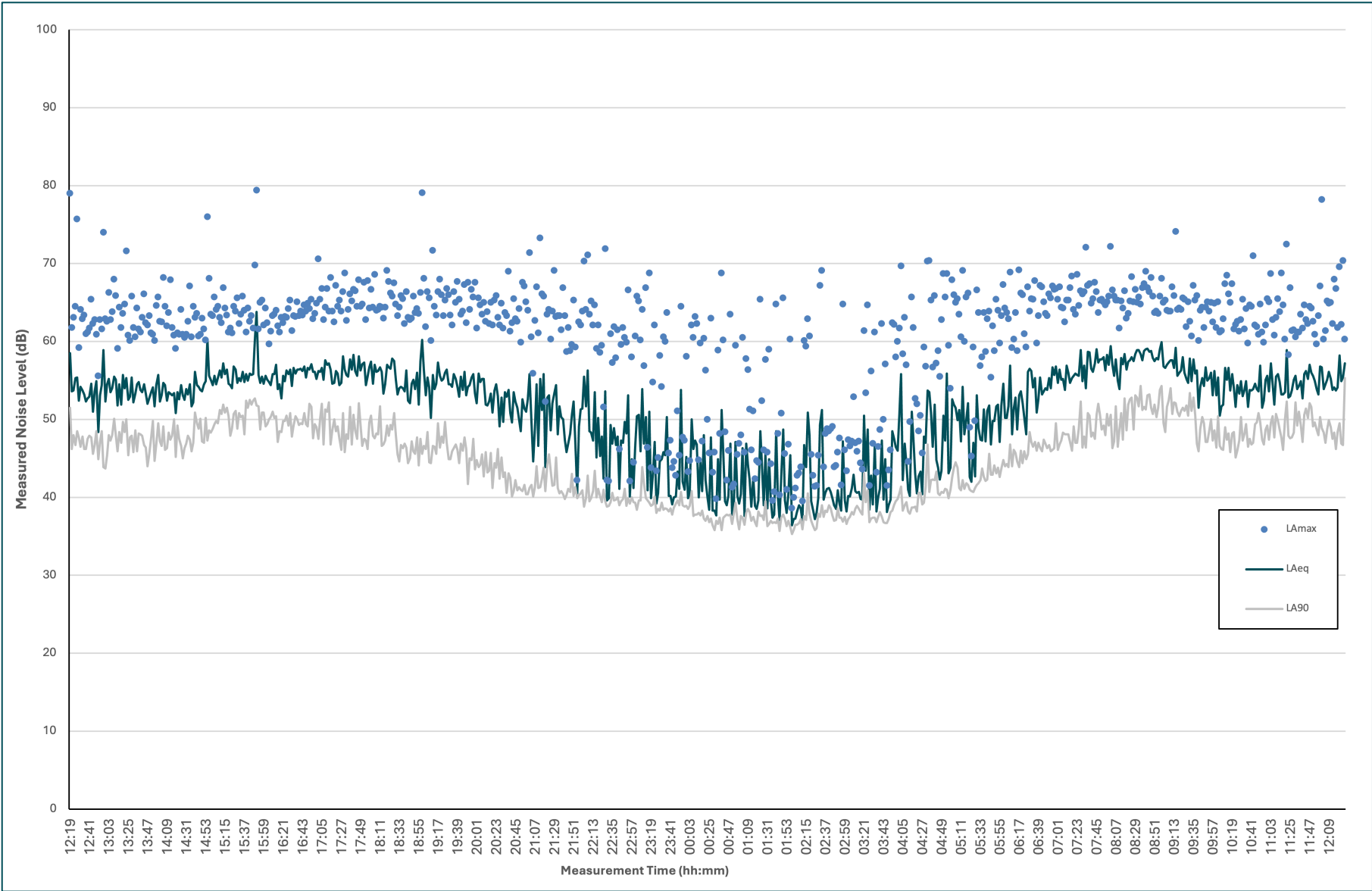
R_w

APPENDIX B: NOISE SURVEY RESULTS

Date(s)	Wednesday 27 August - Thursday 28 August 2025 Tuesday 9 September - Wednesday 10 September 2025
Equipment	NTi Audio XL2-TA 'Class 1' sound analysers (s/n: A2A-20361-E0) Rion NA-28 'Class 1' sound analyser (s/n: 00960036) with associated calibrator(s) and tripod(s)/environmental outdoor monitoring kit(s)
Weather	Wednesday 27 August - Thursday 28 August 2025 Daytime: 16 – 22 °C, clear, dry, SW wind <3 m/s Night-time: 13 – 14°C, clear, dry, S wind <4 m/s Tuesday 9 September - Wednesday 10 September 2025 Daytime: 16 – 18 °C, clear moving to partially overcast, dry, SE/SSE wind <3 m/s Night-time: 15 – 16°C, overcast, dry, SE wind <4 m/s

Chart(s) overleaf

Location 1: Stoney Lane



Location 2: Elis

