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# PROPOSED RESIDENTIAL DEVELOPMENT AT LAND WEST OF KING BUSINESS CENTRE, REEDS LANE, SAYERS COMMON

## NOISE ASSESSMENT

On behalf of:
**Reside Holdings Ltd**

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## NOISE ASSESSMENT

| Report number | Prepared by | Prepared for |
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# 1. INTRODUCTION

1.1 Hepworth Acoustics was commissioned by Reside Holdings Ltd to carry out a noise assessment in connection with a planning application for proposed residential development at a site known as land west of King Business Centre, Reeds Lane, Sayers Common.

1.2 The application is for the erection of 80 new residential dwellings (Use Class C3), including affordable housing units, vehicular, pedestrian and cycle access (including new footpath links to the east and west of the site along Reeds Lane), landscaping and open space, parking, sustainable drainage and other related works.

1.3 The site is currently an open field and is bounded as follows:

- To the south by Reeds Lane, which is a moderately trafficked road, with 60mph speed limit to most of the adjacent section.
- To the west by open fields, with the headquarters of AVTrade (providers of aircraft components) beyond to the west and Valley Farm Business Park further to the northwest.
- To the north by dense woodland.
- To the east by another new residential development in the northern area (in latter stages of construction phase at the time of this assessment) and by King Business Centre in the southern area, beyond an intervening track.

1.4 The boundary area at King Business Centre comprises Pavilion House to the south, which is an office type building, and Presentation House to the north, which is more of a light industrial type building, both with the nearest elevations close to the boundary of the track that intervenes between the proposed development site and King Business Centre.

1.5 The site location is identified in Figure 1.

1.6 The proposed development masterplan is shown in Figure 2.

1.7 The various acoustics indices referred to in this report are described in Appendix A. All noise levels in the text have been rounded to the nearest decibel as fractions of a decibel are imperceptible.

# 2. RELEVANT POLICY, GUIDANCE AND CRITERIA

## Mid Sussex District Plan 2014-2031 (Adopted March 2018)

2.1 Policy DP29: Noise, Air and Light Pollution of the Mid Sussex District Plan 2014-2031 states, with regard to noise that: "*The environment … and the quality of people's life will be protected from unacceptable levels of noise … pollution by only permitting development where … :*

- *It is designed, located and controlled to minimise the impact of noise on health and quality of life, neighbouring properties and the surrounding area*
- *If it is likely to generate significant levels of noise it incorporates appropriate noise attenuation measures*"

2.2 The policy states that "*Noise sensitive development, such as residential, will not be permitted in close proximity to existing or proposed development generating high levels of noise unless adequate sound insulation measures, as supported by a noise assessment are incorporated within the development. In appropriate circumstances, the applicant will be required to provide:*

- *an assessment of the impact of noise generated by a proposed development; or*
- *an assessment of the effect of noise by an existing noise source upon a proposed development*"

## Mid Sussex District Plan 2021-2039 Submission Draft (Regulation 19)

2.3 Currently in draft form, Policy DPN7: Noise Impacts of the Mid Sussex District Plan 2021-2039 Submission Draft requires that: "*People's health and quality of life and the natural environment, including wildlife, will be protected from unacceptable levels of noise*."

2.4 It is stated that development will only be permitted where it:

- Avoids significant adverse impacts on health and quality of life.
- Mitigates and minimises adverse impacts on health and quality of life.
- Where possible, contributes to the improvement of health and quality of life.

## Mid Sussex District Council – Position Statement 1: Delivering Sustainable Development in Mid Sussex

2.5 The Mid Sussex District Council – Position Statement 1: Delivering Sustainable Development in Mid Sussex states with regard to pollution that "*Development must not cause or be adversely affected by pollution or hazards, including … noise* [and] *vibration … Mitigation measures may need to be implemented for development that is likely to increase levels of pollution or hazards, taking into account any cumulative impacts.*"

## NPPF

2.6 The *National Planning Policy Framework* (NPPF), December 2024, states at paragraph 187 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 …*".

2.7 Paragraph 198 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 …*".

2.8 Paragraph 200 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*."

## NPSE

2.9 The Noise Policy Statement for England (NPSE) 2010, as referred to the in NPPF, includes three aims:

- 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.
- 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
- 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

2.10 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

2.11 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.

2.12 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.

2.13 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.

2.14 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.

2.15 Higher 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.

2.16 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.

2.17 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

2.18 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 $L_{Aeq,8hr}$ |

2.19 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*".

2.20 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.

2.21 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)*".

2.22 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. In this regard, ProPG: Planning & Noise 'Professional Practice Guidance on Planning & Noise' 2017 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*".

2.23 Regarding outdoor living areas, Clause 7.7.3.2 of 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 $L_{Aeq,T}$ 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*".

## BS 4142

2.24 British Standard 4142: 2014 +A1:2019, *Methods for rating and assessing industrial and commercial sound* provides methods for rating and assessing sound of an industrial nature from industrial or commercial premises.

2.25 This requires the sound from a specific source (in $L_{Aeq}$) to be compared with the existing background sound level ($L_{A90}$) outside residential locations. The standard also puts weight on the importance on the context in which the sound will occur.

2.26 The noise 'rating' level ($L_{Ar,T}$) 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.

2.27 BS 4142 stipulates that impacts should be assessed over a reference time interval 'T' of 1-hour during the daytime (0700-2300hrs) and 15-minutes during the night-time (2300-0700hrs).

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

- 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
- 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

2.29 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 noise, including "*where background noise levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds background. This is especially true at night*"
- The character and level of the residual noise
- The sensitivity of the receptor

# 3. BASELINE NOISE SURVEY

3.1 A site inspection and survey of prevailing noise levels at the site was carried out over the course of Tuesday 7 and Wednesday 8 October 2025.

3.2 From an initial inspection of the site, confirmed by observations made throughout the noise survey, it was apparent that the main noise source in most areas of the site is road traffic on Reeds Lane, albeit at a moderate level.

3.3 Towards the east, some noise was noted from fixed, external, ground-level plant items to the outside of the northern part of the west elevation of Pavilion House. It was not possible to visually inspect the plant fully, as this was mostly obscured by the intervening hedgerow. The noise was operational at all times, including the night-time, although with some variations in characteristic. This was seemingly due to different items cutting in and out, although some noise was present at all times, and also there was an occasional characteristic of a slightly louder 'clank / thud' type noise, seemingly as a release of pressure build-up, or similar.

3.4 With regard to Presentation House, it is understood that this is used as a car repair / restoration garage, apparently of daytime only operation. The building includes shutter openings to the east side, away from the proposed development site and hence no operational noise was observed from the site. There are a number of plant type flues / ducts on the roof of the building, however noise was perceived to be emitted from only one of these at any time during the noise survey, this being the northernmost flue. Although their precise status is not known, other rooftop plant elements appeared to be redundant and clearly are not in routine operation. The plant noise that was observed was present during normal daytime working hours only.

3.5 Some noise was observed from AVTrade, at distance to the west, and to a lesser extent from Valley Farm Business Park, at greater distance still to the northwest. This was sporadic in nature and characterised occasional muted bangs and thuds and moments of brief power-tool type noise.

3.6 The noise measurement locations are identified in Figure 1.

3.7 All noise measurements were carried out in free-field conditions and at a microphone height of 1.4m above local ground, except where stated.

3.8 The weather during the survey was dry and clear with a light and variable but predominantly westerly wind.

## Road Traffic Noise Measurements

3.9 Road traffic noise monitoring was carried out over a complete 24-hour period commencing at 1400hrs on Tuesday 7 October 2025 at Location 1, which was about 15m from the edge of the nearside carriageway of Reeds Lane and therefore representative of the nearest proposed residences to that road based on the proposed development masterplan shown in Figure 2.

3.10 The measured data from Location 1 have been processed into sequential 2-minute samples. The actual daytime $L_{Aeq,16hr}$ and night-time $L_{Aeq,8hr}$ noise exposure levels at Location 1 have been obtained from the logarithmic average of all the $L_{Aeq,2min}$ noise measurement samples over each of those periods.

3.11 To provide a robust interpretation of ProPG guidelines relating to $L_{Amax}$, the overall night-time $L_{Amax}$ noise levels at Location 1 have been determined for assessment purposes as the measured $L_{Amax,2min}$ exceeded no more than 10 times over the full night-time period.

3.12 The noise monitoring results are presented graphically in Appendix B. The overall road traffic noise levels at Location 1 are summarised in Table 2.

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

| Location | Daytime (0700-2300hrs) | Night-time (2300-0700hrs) | |
|---|---|---|---|
| | dB $L_{Aeq,16hr}$ | $L_{Aeq,8hr}$ | $L_{Amax}$ |
| 1 | 55 | 49 | 70 |

## King Business Centre Noise Measurements

3.13 Noise measurements were firstly undertaken of the plant at Pavilion House during the afternoon of Tuesday 7 October 2025, prior to understanding that the plant is operational outside of daytime hours. However, on finding that the plant remained operational into the evening, further higher-quality noise measurements (i.e. when other noise sources were at lower level) were undertaken at Location 2 during the evening of the same day.

3.14 Three sample noise measurements were undertaken over the period 2131-2227hrs at Location 2, which is on the site boundary line, at about 8m from the plant.

3.15 Each measurement sample was of duration of 15-minutes 'live' measurements time, albeit each actual measurement took slightly longer as the pause function on the sound level meter was deployed at times to eliminate the noise of very occasional passing vehicles on Reeds Lane.

3.16 From comparison to earlier observations, the variability in plant noise emissions captured over the course of each sample was representative of the general 'cycle' of plant noise noted earlier in the day. The measured noise level was 47dB $L_{Aeq,15min}$ for all samples and this again is consistent with the findings of the less straightforward daytime noise measurements.

3.17 The measured one-third octave band data presents a degree of tonality in the band centred at 80Hz, however not to an extent that would be classed as a prominent tone based on the 'Objective method for assessing the audibility of tones in sound: One-third octave method' as set out in BS 4142, and this was not distinctly perceptible.

3.18 Further to this, during the morning of Wednesday 8 October 2025 some brief noise measurements were undertaken at Location 3, during lulls in other noise. This was carried out with the measurement microphone elevated to >4m above local ground to consider the noise emissions from the flue identified as being noise-emitting at Presentation House. It is noted that Location 3 is somewhat nearer the plant than the development site, as was necessary to minimise the effects of extraneous residual noise. This location was about 5m laterally from the plant.

3.19 The measured noise levels have been considered in terms of the $L_{A90}$ index, as for the steady and continuous noise this may be taken as representative of the $L_{Aeq}$ and $L_{pA}$ noise level from the plant, while minimising the interference of other extraneous residual noise. The measured noise level was 42dB $L_{A90}$ at Location 3.

## Noise Measurements to the West of Site (including AVTrade and Valley Farm)

3.20 Three sample noise measurements were undertaken at Location 4, in 15-minute periods, in the late afternoon on Tuesday 7 October 2025, over the period 1641-1727hrs. Throughout the first sample, and the first half of the second period, some occasional intermittent, and distant, external service yard type noise from the AVTrade premises was observed, and to a lesser extent from Valley Farm Business Park. During the second half of the second period and throughout the third, no noise from those premises was noted. Nonetheless, the measured noise levels were 44-45dB $L_{Aeq,15min}$ and 40-41dB $L_{A90,15min}$, with no indication of higher noise levels during periods when noise from commercial noise was observed. This is consistent with the perception that the observed noise did not contribute significantly to the general ambient noise levels.

3.21 A further 15-minute noise sample was undertaken at Location 4 commencing at 2112hrs on Tuesday 7 October 2025. The measured noise levels were 38dB $L_{Aeq,15min}$ and 35dB $L_{A90,15min}$ and no commercial noise was observed.

3.22 Further to this, continuous noise monitoring was carried out in sequential 15-minute samples at Location 4 over the period 2300hrs on Tuesday 7 October 2025 until 1100hrs the following morning.

3.23 The noise monitoring results are presented graphically in Appendix B. The overall noise levels at Location 4 during this period are summarised in Table 3.

**Table 3: Summary of Noise Monitoring at Location 4**

| Location | | Morning (0700-1100hrs) | | Night-time (2300-0700hrs) | |
|---|---|---|---|---|---|
| | | dB $L_{Aeq,15min}$ | dB $L_{A90.15min}$ | dB $L_{Aeq,15min}$ | dB $L_{A90.15min}$ |
| 4 | Range | 35-53 | 33-49 | 35-48 | 30-45 |
| | Logarithmic Average | 47 | - | 41 | - |
| | Mean | - | 43 | - | 36 |
| | Mode | | 46 | | 36 |

## Equipment Details

3.24 The noise monitoring at Locations 1 was undertaken using a NTi Audio XL3 'Class 1' sound analyser (serial no. A3A-01459-F0).

3.25 The noise monitoring at all other locations was undertaken using a NTi Audio XL2-TA 'Class 1' sound analyser, (serial no. A2A-23512-E1).

3.26 Both measurement systems were field calibrated before and after use using a Norsonic Acoustic Calibrator, Type 1251 (serial no. 20804), with no variation in calibration level observed.

# 4. ASSESSMENT AND MITIGATION

## Road Traffic Noise

4.1 Considering road traffic noise from Reeds Lane as set out in Table 2, at the nearest proposed dwellings to this road, the noise levels fall into the low risk category of the ProPG guidance during the daytime and night-time.

4.2 Accordingly, the site may be considered acceptable for residential development from a road traffic noise perspective, subject to consideration and implementation of noise mitigation measures as necessary, in line with the 'good acoustic design' principles set out in ProPG guidelines.

4.3 With regard to controlling internal noise levels within proposed residences, no specific noise mitigation measures are considered necessary to control road traffic noise. Standard thermal double glazing (4mm glass - 12mm nominal cavity - 4mm glass), coupled with standard non-acoustic trickle vents will provide adequate sound reduction such that internal road traffic noise levels in line with BS 8233 / ProPG guidelines will be readily met (with windows closed and vents open).

4.4 It is noted that the above recommendations relating to internal road traffic noise do not take account of the requirement of Approved Document O of the Building Regulations (ADO), as that is not a planning matter. Indicatively, however, based on the foregoing and in line with ADO provisions, it is likely there may be a need for mechanical or alternative means of cooling for some bedrooms with a view towards Reeds Lane, subject to additional assessment.

4.5 Regarding noise levels in proposed rear gardens, the measured daytime road traffic noise levels at Location 1 are not in excess of the 'upper guideline value' set out in BS 8233, however, in this case, it is appropriate to aspire to the BS 8233 'desirable level'. Based on the proposed development masterplan in Figure 2, most proposed plots closest to Reeds Lane are oriented fronting outwards to the road, such that the residential buildings will provide substantial acoustic screening to the rear gardens. In isolated cases (specifically Plots 4 and 9 as per the proposed plan) the plots are proposed generally side-on to the road. In these cases, it is recommended the gardens are afforded additional protection by way of an acoustically effective garden fence/wall.

4.6 The recommended acoustic barrier should be a minimum of 1.8m above local ground height. The recommended acoustic barriers should be of overall mass not less than 10kg/m$^2$ and nominal thickness not less than 20mm (e.g. proprietary acoustic fencing or standard solid masonry wall). The construction should be imperforate with no holes or gaps and should be sealed at the base. The lateral extents to which this recommendation applies are indicated in Figure 2.

## Commercial Noise

4.7 Considering the noise from the fixed plant at Pavilion House, an initial estimate of the potential impact of this noise based on BS 4142 has been carried out.

4.8 It is noted from the proposed development masterplan in Figure 2 that plots towards the east of the site will generally back-on towards King Business Centre, including those closest to the Pavilion House plant, notably Plot 26 which is the nearest.

4.9 The assessment has therefore been undertaken on the basis of the daytime noise levels at 1.5m above local ground height at the centre of the Plot 26 garden (i.e. 16m laterally from the plant), and on the basis of the night-time noise levels at 4.5m above local ground at the Plot 26 rear elevation (i.e. (i.e. 22m from the plant).

4.10 In terms of the acoustic character of the noise, as noted, some slight tonality exists although this is not an extent that would be classed as a prominent. Accordingly, a +2dB correction is considered appropriate for a robust assessment. Also, although some noise is constantly present, there is a degree of variability, which it is considered amounts to intermittency, and hence a further +3dB correction is considered appropriate for a robust assessment.

4.11 The assessment background sound levels have been based on those measured at Location 4, taking the lower of the mean and mode values for each of the daytime and night-time situations to ensure a robust assessment.

4.12 BS 4142 assessments have been undertaken on the basis of both the daytime and night-time situations as set out in Table 4.

**Table 4: BS 4142 Initial Assessments, Without Additional Mitigation**

| Assessment Index | | Daytime Assessment | Night-time Assessment |
|---|---|---|---|
| Specific Sound Level dB $L_{Aeq,T}$ at Monitoring Location | | 47 | 47 |
| Distance Correction to Assessment Location dBA | | -6 | -9 |
| Specific Sound Level dB $L_{Aeq,T}$ at Assessment Location | | 41 | 38 |
| Acoustic Feature Corrections dB | Intermittency | +3 | +3 |
| | Just Perceptible Tonality | +2 | +2 |
| Rating Sound Level dB $L_{Ar,T}$ at Assessment Location | | 46 | 43 |
| Background Sound Level dB $L_{A90,T}$ | | 43 | 36 |
| Difference: Rating minus Background dB | | +3 | +7 |

4.13 The initial BS 4142 assessments in Table 4 show that, without any additional mitigation, for the daytime situation, the rating level will be up to 3dB above the representative background noise level. As per BS 4142, the indication for the daytime is therefore between one of a "*low impact*" and one of an "*adverse impact*" (though not amounting to a significant adverse impact), in either case "*depending on the context*".

4.14 For the night-time situation, the assessment rating level is 7dB above the representative background noise level. As per BS 4142, the indication for the night-time is therefore between one of an "*adverse impact"* one of a "*significant adverse impact*", again "*depending on the context*".

4.15 Notwithstanding the contextual factor that the 'absolute' specific plant noise level is low, it is considered in this case that additional noise mitigation measures are warranted.

4.16 Normally, for mitigation of noise of this type, it is preferred to control the noise as close to the source as possible. Clearly there is no straightforward means to applying noise control apparatus directly to the third-party owned equipment. Therefore, the next most suitable option will be to provide an acoustic screening barrier between the plant and proposed sensitive residential areas. The closer a barrier is to the plant, the more effective it can be acoustically, although care would be required to ensure that this does not adversely affect the operations of the plant, or occupants of Pavilion House.

4.17 As has been noted, the King Business Centre is separated from the proposed development site by an intervening track, which lies outside of the red line boundary. Nonetheless, we are informed that discussions have taken place between the applicant and other relevant parties, and that these have confirmed that the applicant has full rights to use, cross and undertake works to this land.

4.18 Therefore, it recommended, to provide an acoustic barrier close to the east edge of the track, in the location of the Pavilion House plant. The recommended lateral extents of this plant noise barrier are in Figure 2. The barrier should be no less than 2m in height and should be no greater than 2.5m laterally from the plant.

4.19 Based on frequency dependent Fresnel barrier calculations, this will result in overall acoustic screening reductions amounting to -8dBA for the daytime situation and -5dB for the night-time. The disparity is due to there being slightly lesser efficacy at first floor level and hence better efficacy at ground level.

4.20 The BS 4142 assessments have hence been revised to include the recommended mitigation as set out in Table 5. To note, for the assessments incorporating the recommended mitigation, the acoustic feature correction for intermittency has been retained, however the small correction previously included to account for a just perceptible tonal component has ben removed, as it is not anticipated that this will be at all discernible at the assessment locations based on the further reduced and hence very low sound levels.

**Table 5: BS 4142 Initial Assessments, With Additional Mitigation**

| Assessment Index | | Daytime Assessment | Night-time Assessment |
|---|---|---|---|
| Specific Sound Level dB $L_{Aeq,T}$ at Monitoring Location | | 47 | 47 |
| Distance Correction to Assessment Location dBA | | -6 | -9 |
| Acoustic Barrier Reduction dBA | | -8 | -5 |
| Specific Sound Level dB $L_{Aeq,T}$ at Assessment Location | | 33 | 33 |
| Acoustic Feature Corrections dB | Intermittent | +3 | +3 |
| Rating Sound Level dB $\underline{L}_{Ar,T}$ at Assessment Location | | 36 | 36 |
| Background Sound Level dB $L_{A90,T}$ | | 43 | 36 |
| Difference: Rating minus Background dB | | -7 | 0 |

4.21 The revised BS 4142 assessments in Table 5 therefore show that, with the recommended mitigation in place, the rating levels for both the daytime and night-time will be no greater than the representative background noise level. As per BS 4142, this is an indication of a "*low impact, depending on the context*".

4.22 Further to this, in contextual terms, the 'absolute' noise levels within mitigation in place are very low, and will be substantially below BS 8233 guideline values externally in gardens, and internally even with windows open, by an adequate margin that readily offsets any discernible character to the noise.

4.23 In addition to the lateral and vertical extents of the plant noise barrier already discussed, as with the recommended road traffic noise barriers for Plots 4 and 9, the plant noise barrier should be of overall surface mass not less than 10kg/m$^2$ and should be imperforate with no holes or gaps and should be sealed at the base.

4.24 Furthermore, to control potential reflective build-up of noise, including back towards the windows of Pavilion House itself, it is recommended that the acoustic barrier should be lined to the inner facing side (towards the plant) with acoustically absorbent panels, e.g. formed of ~100mm mineral fibre of density 10-60kg/m$^3$, retained behind perforated sheet steel.

4.25 As the recommended plant noise barrier is outside the development red line boundary, it is anticipated that it will be delivered via a Section 106 agreement.

4.26 Considering also the flue noise from Presentation House, based on the measured noise level of 42dB $L_{pA}$ at Location 3, at about 5m laterally from the flue, the calculated noise level at the centre of the nearest proposed gardens (i.e. Plots 29+30 as per Figure 2) at 22m from the plant is 30dB $L_{pA}$. This noise has no distinguishable acoustic features, and the calculated level is well below the daytime background noise level, applicable to the observed period of operation of the plant.

4.27 Therefore, consistent with subjective observations formed during the survey, this noise does not affect the residual dominant noise from general road traffic, such that, in line with ProPG guidelines, separate assessment to BS 4142 is not required or appropriate.

4.28 No specific mitigation measures are considered necessary with respect to the flue noise.

4.29 Similarly, considering noise from AVTrade and Valley Farm Business Park, at considerably greater distance to the west, the overall measured noise levels at Location 2, as set out in Table 3, fall into the negligible risk category of the ProPG guidance during the daytime and night-time.

4.30 Noting also that the attended noise measurements with and without representative contributions of any commercial type noise confirmed such noise to not be the dominant source, again in line with ProPG guidelines, separate assessment to BS 4142 is not required or appropriate.

4.31 Based on the noise levels at Location 4, no specific mitigation measures are considered necessary with respect to any noise from AVTrade and Valley Farm Business Park.

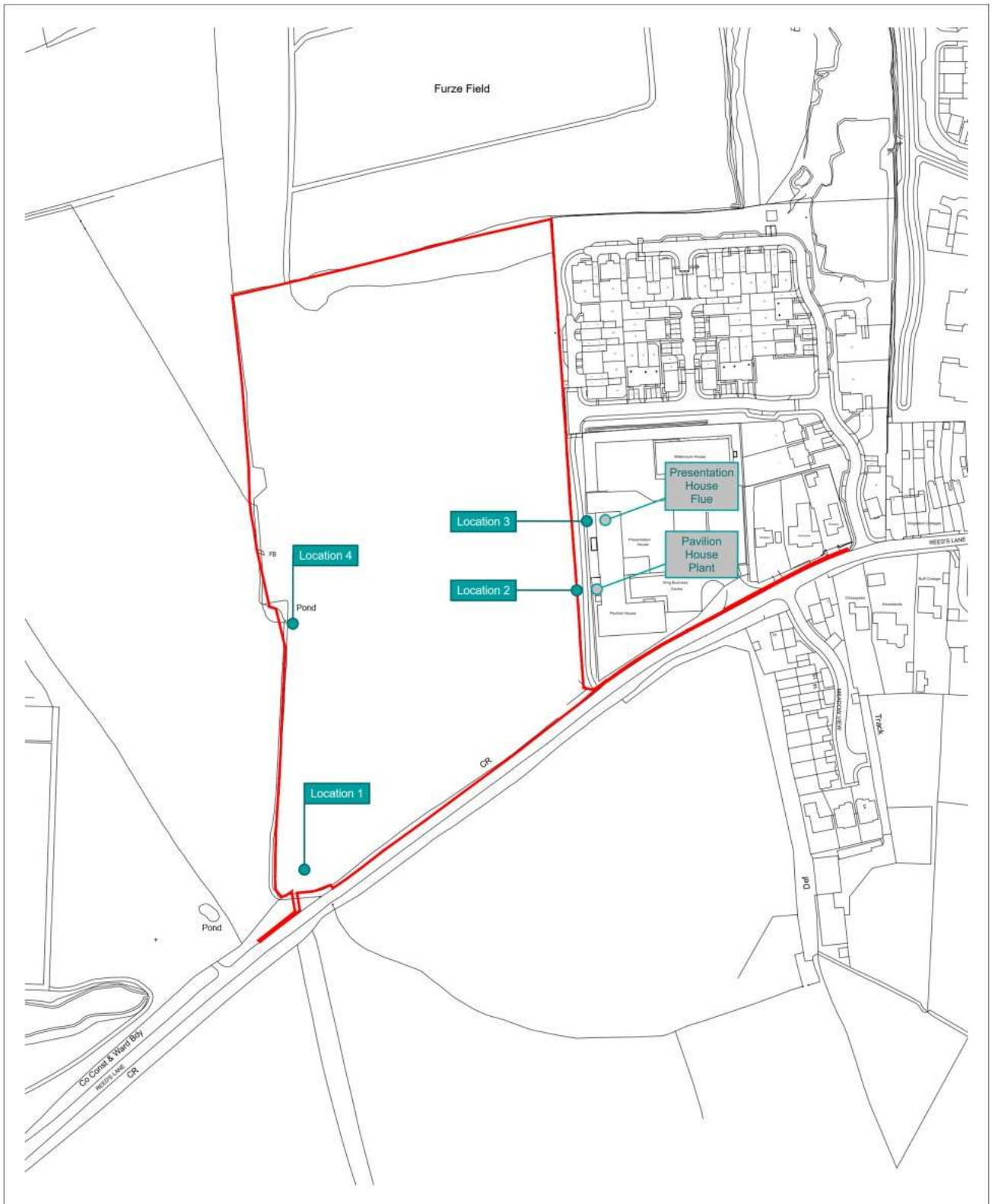
## 5. SUMMARY

5.1 Hepworth Acoustics was commissioned by Reside Holdings Ltd to carry out a noise assessment in connection with a planning application for proposed residential development at a site known as Land west of King Business Centre, Reeds Lane, Sayers Common.

5.2 The application is for the erection of (Use Class C3), including affordable housing units, vehicular, pedestrian and cycle access (including new footpath links to the east and west of the site along Reeds Lane), landscaping and open space, parking, sustainable drainage and other related works.

5.3 A noise survey has been undertaken at the site and the prevailing daytime and night-time noise levels have been determined.

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




Key:

Do not scale from this figure

**Project:** P25-416

**Ref:** **Figure 1**

**Title:** Site Location

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**Key:**

**Do not scale from this figure**

| | |
|---|---|
| **Project:** | P25-415 |
| **Ref:** | **Figure 2** |
| **Title:** | Proposed Development Masterplan |

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# 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.

$L_{A10,T}$ **A-weighted 10 Percentile Level:** The A-weighted sound level exceeded for 10% of a measurement time period ($T$). $L_{A10,T}$ is often used for calculations of road traffic noise, such as in '*Calculation of Road Traffic Noise*' (CRTN) 1988.

$L_{A90,T}$ **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.

$L_{pA}$ **A-weighted Sound Pressure Level:** The Sound Pressure Level ($L_p$) with the frequency spectrum adjusted to account for the average human hearing response at difference frequencies for a moderate sound pressure range.

$D_{n,e,w}$ **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.

$R_w$ **Weighted Sound Reduction Index:** A single figure frequency weighted laboratory sound insulation performance metric of a building element or construction arrangement (e.g. a wall).

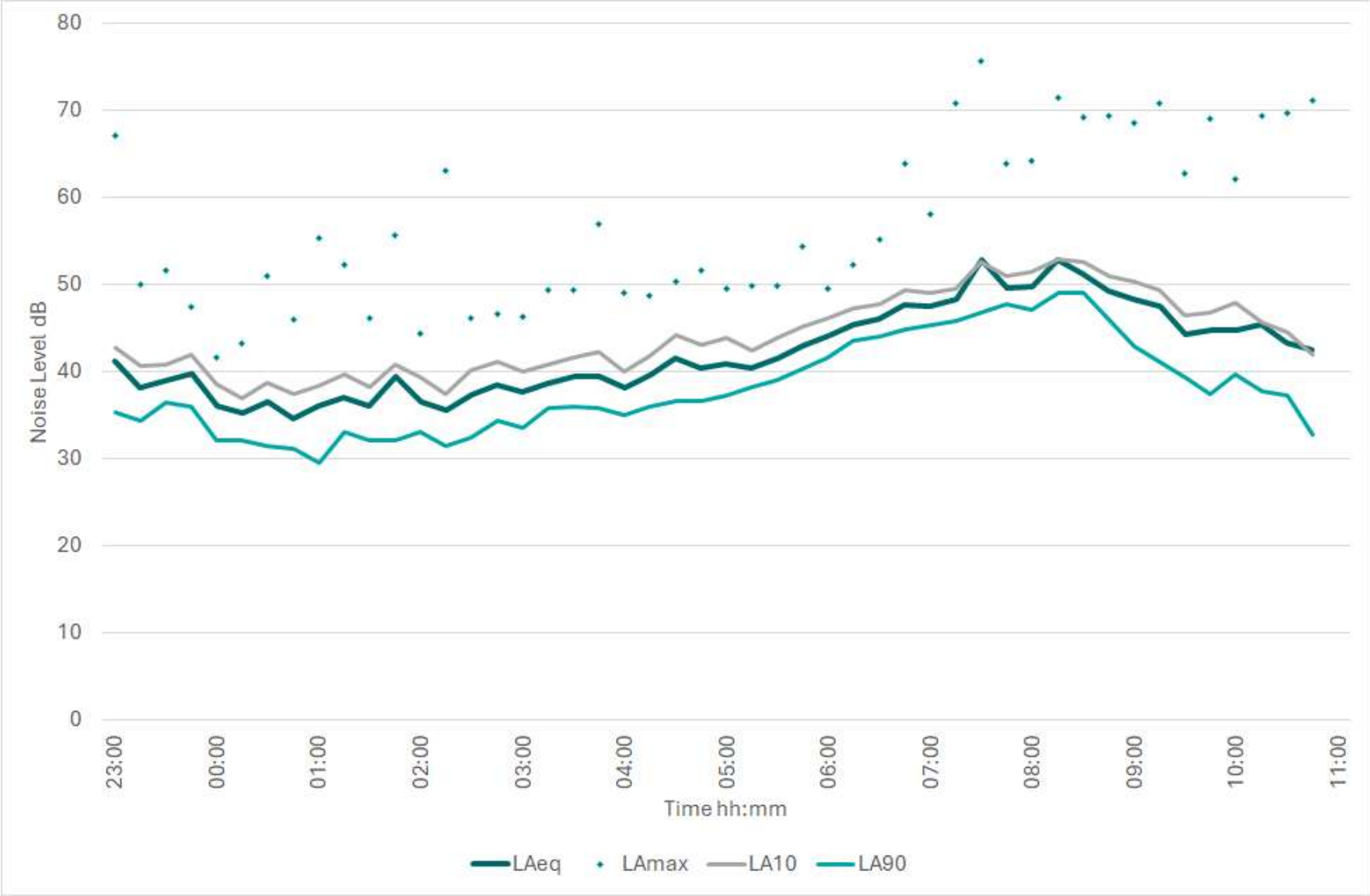
$C_{tr}$ **Transport Noise Spectral Adaptation Term:** A term used with single figure broadband sound insulation metrics (e.g. $R_w$, $D_{n,e,w}$ or $D_{nT,w}$) to account for the spectral composition of typical transport noise sources.

# APPENDIX B: NOISE MONITORING RESULTS

**Location 1**


90
80
70
60
50
40
30
20
10
0
Noise Level dB
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
Time hh:mm
LAeq
LAmax
LA10
LA90

**Location 4**


80
70
60
50
40
30
20
10
0
Noise Level dB
23:00
00:00
01:00
02:00
03:00
04:00
05:00
06:00
07:00
08:00
09:00
10:00
11:00
Time hh:mm
LAeq
LAmax
LA10
LA90