

**PROPOSED DAVID LLOYD HEALTH CLUB
SOUTHPOINT BUSINESS PARK, CHIPPENHAM**

NOISE ASSESSMENT

On behalf of:
David Lloyd Leisure Ltd

PROPOSED DAVID LLOYD HEALTH CLUB SOUTHPOINT BUSINESS PARK, CHIPPENHAM

NOISE ASSESSMENT

Report number	Prepared by	Prepared for
P25-212-R01	Hepworth Acoustics Ltd The Wheelhouse, Bond's Mill Estate Stonehouse, Gloucestershire GL10 3RF southwest@hepworth-acoustics.co.uk 01453 610 354	David Lloyd Leisure Ltd

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Registered in England no. 2387226

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

www.hepworth-acoustics.co.uk

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1. INTRODUCTION

1.1 Hepworth Acoustics was commissioned by David Lloyd Leisure Ltd to carry out a noise assessment in relation to a planning application for a proposed new David Lloyd health club at Plot 100, Southpoint Business Centre, Chippenham.

1.2 The site forms part of a consented employment area, as per application reference N/13/00308/OUT.

1.3 Plot 100 is currently an open field, bounded as follows:

- To the southwest by the A350 West Cepen Way, which is a major trunk road and subject of an ongoing dualling project at the time of this assessment;
- To the northwest by a mainline railway on a substantial embankment (with bridge crossing over A350), with a residential area to the opposite side;
- To the southeast by the newly formed spine road through Southpoint Business Centre (Showell Avenue), to the opposite side of which a substantial new employment site for Siemens is in advanced stage of construction at the time of this assessment.
- To the northeast by Plot 200 at Southpoint Business Centre, available for sale at the time of this assessment, with a new care home also at an advanced stage of construction at the time of this assessment, immediately beyond.

1.4 The site location is shown in Figure 1.

1.5 The health club proposals include for the following, as per the proposed site layout plan shown in Figure 2:

- Three Padel courts with small associated social area
- Battle Box training area
- Outdoor terrace area, including small kids' play area and servery
- Multi Use Games Area
- 8m x 25m Outdoor Pool with Kids Pool and terrace
- Spa Garden
- Three Tennis courts within a dome enclosure

1.6 Internally, the main club building will typically feature the following areas:

- Main reception, including a lounge area, with small café kitchen and servery
- Changing rooms
- Indoor pool area
- Spa area leading to the external spa
- Class / exercise studios
- Large open gym area
- Internal and External plant areas

- 1.7 The proposed ground and first floor layouts are shown in Figures 3 and 4 respectively.
- 1.8 The proposed hours of use of the health club are Monday to Saturday: 06:00 – 23:00 and Sunday / Bank Holiday: 07:00 – 22:00.
- 1.9 It is noted that the outline planning decision notice for the wider new employment area (N/13/00308/OUT) includes the following condition relating to noise:

Condition 8: All fixed plant and machinery shall be so sited and designed in order to achieve a rating level of -5dB below [taken as 5dB below] the lowest measured background noise level, determined at each of the nearest noise sensitive receptors i.e. Holywell Guest House, Showell Cottages and Showell Farm.

- 1.10 The noise sensitive receptors noted in Condition 8 relate to pre-existing residences on the B4528, which bounds the wider new employment area to the east and northeast. However, Condition 8 relates to the plant and machinery noise impacts of the employment area as a whole (i.e. the cumulative noise from all plots). Given that pre-existing residences towards the east of the proposed health club site at Plot 100 will be substantially screened by the intervening Siemens building, and future buildings of other plots that are under offer at the time of this assessment, it is considered that the aforementioned new care home is the potentially most exposed noise sensitive receptor in respect of the proposed health club. Separately to this, the nearest residences are those to the opposite side of the railway line, however these will be very well protected by the intervening embankment, which is approximately 10m in height.
- 1.11 It is also understood that pre-application advice has been sought from Wiltshire Council and that the following comment was provided in relation to noise:

I think it will also be important to understand the noise implications of the development, albeit I acknowledge that this is a site designated for employment uses. It does occur to me that this is a site where the impacts of noise to the site is something to be addressed as well. There are neighbouring noise generating activities including the A350 ... elevated railway tracks and the adjacent traditional employment uses. It needs to be clear in the assessment that this has been considered and will not impact on the operation of the relaxing spa and leisure facilities; or at least will be mitigated through appropriate measures. These details will need to form part of the planning submission along with a proportionate noise assessment.

- 1.12 In view of the above, although any impact of the baseline noise environment upon the proposed leisure use would not normally be considered a material planning matter (rather more a commercial risk element for the applicant), some consideration of this is provided within the assessment.

1.13 The noise assessment has included:

- An inspection of the development site and environs;
- Measurement of the prevailing noise climate of the area;
- Assessment of the potential noise impact of the development on nearby residents;
- Comments relating to potential ambient noise levels in proposed relaxation areas;
- Recommendation of appropriate noise design limits for mechanical services plant and initial comments on noise control measures.

1.14 The various noise indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2. BASELINE NOISE MONITORING

- 2.1 A survey of prevailing baseline noise levels has been carried out at two locations, both identified in Figure 1, over a single 24-hour period commencing at 1700hrs on Tuesday 3 February 2026.

Location 1

- 2.2 Location 1 was towards the east side of Plot 200, hence to the northeast of Plot 100, and was adopted as a representative location in terms of baseline noise at the nearest existing and future residences to both sides of the railway line. This location was found to be suitably remote from live construction sites such that daytime construction noise was not a significant contributor to the overall noise levels at Location 1.
- 2.3 The results from Location 1 are summarised in Table 1. This has been based on individual day (0700-1900hrs), evening (1900-2300hrs) and the applicable night-time period, i.e. the early morning period of 0600-0700hrs.

Table 1: Summary of Baseline Noise Level Survey at Location 1

Noise Level Index		Day 0700-1900hrs	Evening 1900-2300hrs	Final Hour Night 0600-0700hrs
dB L_{Aeq} (residual / ambient)	Range	47-60	38-56	51-53
	Log. average	54	49	52
dB L_{A90} (background)	Range	42-54	35-42	47-49
	Mean	50	38	47
	Mode	52	38	47

Location 2

- 2.4 Further to above, Location 2 was adopted as a representative location in terms of baseline noise at the location of the proposed spa garden, which is considered to be the most noise sensitive of the proposed uses. Location 2 was about 40m back from the nearside edge of the A350, and about 50m laterally from the nearest elevated railway track.
- 2.5 For the purposes of assessment of worst-case noise affecting the proposed use, it is considered suitable robust to consider the day (0700-1900hrs) period only, in terms only of the ambient dB L_{Aeq} noise levels, as set out in Table 2

Table 2: Summary of Baseline Noise Level Survey at Location 1

Noise Level Index		Day 0700-1900hrs
dB L_{Aeq} (residual / ambient)	Range	54-62
	Log. average	59

Survey Details

- 2.6 The noise monitoring was carried out at Location 1 using NTi Audio XL3 'Class 1' sound analyser (serial no. A3A-01459-F0) and at Location 2 using as a NTi Audio XL2-TA 'Class 1' sound analyser (serial no. A2A-23512-E1). Calibration checks were carried out to all equipment using a Norsonic Acoustic Calibrator, Type 1251 (serial no. 20804) before and after the survey, and no variation in calibration level was observed.
- 2.7 The measurement microphone was fitted with a windshield and mounted at 1.4 metres above local ground height and in free-field conditions at both locations.
- 2.8 The weather during the survey was dry and clear with generally light winds of speeds typically not exceeding 3 m/s from a south-westerly direction.
- 2.9 The main source of noise during the survey was road traffic noise, primarily on the A350, and occasional rail noise. With regard to A350 road traffic noise, with regard to the ongoing dualling project, it is noted that no roadworks were taking place in the vicinity of the site during the survey. The available road width was restricted by temporary hoarding for an extended stretch of the road, however it was clear during all periods of attendance that this was not impeding the flow of traffic past the site in either direction.

3. NOISE CRITERIA

National Policy

- 3.1 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 ...”*.
- 3.2 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 ...”*.
- 3.3 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 4142: 2014

- 3.4 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 and/or commercial nature.
- 3.5 BS 4142 requires the ‘rating’ noise level for the operation to be compared with the L_{A90} background noise level in the absence of the operational noise. The ‘rating’ level is derived based on the ‘specific’ L_{Aeq} noise level attributable to the operation with an ‘acoustic feature’ penalty added for any noise sources which give rise to tonal, impulsive, intermittent, or other characteristics readily distinctive against the residual acoustic environment.

- 3.6 With regard to the background noise level, BS 4142 states that *“it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.”*
- 3.7 BS 4142 stipulates that impacts should be assessed over a reference time interval of 1-hour during the daytime (07:00-23:00) and 15-minutes during the night-time (23:00-07:00).
- 3.8 An initial estimate of the impact of the operation is determined by subtracting the background level from the ‘rating’ level. BS 4142 states that:
- Typically, the greater this difference, the greater the magnitude of the impact
 - A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context
 - A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context
 - The lower the ‘rating’ level is relative to the measured background level, the less likely it is that the operation will have an adverse impact or a significant adverse impact. Where the ‘rating’ level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
- 3.9 Where the initial estimate of the impact needs to be modified due to the context, BS 4142 states that all pertinent factors should be taken into account in determining whether the initial estimate of the impact needs to be modified, including:
- The absolute level of sound, including *“where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds background”*
 - The character and level of the residual sound
 - The sensitivity of the receptor and whether dwellings ... will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as: i) façade insulation treatment, ii) ventilation and/or cooling, and iii) acoustic screening
- 3.10 To note, the Scope of BS 4142 sets out at Clause 1.3 that: *“The standard is not intended to be applied to the rating and assessment of sound from: a) recreational activities ... ; b) music and other entertainment; ... f) people; g) public address systems for speech ...”*
- 3.11 As such, the provisions of the Standard are directly applicable to fixed plant associated with the David Lloyd club, that being of a distinctly commercial/industrial character, whereas the provisions are not directly applicable in the case of noise from leisure/recreation activities proposed at the site.

- 3.12 Furthermore, notwithstanding the provisions of BS 4142, it is noted that Condition 8 of application N/13/00308/OUT requires that the fixed plant and machinery noise rating level for the wider development areas must be “*5dB below the lowest measured background noise level*”, as determined at specified receptors. It is noted that the specified rating level limit relative to background noise is 5dB more onerous than that provided for in BS 4142, although it is also noted that this is consistent with preferred guideline set out in the Wilshire Council document *Planning Consultation Guidance Note: Noise and Vibration*. The requirement for this to be based on the ‘lowest’ background noise level is contrary the provisions of both BS 4142 and the Wilshire guidance, which refers to a typical or representative background level.

British Standard 8233: 2014

- 3.13 British Standard 8233: 2014 *Guidance on sound insulation and noise reduction for buildings*, which carries the full weight of an adopted British Standard recommends guidance on design criteria for acceptable noise levels within residential accommodation.
- 3.14 BS 8233 guidelines for the daytime (07:00-23:00) and night-time (23:00-07:00) periods are summarised in Table 4.

Table 4: BS 8233 Recommended Acoustic Criteria for Dwellings

Activity	Location	Internal Noise Levels	
		Daytime (07:00-23:00)	Night-time 23:00-07:00
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 $L_{Aeq,8hr}$

- 3.15 BS 8233 clarifies that the above guidance relates only to noise without specific character (e.g. such as that which has a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content) and that where such characteristics are present, lower noise limits might be appropriate.
- 3.16 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.
- 3.17 Regarding outdoor living areas, BS 8233 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.*”

Recommended Noise Criteria

- 3.18 Accounting for the relevant guidelines set out above, suitable criteria for noise emissions from the proposed development have been considered. Following the relevant guidelines, it is considered that separate criteria should be applied for noise emissions attributable to fixed plant items and those applicable to the proposed leisure activities.
- 3.19 For the proposed plant, noting that a suitable noise level due to fixed plant and machinery, which accords generally with the relevant condition and guidance, should be achieved cumulatively for the wider development, and noting the relevant receptors for noise from Plot 100 are different to those referenced in the outline condition, the following is recommended for a robust approach to this assessment: Fixed plant and machinery noise attributable to the proposed health club to not exceed a rating level of 10dB below the prevailing background noise level at the new care home to the northeast and the nearest existing residences to the northwest. The use of a target 10dB, rather than 5dB, below the background noise allows for contributions at the relevant receptors from other areas of the wider new employment development.
- 3.20 To ensure a robust approach, it is recommended that this should be based on the lower of the modal and arithmetic average values of $L_{A90,15min}$ for any specific period of interest.
- 3.21 It must be noted that for any noise emissions that give rise to intermittent, tonal or impulsive characteristics that are experienced at residential locations, the L_{Aeq} noise limits specifically attributable to the noise source(s) must be reduced commensurately to account for the 'acoustic feature' penalty, in line with BS 4142.
- 3.22 For the proposed leisure activities, in this case, and to ensure a particularly robust assessment, following the guidelines set out in the Wilshire Council document *Planning Consultation Guidance Note: Noise and Vibration*, it is recommended that cumulatively generated noise levels based on full use of the facilities should be controlled to a level that does not exceed the pre-existing typical background noise level at the new care home to the northeast and the nearest existing residences to the northwest, for any specific period of interest
- 3.23 Considering the baseline noise levels at Location 1, as set out in Table 1, it is clear that the most sensitive period of operation (i.e. that with the lowest prevailing baseline noise levels) will be the evening, and hence the adopted approach is to determine applicable noise limits based on that period.
- 3.24 Based on this, the applicable noise limits for the development are as set out in Table 5.

Table 5: Recommended Noise Limits at Nearby Residences

Period	Noise Index	Noise Limit
Leisure Activity Noise	Noise Level, dB $L_{Aeq,T}$	38
Fixed Plant Noise Emissions	'Rating' Level, dB $L_{A,r,Tr}$	28

3.25 Finally, although it is not considered to be a material planning issue, to address the pre-application comments regarding potential for baseline noise to “*impact on the operation of the relaxing spa and leisure facilities*” and more generally to advise the applicant in this regard, it is recommended that noise levels should, as an aspiration, not exceed an upper guideline value of 55dB $L_{Aeq,T}$. This is based on the provisions of BS 8233 and observes that there will be degrees of noise generation across the development itself in any case, that will offset any potential implications of noise from beyond the site boundary.

4. REFERENCE NOISE MEASUREMENTS

- 4.1 Hepworth Acoustics visited an existing and comparable David Lloyd club in Westbury-on-Trym, Bristol on 15 December 2024. The purpose of the visit was to obtain reference noise measurements for the various activities proposed as part of the proposed new development.
- 4.2 Sample noise level measurements were undertaken at a number of locations around the club using a NTi Audio XL2-TA 'Class 1' sound analyser, (serial no. A2A-23512-E1), field calibrated using a Norsonic Acoustic Calibrator, Type 1251 (serial no. 20804) before and after use, with no variation in calibration level observed.
- 4.3 Although most of the proposed activities were covered on this 'brand-specific' reference noise level survey, some activities were not present at the Bristol site. In some cases, therefore, we have supplemented the data set using library data for representative activity that we have previously measured at other premises.
- 4.4 Also, in some cases lower intensity of use was noted at the Bristol site than may be expected at the proposed development at 'worst-case' times, based on the provisions shown on the plans (e.g. although the outdoor pool in Bristol was in use, this was only by a small number of people, due to the time of year, compared to numbers that may be expected in the summer).
- 4.5 In other cases, e.g. the outdoor terrace, where the main noise source will be people's voices, we have generated reference data based on a prediction of overall noise levels from an estimated number of conversations taking place simultaneously (with normal vocal effort), based on the number/size of tables/chairs proposed.
- 4.6 Due to the social mechanics of conversation, it would not be the case that all customers speak at the same time. Research suggests that typically 1 in 2 people at a table would be talking (Rindel, J.H., 2012. *Acoustical capacity as a means of noise control in eating establishments – BNAM2012*). The indicative plans indicate a number of tables in the outdoor area, mostly for 4-persons or more, with a total capacity in the region of 250. Therefore, for the purposes of this assessment we have assumed a total of 125 conversions ongoing at any one time. Calculations have been based on a voice noise level of 64dB L_{Aeq} (Harris, 1991. *Handbook of Acoustical Measurements and Noise Control*), cited in the Wilshire Council document *Planning Consultation Guidance Note: Noise and Vibration*
- 4.7 For the proposed 'Battle Box' exercise facility, we have assumed the worst-case noise may be due to a single person's voice, with 'raised' vocal effort from a single user or instructor. A reference noise level that is 10dB above that used for a normal speaking voice has been assumed, i.e. 74dB L_{Aeq} and it has been taken that this noise will be present for 50% of the time.
- 4.8 The reference activity noise level data used in this assessment are summarised in Tables 2 and 3 for outdoor and indoor locations.

Table 2: Outdoor Reference Leisure Activity Noise Levels

Activity/ Area	Reference / Quantity	Reference Distance / Conditions	Octave Band Centre Frequency, Hz (dB L_{Aeq})								
			63	125	250	500	1k	2k	4k	8k	A
Padel	Single Court	12m from Centre of Court	59	56	57	55	55	50	45	40	59
Tennis	Single Court	12m from Centre of Court	61	55	51	51	50	44	39	31	54
Pool	12 people	7m from Centre of Pool	70	63	61	62	62	60	56	51	67
Multiuse Pitch	Single Pitch	30m from Centre of Pitch	52	48	49	50	49	47	44	37	54
Terrace	125 speakers	1m from reference	75	77	82	85	80	72	67	62	85
Battle Box	1 user	1m from reference	61	63	68	71	66	58	53	48	71

Table 3: Indoor Reference Leisure Activity Noise Levels

Activity/ Area	Reference / Quantity	Reference Distance / Conditions	Octave Band Centre Frequency, Hz (dB L_{Aeq})								
			63	125	250	500	1k	2k	4k	8k	A
Sports Hall	Tennis Courts	Reverberant	55	55	56	58	57	51	47	39	60
Pool	Busy	Reverberant	61	59	61	67	66	64	60	53	71
Gym	Busy	Reverberant	67	64	67	64	64	63	60	53	69
Class Studio	Sound System	Reverberant	83	80	82	85	81	75	70	68	85

5. NOISE IMPACT ASSESSMENT

Leisure Facilities Noise Impact

- 5.1 Considering potential noise impacts at the nearest residences, predictions of overall outdoor leisure activity noise levels have been carried out assuming full usage of all external areas, based on proposed separation distances, and the reference noise levels set out in Table 2.
- 5.2 Initial calculations have been undertaken in the absence of any mitigation measures and only include corrections for attenuation of sound over distance and acoustic screening corrections where applicable.
- 5.3 For the new care home to the northeast, minimal acoustic screening corrections have been cautiously applied with regard to noise from outdoor areas, only to the following:
- For the outdoor pool, for which a set of corrections conferring an overall 10dBA reduction have been applied, as this area will be centrally located to the opposite side of the health club building
 - For the westernmost padel court, for which a set of corrections conferring an overall 5dBA reduction have been applied, as this area will be to the opposite side of the health club building, more to the eastern fringe
 - For the terrace: This area has been subdivided into three equal sections, and a set of corrections conferring overall reductions of 10dBA, of 5dB and of zero have been applied respectively, reflective of proposals for this area to be mostly but not entirely protected behind the health club building
- 5.4 For the existing residences to the northwest, a set of acoustic screening corrections conferring an overall 17dBA reduction have been applied, accounting for the very substantial intervening railway embankment. This has been calculated based on a source height of 2m, a receiver height at the residences of 4.5m to represent first floor, and a distance from source to barrier of 150m to represent the worst-case scenario.
- 5.5 The assessment assumes that all the three padel courts and three tennis courts are in use simultaneously. It has also been assumed for a worst-case assessment that the tennis dome material provides zero sound reduction.
- 5.6 The predicted noise levels from outdoor leisure activity at the new care home to the northeast are shown in Table 6 and predicted noise levels from outdoor leisure activity at the nearest existing residences to the northwest are shown in Table 7.

Table 6: Predicted Outdoor Leisure Activity Noise Levels at New Care Home to Northeast

Activity / Area	Assessment Distance	Predicted Noise Level, dB L_{Aeq}								
		Octave Band Centre Frequency, Hz								A
		63	125	250	500	1k	2k	4k	8k	
Padel Court 1	350	24	22	23	20	21	15	11	5	24
Padel Court 2	350	29	27	28	25	26	20	16	10	29
Padel Court 3	350	29	27	28	25	26	20	16	10	29
Battle Box	340	10	12	17	20	15	7	2	-3	20
Multiuse Pitch	310	33	30	31	29	29	24	20	14	33
Outdoor Pool	310	22	24	28	31	26	18	13	8	31
Terrace	310	30	21	18	19	17	15	10	3	22
Tennis Court 1	220	35	29	25	26	24	18	13	6	27
Tennis Court 2	220	35	29	25	26	24	18	13	6	27
Tennis Court 3	220	35	29	25	26	24	18	13	6	27
TOTAL		42	37	37	36	35	29	25	19	38

Table 7: Predicted Outdoor Leisure Activity Noise Levels at Nearest Residences to Northwest

Activity / Area	Assessment Distance	Predicted Noise Level, dB L_{Aeq}								
		Octave Band Centre Frequency, Hz								A
		63	125	250	500	1k	2k	4k	8k	
Padel Court 1	160	28	24	23	17	15	6	-1	-10	20
Padel Court 2	170	28	23	22	17	14	6	-2	-10	19
Padel Court 3	180	27	23	22	16	14	5	-2	-11	19
Battle Box	180	8	8	11	11	3	-8	-16	-24	10
Multiuse Pitch	180	29	22	21	19	16	11	4	-6	21
Outdoor Pool	140	24	24	27	27	19	8	0	-8	26
Terrace	120	38	28	24	23	19	15	8	-1	25
Tennis Court 1	140	32	24	18	15	10	2	-6	-17	17
Tennis Court 2	155	31	23	17	14	9	1	-7	-18	16
Tennis Court 3	170	30	22	16	13	9	0	-8	-19	15
TOTAL		41	34	32	30	25	18	11	2	31

- 5.7 As can be seen from Tables 6 and 7, the predicted outdoor leisure activity noise levels are within the recommended noise limits at nearby residences, based on worst-case calculations of all outdoor facilities being in use concurrently, and on an assessment focussed on the more sensitive evening period
- 5.8 At the nearest existing residences to the northwest, even on this basis, the predicted outdoor leisure activity noise level is significant below the typical existing background noise level. This is as expected, primarily due to the very substantial intervening embankment.
- 5.9 At the new care home to the northwest, the predicted noise level is equivalent to the typical background noise level, however it is noted that, firstly, the calculations do not take account of any soft ground absorption, which would be expected to provide a further small reduction in noise based on existing conditions. More pertinently, however, it is to be expected in line with the outline consent for the wider new employment area that the currently vacant intervening site between the proposed health club and the new care home will be developed in the near future for employment use, hence forming a substantial buffer between the two sites.
- 5.10 Further to consideration of outdoor noise, a review of internal activity noise break-out has been carried out.
- 5.11 It is noted firstly that internal levels in most areas are expected to be modest and hence will be readily contained by the building envelope. However, elevated noise levels are expected to be possible in the class studio areas (e.g. for spin class type activities etc.). Therefore, the noise break-out assessment has focussed on these areas.
- 5.12 We understand typically the proposed building fabric for the health club will consist of walls formed of 200 mm thick cladding panels (mineral wool core) with internal plasterboard linings and a roof formed of 300 mm thick Euroclad Elite 4 standing seam roof (mineral wool insulation). It is anticipated therefore that the building envelope will provide an overall sound insulation rating comfortably in excess of 32 dB R_w .
- 5.13 On this basis, even if it were the case that the noisiest internal areas, i.e. the three class / exercise studios were all oriented towards the nearest existing / future residences, then based on the shortest distance separation, and accounting for the acoustic screening effects of the railway embankment towards the northwest, noise break-out levels that are >20dB lower than corresponding outdoor activity noise levels are predicted. Break-out of internal activity noise will therefore not contribute to the overall noise levels attributable to development.
- 5.14 In summary of the foregoing leisure facilities noise impact assessment, it is therefore concluded that predicted activity noise levels will be well within recommended limits, and hence no additional noise mitigation measures are warranted in that regard.

Plant Noise Impact and Mitigation

- 5.15 As is usual at this stage of project development, precise plant selections are not yet confirmed. Nonetheless, plant noise emissions may be readily enforced for planning purposes by way of a suitably worded standing planning condition, citing the recommended fixed plant noise emissions set out in Table 5 of this report.
- 5.16 Noting the recommended levels, and based on our experience of similar schemes, it is anticipated that noise emissions from necessary equipment can be readily and adequately controlled by way of a number of conventional noise control methods.
- 5.17 These include careful orientation of noise sources away from the nearest residences, selection of low-noise equipment, localised acoustic screening and physical noise control apparatus such as acoustic attenuators/louvres and acoustic enclosures.
- 5.18 It is anticipated that such apparatus/mitigation may be required to the external first floor plant area, potentially including solid or louvred acoustic screening of the plant area, as well as noise control measures applied directly to the plant. However, these matters are subject to the finalisation of detailed design and specification of the relevant systems.

Noise Levels at the Proposed Development

- 5.19 As set out, pre-application advice from Wiltshire Council included the following comment in relation to noise:

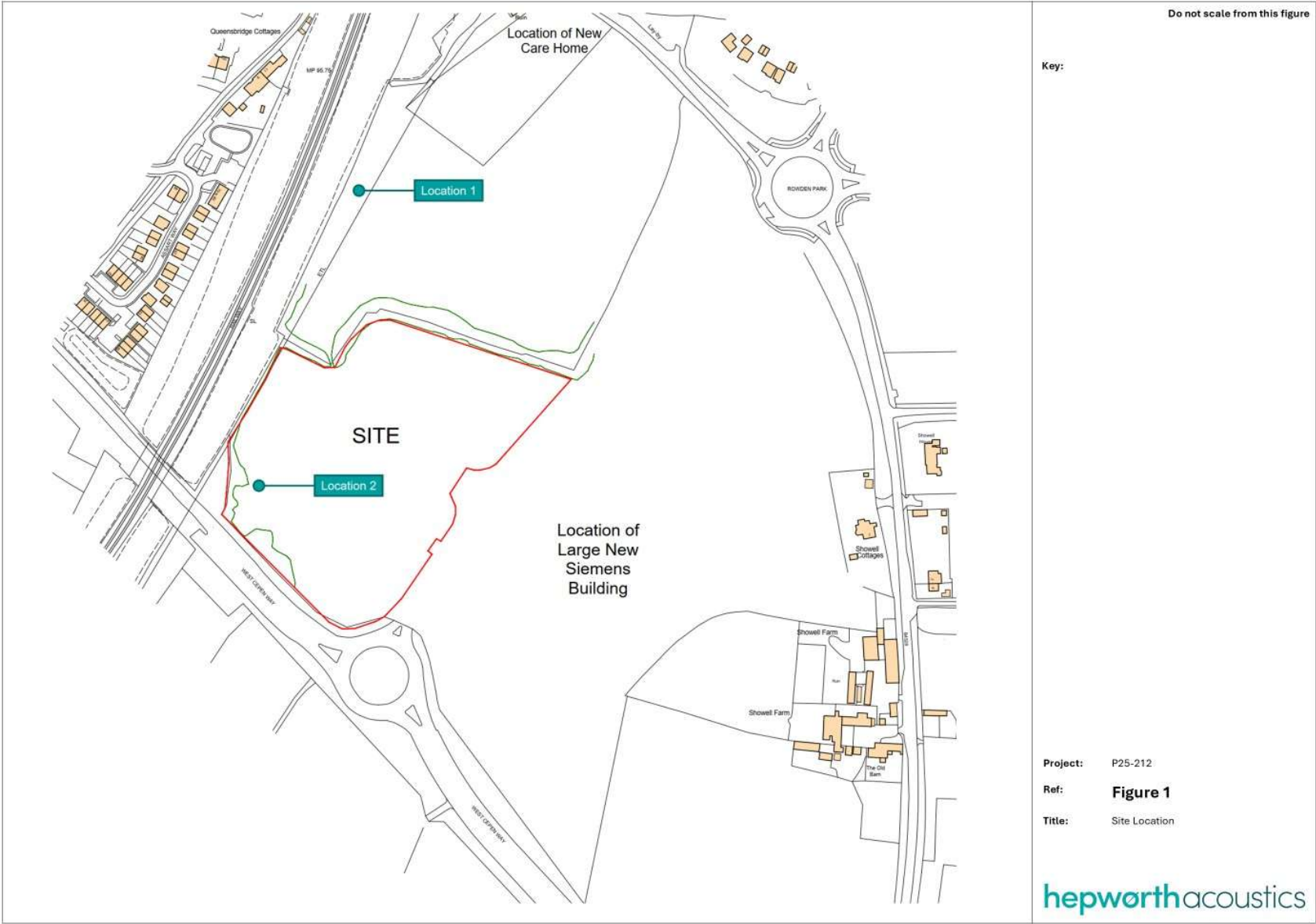
I think it will also be important to understand the noise implications of the development, albeit I acknowledge that this is a site designated for employment uses. It does occur to me that this is a site where the impacts of noise to the site is something to be addressed as well. There are neighbouring noise generating activities including the A350 ... elevated railway tracks and the adjacent traditional employment uses. It needs to be clear in the assessment that this has been considered and will not impact on the operation of the relaxing spa and leisure facilities; or at least will be mitigated through appropriate measures. These details will need to form part of the planning submission along with a proportionate noise assessment.

- 5.20 As we have noted, the impact of the baseline noise environment upon the proposed leisure use would not normally be considered a material planning matter (rather more a commercial risk element for the applicant). Nonetheless, based on the averaged daytime noise levels at Location 2 of 59dB $L_{Aeq,T}$, a 4dB reduction would be suitable to achieve the suggested target of 55dB $L_{Aeq,T}$ in the proposed spa garden.
- 5.21 The dominant noise source in this area of the site is the A350, and a reduction in noise from this source of about 10dBA can be achieved in the spa garden by way of a solid imperforate boundary screen/wall of at least 10kg/m² superficial mass.

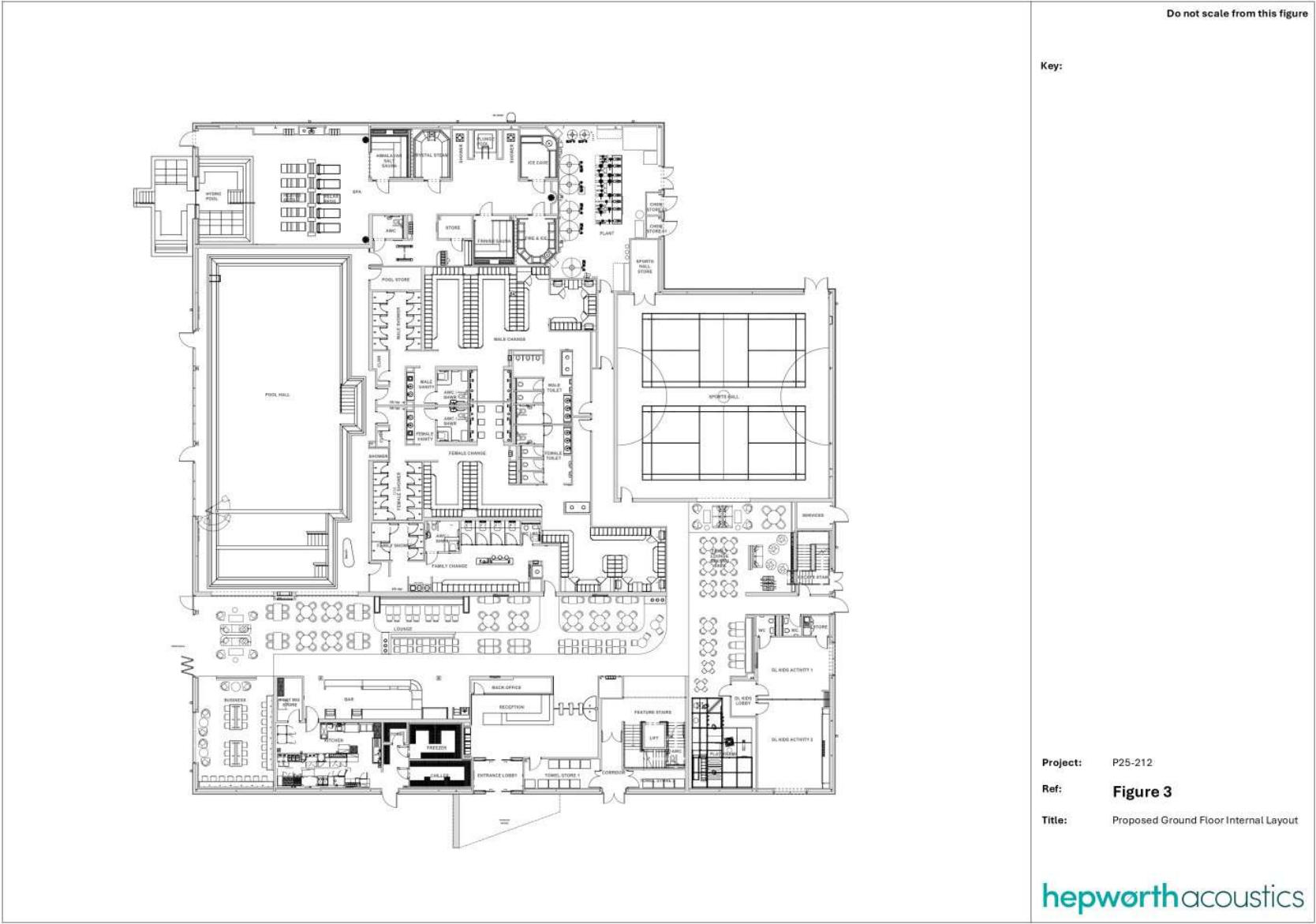
- 5.22 It is recognised that railway noise may also be noticeable at times in the spa garden, however from observations on site this is not of an obtrusive level, partly due to the elevation of the railway line in this area. Of course, for the same reason, this source cannot be very practicably mitigated.
- 5.23 Moreover, it is important to note that, although the spa garden will be a relaxing space, there will be noise generated by users of the space itself, and also from other club facilities in the near vicinity, which will be entirely consistent with the expectations of club users. Therefore, we do not anticipate any problematic issues relating to noise from road and railway sources affecting the proposed development.

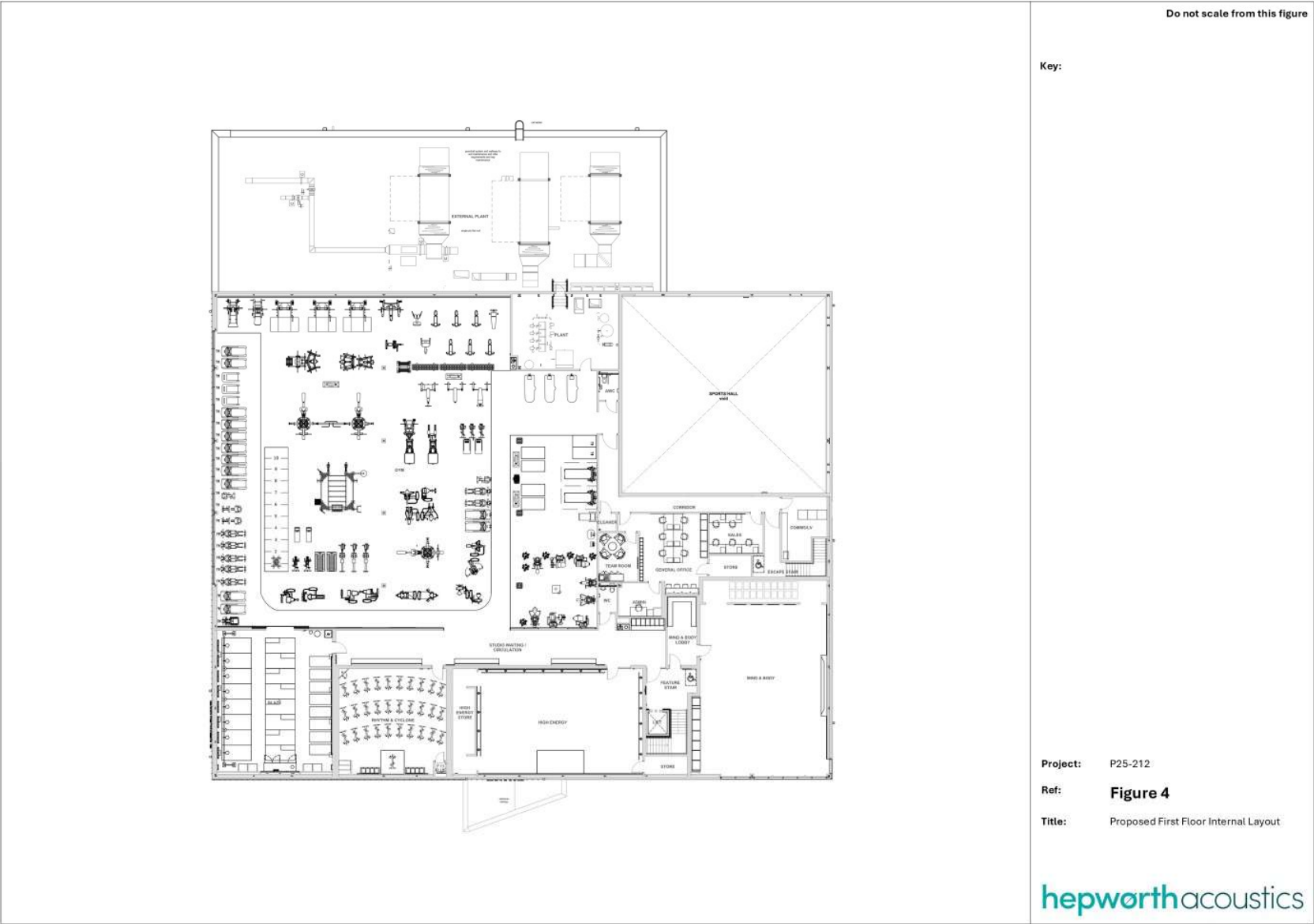
6. SUMMARY

- 6.1 Hepworth Acoustics has undertaken a noise assessment in relation to a planning application for a proposed new David Lloyd health club at Plot 100, Southpoint Business Centre, Chippenham.
- 6.2 A survey of baseline ambient and background noise levels has been carried out at a location representative of the nearest existing and future residences.
- 6.3 Representative reference noise levels for the various activities proposed as part of the proposed new development have been determined by way of measurement of similar at the existing David Lloyd club at Westbury-on-Trym, Bristol, supplemented with in-house library data where appropriate.
- 6.4 Suitable noise criteria have been determined for the development by reference to relevant British Standards and other guidance documentation, and upon the baseline ambient and background noise levels measured at the site.
- 6.5 Noise levels from the proposed leisure activities have been predicted at the nearest dwellings. It has been concluded that predicted activity noise levels will be well within recommended limits, and hence no additional noise mitigation measures are warranted in that regard.
- 6.6 It has been recommended that plant noise emissions may be readily enshrined and enforced for planning purposes by way of a suitably worded standing planning condition. Appropriate mitigation measures to ensure that these are not exceeded have been discussed.
- 6.7 It has been discussed that no problematic issues relating to noise from road and railway sources affecting the proposed development are anticipated.









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.

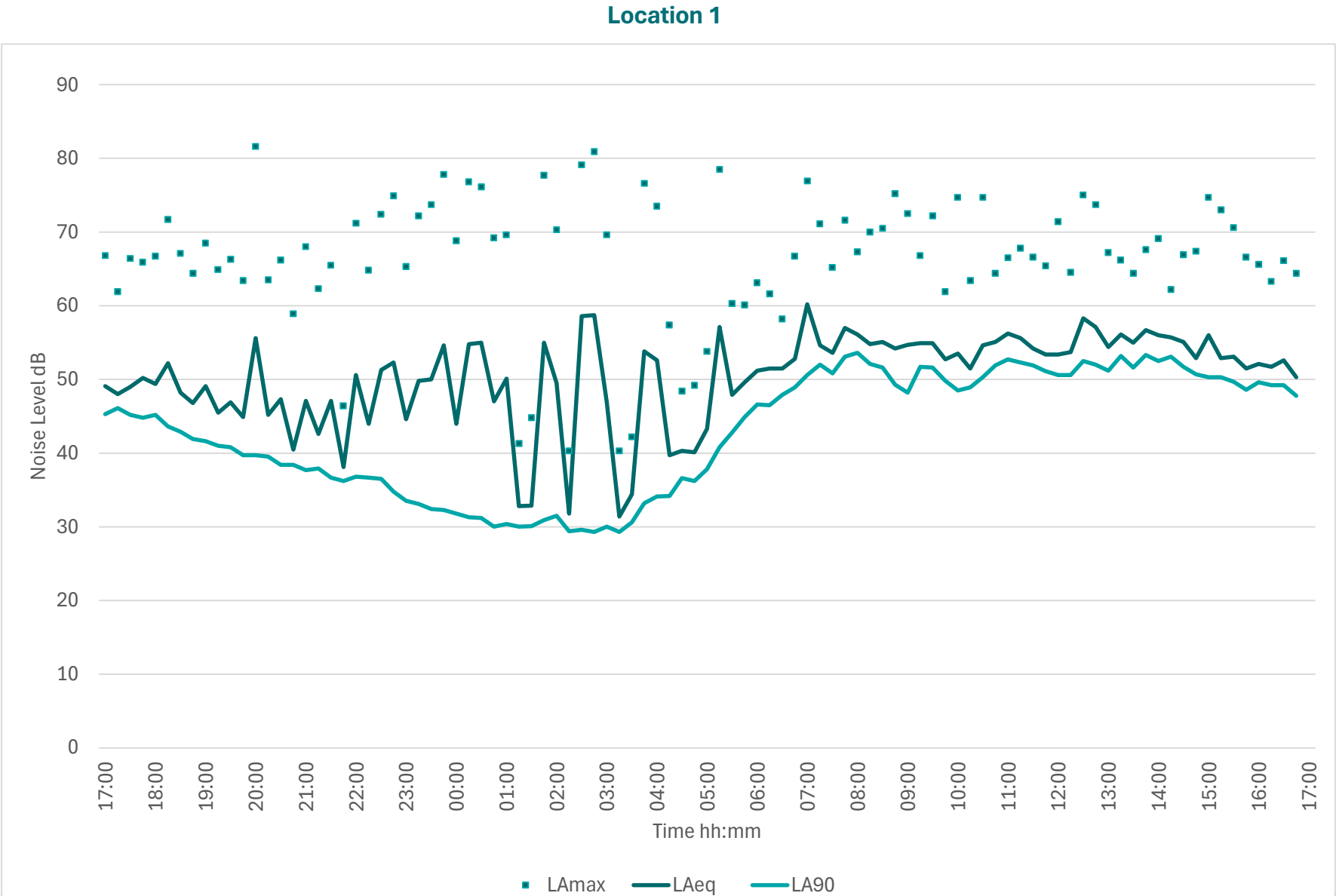
Glossary of Terms

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,T_r}** **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.
- 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).

APPENDIX B: NOISE SURVEY RESULTS



Location 2

