



Fledglings Lodge - Proposed Development

Noise Impact Assessment

Revision 00

24 April 2025

1 Introduction

Harmonia Consulting has been appointed to carry out a noise impact assessment for a proposed development of the Fledglings Lodge nursery at 51 Armour Hill, Tilehurst RG31 6JP. The purpose of the assessment is to evaluate impact of the development on nearby receptors.

2 Executive Summary

A noise survey of the site and acoustic modelling calculations have been performed to compare the existing and proposed noise climates.

We conclude that the noise from the development will have negligible effect on nearby sensitive receptors, and that the noise impact of the proposed development is therefore acceptable.

3 Development overview

The site consists of a single storey nursery building, with a rear garden containing a sheltered garden structure and storage shed. The site is surrounded by a 2.1m high fence. The surrounding area includes houses with gardens. The site is bounded by the garden of a house (49 Armour Hill) to the west, and a public footpath to the east. Another house with garden (55 Armour House) is on the far side of the footpath.

The proposed development includes:

- Construction of a new nursery extension in place of the existing garden structure
- Increase in the maximum number of children at the nursery from 17 to 23

The new building does not present any new noise sources, so this assessment focusses on the increase in noise due to the increased number of children that may be playing in the nursery garden.

3.1 Location & development plans



Figure 1 - Location satellite image (Imagery ©2025 Maxar Technologies, Map data ©2025)

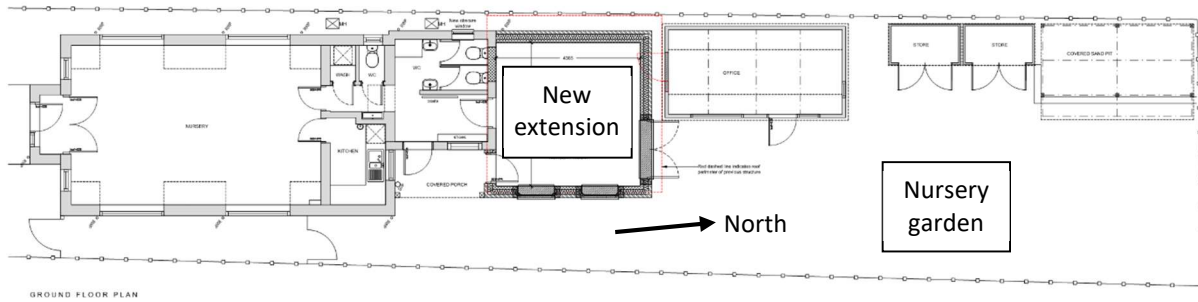


Figure 2 - Plan of the proposed development

3.2 Daily schedule

The current daily schedule will remain unchanged, and this includes the following times when children may play outside:

- 9am to 12pm
- 1:30pm to 4pm
- 4:45pm to 6pm

4 Criteria

This assessment is based on the guidance and principles in the following documents:

- Noise Policy Statement for England (NPSE) 2010
- National Planning Practice Guidance (NPPG) 2019
- BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings*
- World Health Organisation (WHO) 1999 *Guidelines for Community Noise*
- Institute of Environmental Management & Assessment (IEMA) 2014 *Guidelines for Environmental Noise Impact Assessment*

4.1 NPSE

Key aims of the Noise Policy Statement for England can be summarised as:

- Avoid significant adverse impacts
- Mitigate and minimise adverse impacts

The document discusses effect levels using the following terms:

- NOEL – No Observed Effect Level
- LOAEL – Lowest Observed Adverse Effect Level
- SOAEL – Significant Observed Adverse Effect Level

No fixed sound levels are attached to each of these effect levels.

4.2 NPPG

This guidance states that decision making should consider:

- Likelihood of significant adverse effect
- Likelihood of adverse effect
- Whether good standard of amenity can be achieved

The document refers to the NOEL, LOAEL and SOAEL as in NPSE. It advocates a flexible approach to interpretation, taking into account numerous environmental and human behaviour factors.

4.3 WHO

The World Health Organisation (WHO) document *Guidelines for Community Noise* presents these guidelines:

- To avoid moderate annoyance outside dwellings during daytime, noise should not exceed 50 dB $L_{Aeq,T}$
- To avoid high annoyance outside dwellings during daytime, noise should not exceed 55 dB $L_{Aeq,T}$

The L_{Aeq} parameter assesses the average noise over a period.

4.4 BS 8233: 2014

This standard states that it is desirable for external noise levels in gardens not to exceed 50 dB $L_{Aeq,T}$, with an upper limit of 55 dB $L_{Aeq,T}$ suggested.

4.5 IEMA

This document presents an interpretation of the impact of a sound level change, as reproduced in Table 1.

Table 1 - IEMA Table 7-14: Impact from the change in Sound Levels

Long-term Impact Classification	Short-term Impact Classification	Sound level change dB L_{pAeqT} (positive or negative) T = either 16hr day or 8hr night
Negligible	Negligible	≥ 0 dB and < 1 dB
	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3 dB and < 5 dB
Moderate	Major	≥ 5 dB and < 10 dB
Major		≥ 10 dB

We will use the following to relate these descriptors to the NPSE terminology:

- Negligible impact: below NOEL
- Minor impact: above NOEL and below LOAEL
- Moderate impact: above LOAEL and below SOAEL
- Major impact: above SOAEL

4.6 Project criteria

Informed by the cited documents, the following project criteria are adopted for this assessment:

- Noise levels in gardens should be less than 55 dB $L_{Aeq,T}$, and ideally less than 50 dB $L_{Aeq,T}$.
- Change in daytime $L_{Aeq,16hr} < 1$ dB for no observed effect level (NOEL)

5 Noise survey

5.1 Description

The noise survey was carried out by Alistair Meachin MIOA CEng.

Attended short-term measurements were made at the locations indicated in Figure 3. Measurements were made over the period from 8:49am to 11:16am on Monday 14 April 2025.

The Svantek 977A Class 1 sound level meter (serial 92145) used for all measurements was calibrated before and after the session using a Svantek SV33B Class 1 calibrator (serial 93166), with no significant deviations observed.

Weather during the survey was dry and mostly sunny, with temperature approximately 12 degrees Celsius. Wind speeds measured during the survey were typically around 1m/s, with gusts up to 2.3m/s.

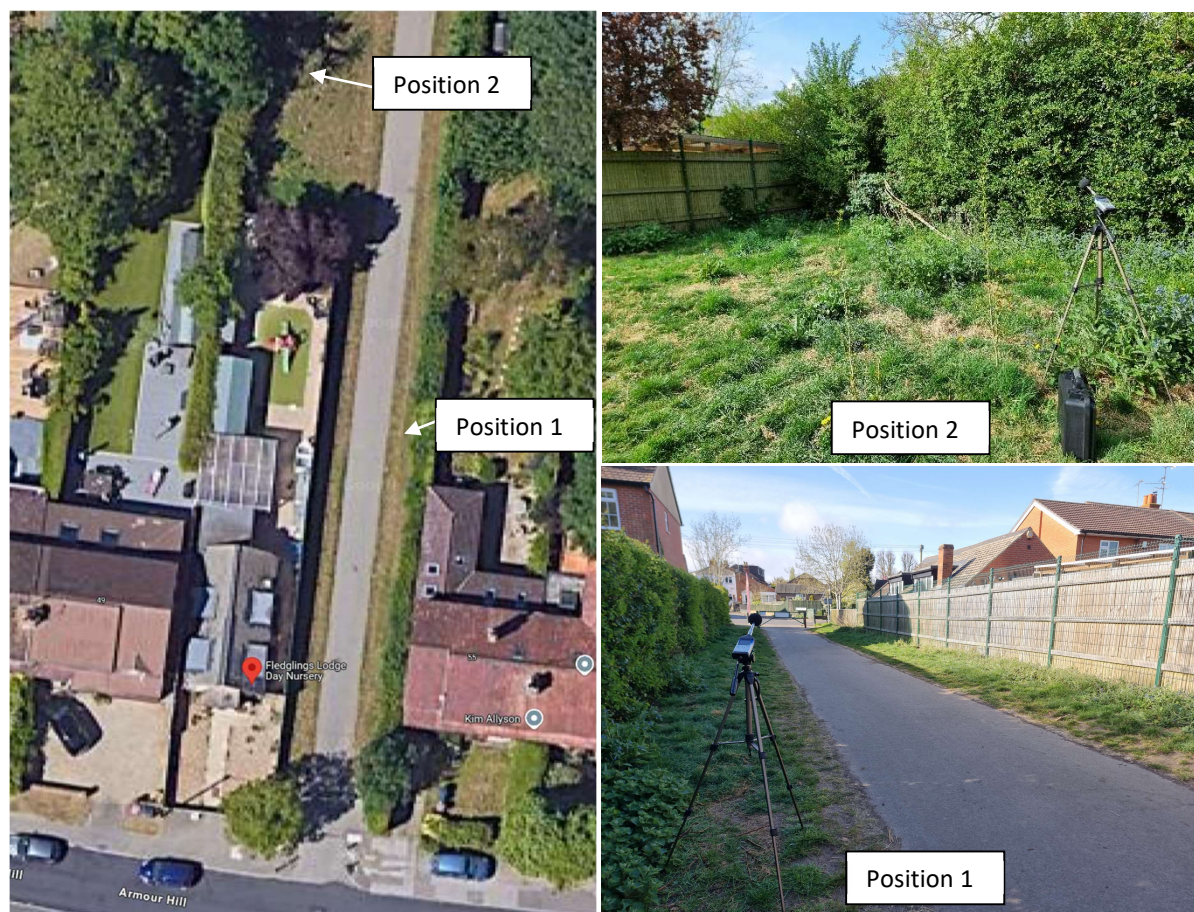


Figure 3 - Noise survey measurement positions

The measurement period included both times when children were playing in the nursery garden and when they were not. However, since the fence prevented visual confirmation and the noise from children was not

sufficiently above background level to unambiguously determine when they were present, it is not possible to definitively label the periods when children were or were not present in the garden.

The nursery manager informed us that 14 children were attending on the day of the survey.

5.2 Results

The following measurements were made:

- Position 1: From 8:49am for 51 minutes
- Position 1: From 9:44am for 31 minutes
- Position 2: From 10:16 for 61 minutes

Values of L_{90} , $L_{Aeq,T}$ and L_{AFmax} were logged at one minute intervals, and these are plotted in Figure 4 and Figure 5.

Observed noise sources during the survey were:

- Distant traffic
- Occasional vehicles passing on Armour Hill
- Birdsong from nearby trees – note that this became the dominant noise source from 11am onwards, corresponding to the increased levels from this time seen in Figure 5
- Voices of adults and children walking along the footpath
- Dogs barking – we note that the adjacent park is a popular destination for dog walkers, many of whom access it via the path adjacent to the nursery
- Occasional distant sirens
- Aircraft

During the measurements, several noise events in close proximity to the sound level meter occurred, including children on the footpath shouting and adults on the footpath speaking loudly. Since these were not representative of the wider area's ambient noise level they were excluded from the overall L_{Aeq} calculation. Accordingly, the arithmetic mean of the $L_{Aeq,1min}$ values excluding close-proximity noise events were assessed as:

- Position 1: $L_{Aeq,T}$ 49.6 dB
- Position 2: $L_{Aeq,T}$ 49.9 dB

The slightly higher level at Position 2 than Position 1 may be attributed to the increased level of bird noise during measurement at Position 2. The Position 1 level is therefore used as the typical ambient noise level in the area in this assessment.

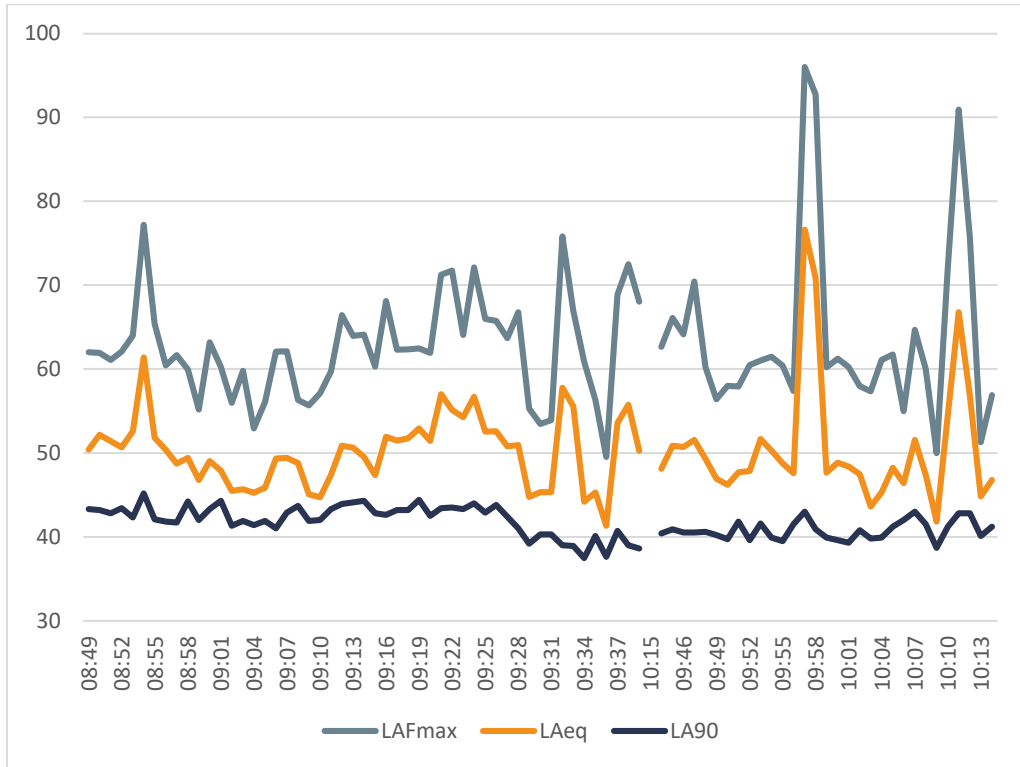


Figure 4 - Position 1 noise level measurements in dB

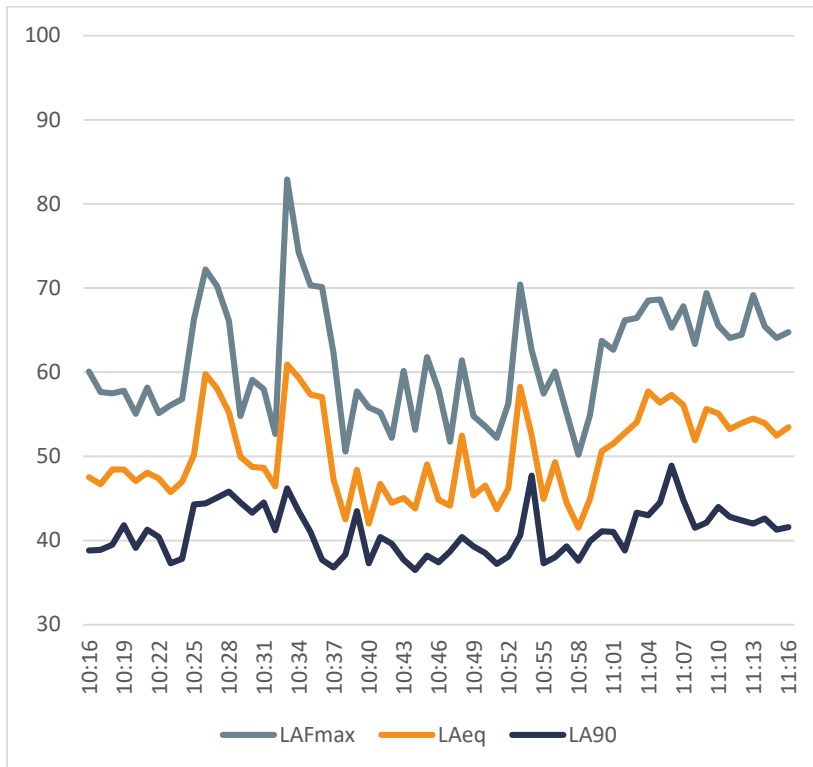


Figure 5 - Position 2 noise level measurements in dB

6 Acoustic modelling

6.1 Description

To assess noise propagation from the development we have created computer models using dbmap software. This is based on the ISO 9613-2:2024 methodology.

Models have been built for both the existing and proposed scenarios.

Since the noise survey did not result in an unambiguous level to be used for the sound of children playing, we have used values measured in public record acoustic reports to determine that the typical noise level at the boundary of a nursery play area is 68dBA. The power of the area source used in the 'existing' model was adjusted match this level.

For the 'proposed' model the source power level was increased according to the proposed increase in child capacity from 17 to 23, calculated as $10 \log (23/17) = 1.3\text{dB}$

The source noise spectrum shape used was based on the ANSI 3.5¹ definition of shouted speech, with human directivity adjustments as described by Rindel².

A-weighted noise has been mapped with 1dB contours at 1.5m above ground level, taking into account typical ground and atmospheric effects as well as building reflections.

6.2 Results

The mapping results of the model for the 'existing' and 'proposed' options are illustrated in Figure 6 and Figure 7.

¹ ANSI 3.5-1997. American National Standard – Methods for Calculation of the Speech Intelligibility Index, (1997)

² J. H. Rindel & A. C. Gade "Dynamic sound source for simulating the Lombard effect in room acoustic modelling software", Intnoise (2012)

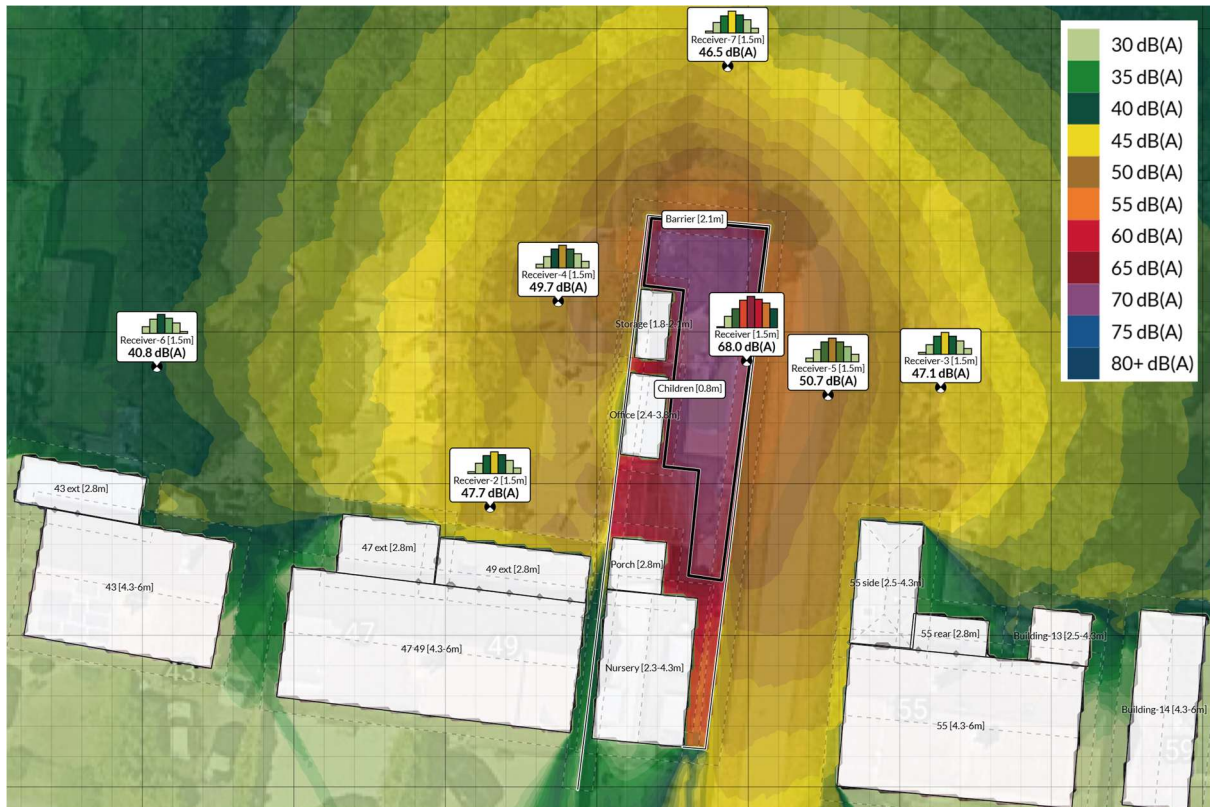


Figure 6 - Acoustic model results for existing configuration

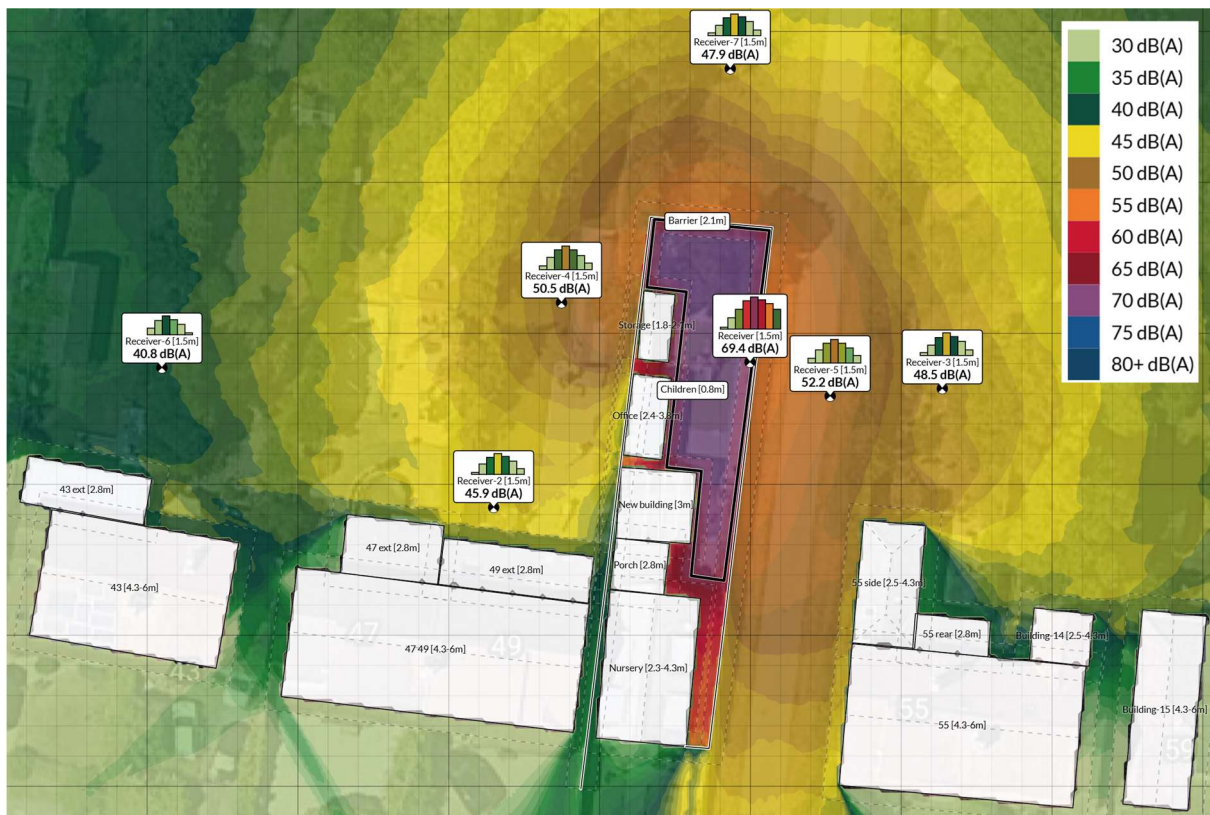


Figure 7 – Acoustic model results for proposed configuration

6.3 Commentary on results

We make the following observations on the calculated modelling results:

- The level calculated at Receiver 5 (equivalent to survey Position 1) for the 'existing' model is 1dB higher than the assessed $L_{Aeq,T}$ value at this position. It is however, below the higher values of $L_{Aeq,1min}$ logged during the survey (shown in Figure 4). This indicates that the modelled source level is a reasonable estimate for the times of day with highest noise from children playing.
- At Receiver 4 (near the back of the garden of 47 Armour Hill) the level is 0.8dB higher in the 'proposed' model than the 'existing' model.
- At Receiver 2 (close to the house in the garden of 47 Armour Hill) the level is reduced by 1.8dB from the 'existing' to the 'proposed model'. This reduction will be due to the increased screening of between the nursery garden and the receiver due to the new extension.
- At Receiver 3 (in the garden of 55 Armour Hill) the level has increased by 1.4dB from the 'existing' to the 'proposed'.
- The noise level within the nursery garden has risen by 1.4dB. This is slightly higher than the 1.3dB increase in source power level due to additional reflections from the new extension.
- The modelled values correspond to times when the nursery garden is at full capacity. To assess impact in line with the $L_{Aeq,16hr}$ recommendation of IEMA the values must be adjusted accordingly to the duration of nursery garden use (see section 7).

7 Assessment of Impact

The calculations below assess the impact of the modelled noise levels in the context of our assessment of existing ambient noise.

The typical daily schedule for nursery garden use given in section 3.2 totals 5.75 hours in a day. To assess nursery garden noise levels in terms of the 16 hour $L_{Aeq,T}$ criterion, the required adjustment is given by:

$$10 \log (5.75 \text{ hr} / 16 \text{ hr}) = -4.4 \text{ dB}$$

The change in $L_{Aeq,16hr}$ and the resulting noise impact classification for four representative positions is calculated as shown in Table 2.

Table 2 - Calculation of impact at representative locations (green cells indicate values that meet criteria)

Location	43 Armour Hill garden	49 Armour Hill garden (close to house)	49 Armour Hill garden (back of garden)	55 Armour Hill garden
Model receiver number	6	2	4	3
Assessed $L_{Aeq,T}$ existing ambient noise level, including existing nursery use	49.6 dB	49.6 dB	49.6 dB	49.6 dB
$L_{Aeq,T}$ due to full capacity nursery garden (existing)	40.8 dB	47.7 dB	49.7 dB	47.1 dB
$L_{Aeq,T}$ due to full capacity nursery garden (proposed)	40.8 dB	45.9 dB	50.5 dB	48.5 dB
$L_{Aeq,16hr}$ due to nursery garden (existing) adjusted for hours of use	36.4 dB	43.3 dB	45.3 dB	42.7 dB
$L_{Aeq,16hr}$ due to full capacity nursery garden (proposed), adjusted for hours of use	36.4 dB	41.5 dB	46.1 dB	44.1 dB
$L_{Aeq,16hr}$ calculated ambient noise level, including proposed nursery use	49.6 dB	49.2 dB	49.9 dB	49.9 dB
Noise effect (change in $L_{Aeq,16hr}$)	0.0 dB	-0.4 dB	0.3 dB	0.3 dB
IEMA impact classification	Negligible	Negligible	Negligible	Negligible

At the locations assessed the change in $L_{Aeq,16hr}$ is calculated to be less than 1 dB, so is classified as negligible according to IEMA and below the threshold of 'No Adverse Effect Level'.

The absolute level of $L_{Aeq,16hr}$ will remain below the proposed 'ideal' criterion of 50 dBA, indicating that the proposed development will not result in unacceptable outdoor conditions.

8 Limitations

Harmonia Consulting Limited has prepared this assessment exercising reasonable care and attention. We accept no responsibility outside the scope of our agreement with the client and no legal liability arising from the use of this document or data or opinions within it beyond its stated purpose.

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