

Acoustic Consultancy Report

External Activity Assessment

LCP Project Number 38535

LCP Project Name Wigwam Day Nursery

Report Prepared For

Park Day Nursery Limited

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i) Executive Summary

Wigwam Day Nursery, 22 Fatherson Road in Reading is proposing to increase the pupil size from 37 to 50 children.

LCP has been commissioned to carry out an acoustic environment survey and to use the obtained data to assess the potential noise impact of the increased pupil activity on surrounding noise sensitive receptors.

Calculations have been carried out to determine the noise levels at the nearest receiver premises. The calculations show that there will be an indication of low impact.

1. Introduction

Wigwam Day Nursery, 22 Fatherson Road in Reading is proposing to increase the pupil size from 37 to 50 children.

LCP has been commissioned to carry out an acoustic environment survey and to use the obtained data to assess the potential noise impact of the increase pupil activity on surrounding noise sensitive receptors.

The report details recommendations for necessary noise mitigation where necessary.

The guidance contained in this report is given on the basis that the existing nursery opening hours are between 07:30 and 18:00hrs.

2. Survey

2.1. Site Description

The site layout together with the measurement position is shown in the drawing contained within Appendix A. There is to be no change with the existing boundary fence at the site.

2.2. Receiver Location

The site was surveyed to determine the location of the most affected receiver. The nearest residential receiver to the nursery is 24 Fatherson Road a dormer bungalow to the south, and 20 Fatherson Road and an adjoining three storey dwelling with basement to the north. This is shown in the site plan in Appendix A.

2.3. Local Noise Climate

The predominant local noise sources when the outdoor space of the nursery was not in use was frequent road traffic from local road networks and occasional air traffic movements. When the nursery garden is in use activity noise from the nursery is predominant.

2.4. Measurements

The noise monitoring took place between the 17th of April 2026 to the 21st of April 2026. The measurement period was considered sufficient to establish the representative background and ambient sound levels. The weather conditions monitored during the survey are shown in the following table.

Table 1: Weather Conditions at Measurement Location

Weather	Value				
	17/04/26	18/04/26	19/04/26	20/04/26	21/04/26
Average Wind Speed	1m/s	1m/s	1m/s	1m/s	1m/s
Wind Direction	East	East	South	South	South-west
Cloud Cover	50%	30%	20%	30%	20%
Max. Temperature	17°C	16°C	14°C	15°C	14°C
Min. Temperature	11°C	4°C	0°C	0°C	4°C

Weather	Value				
	17/04/26	18/04/26	19/04/26	20/04/26	21/04/26
Precipitation	None	None	None	None	None

2.5. Measurement Results

2.5.1. Ambient Noise Measurements – No Activity

The measured broad-band sound pressure levels are shown within Appendix B. The ambient sound level(s) obtained during the daytime when the external areas of the garden were not being used, being as follows.

Table 2: Representative ambient sound levels, dB re 2×10^{-5} Pa

Measurement Position	$L_{Aeq, 16 \text{ hr}}$ Day*
MP1	60

* Day periods are defined as between 07:00 - 23:00.

2.5.2. Ambient Noise Measurements – With Activity

The ambient sound level(s) obtained during the daytime when the external areas of the garden were being used by the nursery, being as follows. The outdoor areas are only intended to be used by groups of children with accompanying staff, never the entire nursery at one time. The results in the table below are based on the worst case being 29 pupils and 7 staff, 80% of the nursery attendance.

Table 3: Representative ambient sound levels, dB re 2×10^{-5} Pa

Measurement Position	$L_{Aeq, 1 \text{ hr}}$ Day*
MP1	73

* Day periods are defined as between 07:00 - 23:00.

3. Criteria

3.1. BS4142:2014

BS4142:2014 states that the significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.

Table 4: BS4142 assessment based upon rating level

Difference between background noise and rating levels	Assessment
+ 10 dB	Indication of a significant adverse impact

Difference between background noise and rating levels	Assessment
+ 5 dB	Indication of an adverse impact
0 dB	Indication of low impact

3.2. Design Rating Levels

The design levels, based on the existing activity noise levels, are set out in the table below.

Table 5: Design rating levels, dB re 2×10^{-5} Pa

Receiver Premises	Design Level (Day), $L_{Aeq, 1 \text{ hr}}$
Boundary of nursery	73

4. Review of Current Design

4.1. Current Design

It is proposed to increase the pupil size from 37 to 50 children at Wigwam Day Nursery.

The external play areas are only intended to be used by groups of children with accompanying staff, never the entire nursery at one time. Currently up to 80% of the children and staff will use the external play areas at any one time. As up to 29 pupils and 7 staff currently use the external play areas at any one time, it is expected, with a pupil increase as proposed, up to 40 pupils and 10 staff may use the external play areas at any one time.

The guidance contained in this report is given on the basis that the existing nursery opening hours are between 07:30 and 18:00hrs.

4.1.1. Assumptions

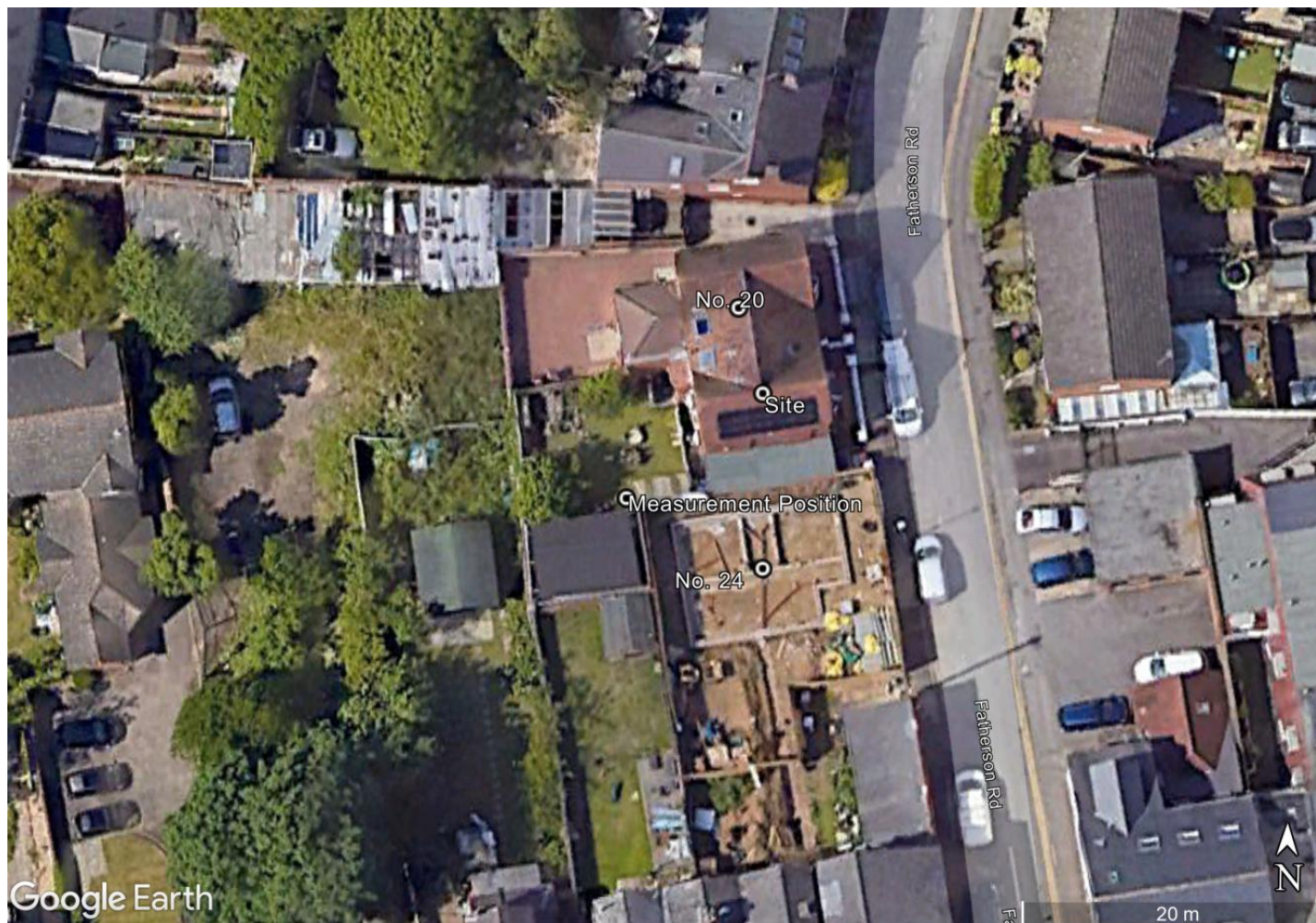
Logarithmically, doubling of a noise source would result in a 3dB(A) increase in noise level. As only a 26% increase is expected in the number of pupils, from 37 to 50, it would be fair to expect that up to approximately 1dB(A) increase in noise level would be likely. A 1dB(A) increase, when assessed against BS4142, would give an indication of low impact. It should be noted that human hearing would likely not detect a 1dB(A) increase in noise and therefore LCP conclude that the pupil increase would not negatively impact the neighbouring residents.

5. Conclusion

An environmental noise survey has been undertaken in order to establish the representative ambient and background sound levels local to the site generally in accordance with the method contained within BS4142: 2014.

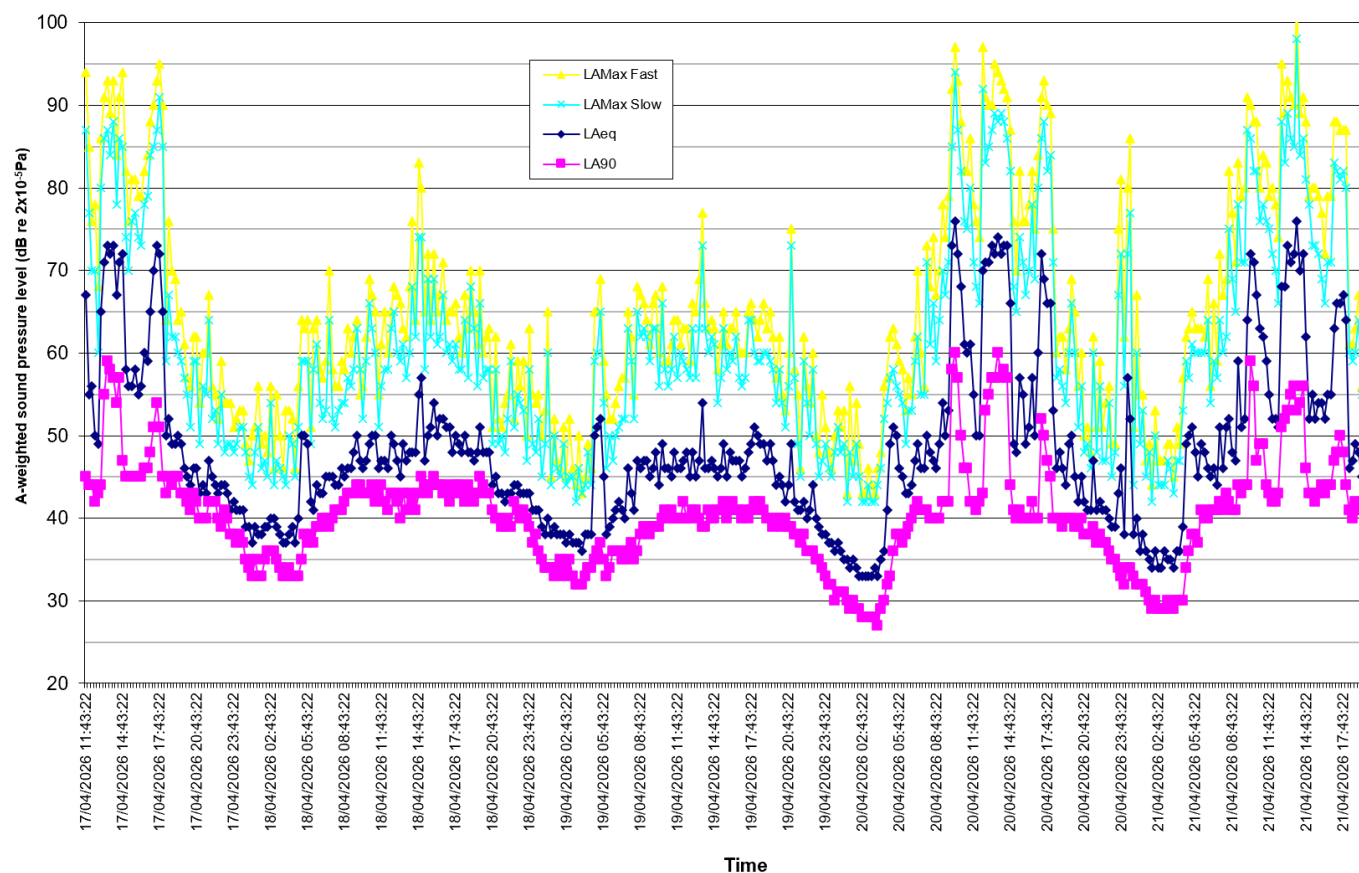
Calculations have been carried out to determine the noise levels at the nearest receiver premises. The calculations show that there will be an indication of low impact.

Appendix A: Site Plan



Approximate measurement position (Latitude & Longitude) 51°27'9.49"N, 0°57'17.60"W.
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Appendix B: Measurement Data



Sound pressure level measurements were obtained using the following instrumentation complying with the Class 1 specification of BS EN 61672:2003

- Svantek 959 Sound Level Meter S/N: 11207 (next cal due 28/07/2027) Start gain +1.71 End gain +1.84
- Svantek pre-amplifier SV12L S/N: 49860 with GRAS microphone capsule 40AE S/N: 215511

Calibration checks were made prior to and after completion of measurements using a Svantek SV30A calibrator, S/N: 10890 (next cal due 20/02/2027) complying with Class 1 specification of BS EN 60942:2003, calibration level 114.0 dB @ 1.0 kHz. All acoustic instrumentation carried current manufacturer's certificates of conformance.

Appendix C: Glossary

The list below details the major acoustical terms and descriptors, with brief definitions:

'A' Weighting

Weighting applied to the level in each stated octave band by a specified amount, in order to better represent the response of the human ear. The letter 'A' will follow a descriptor, indicating the value has been 'A' weighted. An 'A' weighted noise level may also be written as dB(A).

Airborne Noise

Noise transmitted through air.

Ambient Noise

The total noise level including all 'normally experienced' noise sources.

dB or Decibel

Literally meaning 'a tenth of a bel', the bel being a unit devised by the Bell Laboratory and named after Alexander Graham Bell. A logarithmically based descriptor to compare a level to a reference level. Decibel arithmetic is not linear, due to the logarithmic base. For example:

30 dB + 30 dB $\neq$ 60 dB

30 dB + 30 dB = 33 dB

$D_{nTw} + C_{tr}$

The weighted, normalised difference in airborne noise levels measured in a source room (L1) and a receive room (L2) due to a separating partition.

D	Is simply $L1 - L2$.
D_{nT}	Is the normalisation of the measured level difference to the expected (in comparison to the measured) reverberation time in the receiving room.
D_{nTw}	Is the weighted and normalised level difference. This value is the result of applying a known octave band weighting curve to the measured result.
C_{tr}	Is a correction factor applied to the D_{nTw} to account for the known effects of particular types of noise, such as loud stereo music or traffic noise.

Frequency (Hz)

Measured in Hertz (after Heinrich Hertz), and represents the number of cycles per second of a sound or tone.

Insertion Loss, dB

The amount of sound reduction offered by an attenuator or louvre once placed in the path of a noise level.

$L_{A90, T}$

The 'A' weighted noise level exceeded for 90% of the time period T, described or measured. The '90' can be substituted for any value between 1 and 99 to indicate the noise level exceeded for the corresponding percentage of time described or measured.

$L_{Aeq, T}$

The 'A' weighted 'equivalent' noise level, or the average noise level over the time period T, described or measured.

L_{Amax}

The 'A' weighted maximum measured noise level. Can be measured with a 'slow' (1 sec) or 'fast' (0.125 sec) time weighting.

L_{Amin}

The 'A' weighted minimum measured noise level.

NR

Noise Rating (NR) level. A frequency dependent system of noise level curves developed by the International Organisation for Standardisation (ISO). NR is used to categorise and determine the acceptable indoor environment in terms of hearing preservation, speech communication and annoyance in any given application as a single figure level. The US predominantly uses the Noise Criterion (NC) system.

Octave

The interval between a frequency in Hz (f) and either half or double that frequency (0.5f or 2f).

Pa

Pascals, the SI unit to describe pressure, after physicist Blaise Pascal.

Reverberation Time, T_{mf} , RT60, RT30 or RT20

The time taken in seconds for a sound to diminish within a room by 1,000 times its original level, corresponding to a drop in sound pressure of 60 dB. When taking field measurements and where background noise levels are high, the units RT20 or RT30 are used (measuring drops of 20 or 30 dB respectively). Sometimes given as a mid-frequency reverberation time, T_{mf} which is the average of reverberation time values at 500Hz, 1kHz and 2kHz.

R_w

The sound reduction value(s) of a constructional element such as a door, as measured in a laboratory, with a known octave band weighting curve applied to the result.

Sound Power Level

A noise level obtained by calculation from measurement data, given at the face of an item of plant or machinery. Referenced to 10^{-12} W or 1pW.

Sound Pressure Level

A noise level measured or given at a distance from a source or a number of sources. Referenced to 2×10^{-5} Pa.

Subjective Effect of Changes in Sound Pressure Level

The table below details the subjective effects of variations in sound pressures (adapted from Bies and Hansen).

Difference between background noise and rating levels	Increase in ambient noise level in 'real terms'	Change in apparent loudness
+ 10 dB	+ 10 dB	Twice as loud
+ 5 dB	+ 6 dB	Clearly noticeable
0 dB	+ 3 dB	Just perceptible
-10 dB	0 dB	No change

W

Watts, the SI unit to describe power, after engineer James Watt.