

TECHNICAL MEMO

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To: **Richard Trew**
Rivington Street Studio

richard.trew@rssa.co.uk

From: **Ben Lindsay**
Assistant Consultant
E: ben.lindsay@andersonacoustics.co.uk
T: 07984 526116

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SUBJECT: ST PAULS JUNIOR SCHOOL – NOISE IMPACT ASSESSMENT

1 INTRODUCTION

Wokingham Borough Council is expanding St Pauls Junior School, Oxford Road, Wokingham, RG41 2YJ, to produce a new SEND Resource Provision Building at the site.

It is understood that a number of new plant items have been proposed to serve the new development.

This report by Anderson Acoustics Ltd establishes plant noise criteria to ensure the amenity of nearby residential receptors are safeguarded. The criteria have been informed by a background noise survey, local authority guidance, as well as our experience working on similar projects.

This report is technical in nature and, as such, a summary of noise units and terminology used within this report can be found [here](#).

2 DESIGN CRITERIA

It is understood there are currently no planning conditions associated with the development. Design criteria stipulated by Wokingham Borough Council (WBC) are summarised below, alongside relevant standards.

2.1 WOKINGHAM BOROUGH COUNCIL GUIDANCE

Wokingham Borough Council does not set out any specific guidance relating to plant noise criteria. It is therefore appropriate to consider guidance outlined in BS 4142. A summary of this standard is given in Section 2.2.

2.2 BRITISH STANDARD 4142:2014+A1:2019

Guidance on the assessment of the impact of noise from fixed installations and sources of an industrial nature is provided in BS 4142:2014.

BS 4142 provides methods for rating and assessing sound/noise of an industrial or commercial nature in relation to residential premises, hence its relevance here. The assessment methodology evaluates the “specific sound level” of each industrial or commercial sound source, corrects for distinguishable features to derive the “rating level”, and compares this with the “background sound level”.

The advice is that the background sound level ($L_{AF90,T}$) should be derived from continuous measurement of normally not less than 15-minute intervals over the period of interest, and that it should not be the lowest level, but representative of typical conditions at the noise-sensitive receptor(s) relevant to the periods of operation.

The specific sound level ($L_{Aeq,T}$) is obtained (by measurement or calculation) over a reference period of 1 hour in terms of the daytime (07:00 to 23:00) and 15 minutes during the night-time (23:00 to 07:00).

The rating level ($L_{Ar,Tr}$) is the specific sound level corrected to account for any acoustic features present in the sound in question, as experienced at the receptor, such as distinguishable, discrete, continuous note (a whine, hiss, screech or hum etc.) or distinct impulses (bangs, clatters or thumps etc.). Where no correction is warranted, the rating level is equal to the specific level.

The “subjective method” to calculate the rating level incorporates the following corrections (particularly appropriate for new sources that cannot be measured in-situ):

- Up to +6 dB due to tonality, subjectively this might be +2 for a tone that is just perceptible, +4 where it is clearly perceptible and +6 where it is highly perceptible.
- Up to +9 dB for impulsivity, subjectively this might be +3 for impulsivity that is just perceptible, +6 where it is clearly perceptible and +9 where it is highly perceptible; and
- Up to +3 dB for other acoustic features that are neither tonal nor impulsive, though readily distinctive at the receptor.

An “initial estimate” of the impact of the specific sound is calculated by subtracting the measured background sound level from the rating level. The following advice applies:

- a) Typically, the greater this difference, the greater the magnitude of the impact.
- b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source 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.

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. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur.

Where the initial estimate of the impact needs to be modified due to the context, the assessment should take into account all pertinent factors, including:

- the absolute level of sound
- the character and level of the residual sound compared to the character and level of the specific sound, and
- the sensitivity of the receptor and whether dwellings will already incorporate design measures that secure good internal and/or outdoor acoustic conditions

2.3 BUILDING BULLETIN 93

Building bulletin 93 sets out maximum indoor ambient noise levels of up to 40 dBA for new build, naturally ventilated general teaching spaces.

The indoor ambient noise level includes noise from external sources transmitted via the building fabric, mechanical services, and electrical systems. However, it excludes noise from occupants and their activities (i.e. teaching activities).

Site noise levels have been considered to demonstrate that suitable indoor ambient noise levels can be maintained.

3 SITE DESCRIPTION

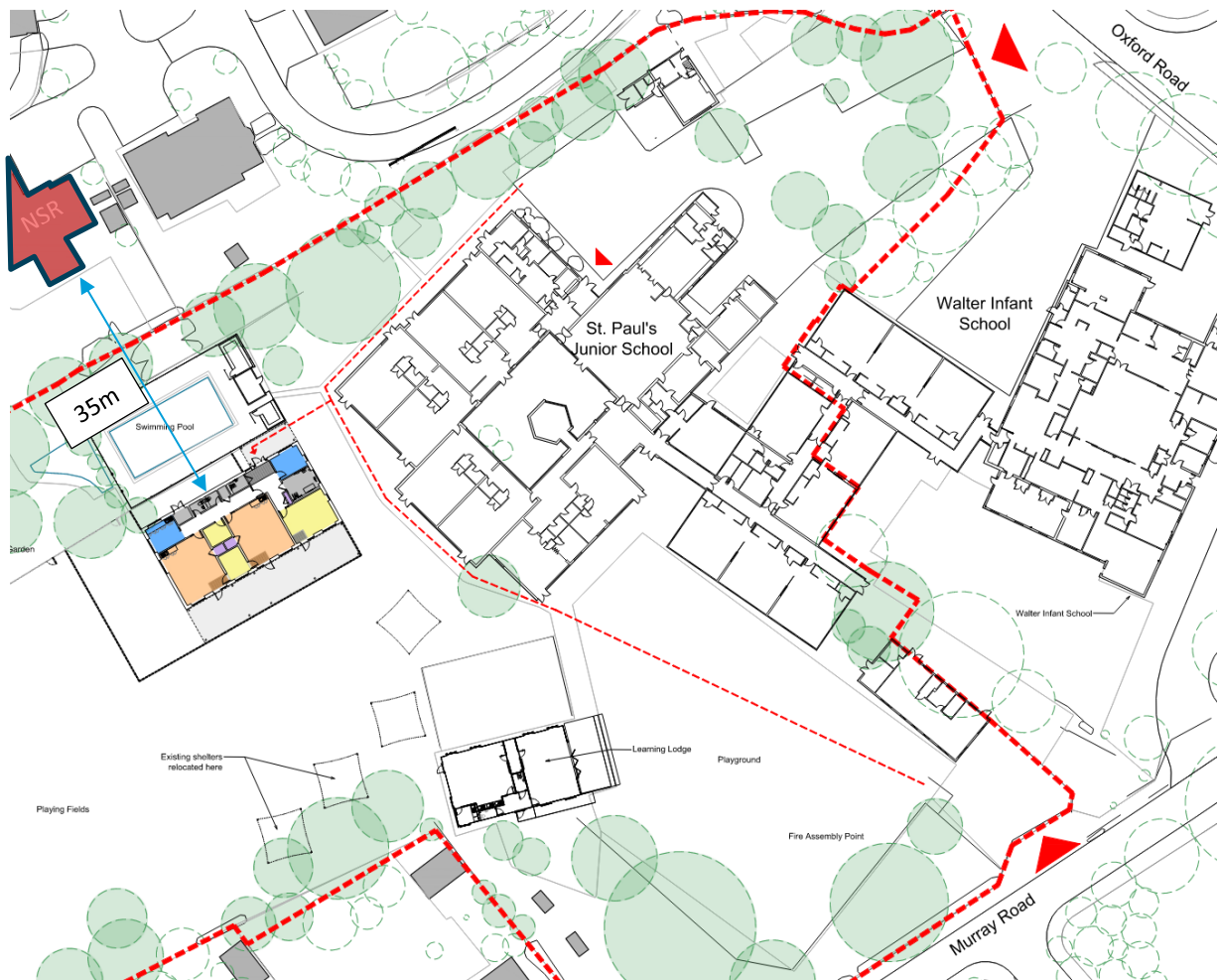
St Paul's Junior School is located on Oxford Road in a predominantly residential and urban area of Wokingham, Berkshire. To the north and west, the site is bounded by residential streets with houses and neighbourhood development. To the south and east, the environment continues as suburban housing with local roads and community amenities reflecting the Emmbrook and wider Wokingham setting. Typical suburban traffic, pedestrian movements, and nearby school use define the immediate noise-relevant context.

An aerial view of the site is displayed in Figure 3-1, with the unattended monitoring position marked in purple.

Figure 3-1: Existing site and Unattended Monitoring Position



Figure 3-2: Proposed site plan with nearest NSR marked



4 ENVIRONMENTAL NOISE SURVEY

Background noise levels captured at monitoring position UP1 is considered representative of the nearest noise sensitive receptor 2 Villiers Mead, which is located approximately 35m away from the closest proposed façade location and will therefore be used for this assessment. It was noted during site visits that the dominant noise source was road traffic noise from adjacent roads, and that secondary noise sources included birdsong and rustling of nearby trees.

4.1 INSTRUMENTATION

Details of the equipment used in the survey are shown in Table 4-1. Equipment was calibrated before and after the survey and no significant drift in calibration was observed.

Table 4-1: Survey Equipment Details

Description	Equipment	Serial no.	Calibration Expiry	Calibration Certification No.
Sound Level Meter	Rion NL-52 Sound Level Meter	00643027	01/09/2027	TRCT25/1651
	Preamplifier NH-25	44865		
	Microphone UC-59	26222		
Calibrator	Rion NC-75 Calibrator	34456697	30/04/2026	CONF042505

4.2 UNATTENDED SURVEY RESULTS

Table 4-2 presents the results from the unattended monitoring at the position indicated in Figure 3.1. The histogram detailed in Figure 4-1 indicates that the typical modal background sound level is 42 dB $L_{A90,15min}$ during the daytime period and 30 dB $L_{A90,15min}$ during the night-time period. $L_{A90,15min}$ data has been presented as it is likely to represent a worst case for the daytime $L_{A90,1hr}$ and night-time $L_{A90,15min}$ assessment. Weather conditions were fair during the period of monitoring and are not considered to have affected the survey data significantly. The time history for the measurement position is presented graphically in the Appendix of this report.

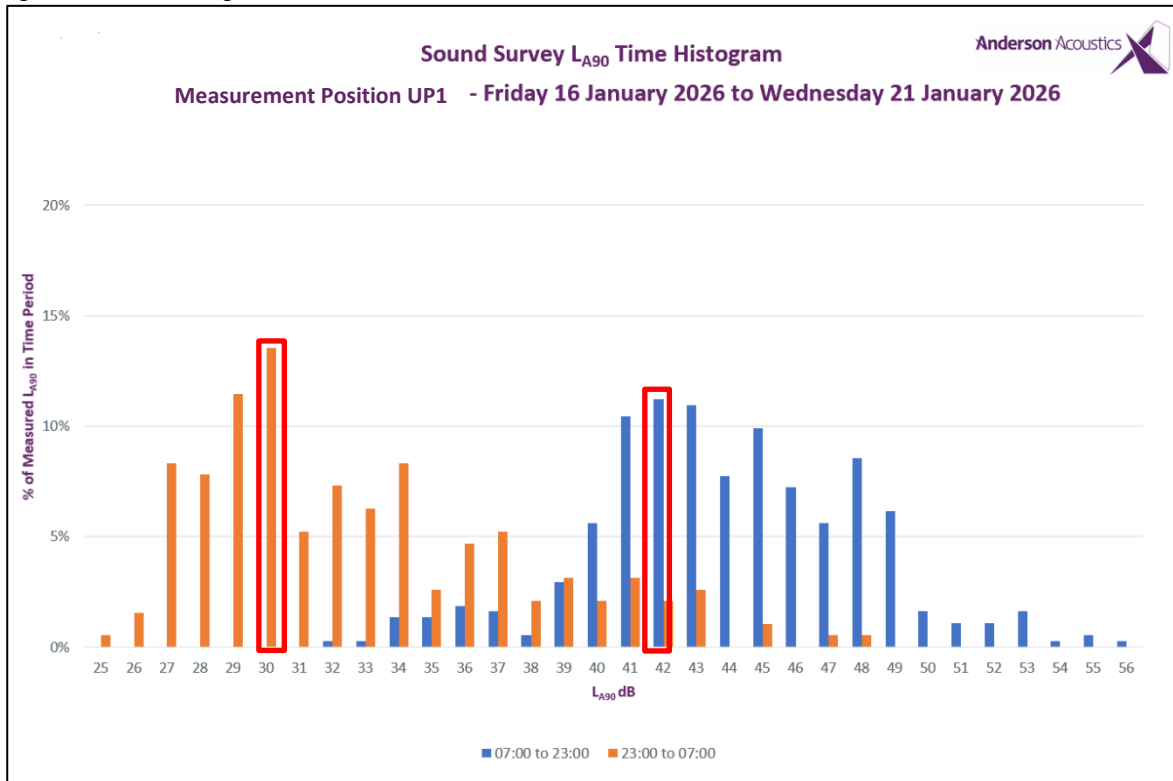
Table 4-2: Unattended Survey Results – UP1

Date	Assessment Period, T	Background sound level $L_{A90, 15min}$ (dB) ¹	Ambient sound level $L_{Aeq, T}$ (dB)
Friday 16 th January 2026	Day time (14:00-23:00) ²	44	52
	Night-time (23:00-07:00)	33	42
Saturday 17 th January 2026	Day time (07:00-23:00)	42	47
	Night-time (23:00-07:00)	34	37
Sunday 18 th January 2026	Day time (07:00-23:00)	41	47
	Night-time (23:00-07:00)	29	37
Monday 19 th January 2026	Day time (07:00-23:00)	43	51
	Night-time (23:00-07:00)	27	37
Tuesday 20 th January 2026	Day time (07:00-23:00)	47	52
	Night-time (23:00-07:00)	30	41
Wednesday 21 st January 2026	Day time (07:00-23:00)	49	51
	Night-time (23:00-07:00)	34	41
Full Survey Period	Day time (07:00-23:00)	42	50
	Night-time (23:00-07:00)	30	39

¹Modal value used (most frequently occurring 15 min background noise level over survey period).

²This is a partial measurement period.

Figure 4-1: $L_{A90,15min}$ Histogram – UP1



5 ASSESSMENT CRITERIA – PLANT NOISE EMISSIONS TO RESIDENTIAL

The nearest noise sensitive premises have been identified as the residential premises 2 Villiers Mead, located approximately 35m away from the proposed new plant items. Background noise levels captured at monitoring position UP1 are considered representative of this nearest noise sensitive receptor and will therefore be used for this assessment.

In this case, measured background levels are:

- Daytime: 42 dB(A)
- Night-time: 30 dB(A)

Appendix A of BS 4142:2014 states that where the rating level at the worst-affected noise sensitive receptor does not exceed the background sound level, this indicates a low impact. Therefore, we propose the following plant noise limits (see summary in Table 5-1):

- During the daytime, the plant noise limit will be set at 42 dB(A).
- In this case, the night-time background level is 30 dB(A), and setting the plant noise limit at the same level ensures compliance with this low-impact criterion. Furthermore, BS 8233:2014 recommends a maximum internal night-time noise level of 30 dB $L_{Aeq,8hr}$ for bedrooms, so an external limit of 30 dB(A) is consistent with achieving this guidance and offers appropriate protection for residential amenity. To provide further context, if a window is partially open, regardless of the façade construction, a typical sound reduction of 10–15 dB can be achieved, meaning indoor ambient night-time noise levels would be around 15–20 dB(A), which is comfortably below the guidance noise level for bedrooms in accordance with BS 8233:2014.

Table 5-1: Plant Noise Limits

Position	Time Period	Measured Background Noise Level, dB L_{A90}	Proposed Noise Limit at Receptor, dB $L_{A,r,Tr}$
NSR (2 Villiers Mead)	Daytime (07:00 – 23:00)	42	42
	Night-time (23:00 – 07:00)	30	30

It should be noted that whilst we have included a limit for day and night-time, at this stage it is not clear whether plant will be operational during the night-time.

As plant selections have not yet been made, it is not currently known if the plant is likely to be tonal or intermittent in nature.

5.1 PLANT NOISE EMISSIONS TO SCHOOL BUILDING

Noise ingress from the plant to the new and existing spaces will also be considered. Assuming 10-15 dB sound attenuation from a partially open window, and a target indoor ambient noise level of less than 35 dBA from plant noise, as set out in BB93, this will result in a maximum limiting plant noise level of 45 dB at 1m from the nearest existing or new teaching space or office. Subject to the installation of a suitably constructed acoustic enclosure, plant noise emissions are expected to comfortably comply with BB93 guidance.

It is also noted within the IoA Acoustics of Schools: A Design Guide that “Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB $L_{Aeq,30min}$ ”. Therefore, plant noise emissions have also been considered around these areas. Plant noise emissions are expected to comply with this guidance even in the absence of mitigation; therefore, the construction of a suitable enclosure should result in noise emissions that comfortably comply with this guidance.

5.2 AMBIENT NOISE LEVELS FOR PROPOSED DEVELOPMENT

Measured noise levels indicate that suitable indoor ambient conditions for the proposed teaching spaces can be maintained through appropriate means of ventilation.

6 SUMMARY

This technical memo details the background noise survey carried out by Anderson Acoustics at the site of St Pauls Junior School, Wokingham. The results of the survey have been used to set out plant noise criteria in consideration of the nearest offsite residential receptor as well as at the school building itself.

It is anticipated that if plant noise levels are controlled such that they do not exceed the targets set out in the above report, then plant noise emissions should comply with BS 4142 guidance, as well as guidance detailed within BB93 and the IoA Schools Design Guide.

Once the plant location and model selection has been finalised, a noise impact assessment will be carried out to ensure that the noise limits detailed in this report are complied with.

APPENDIX

TIME HISTORY GRAPH

Sound Survey Time History Graph

Measurement Position UP1 - Friday 16 January 2026 to Wednesday 21 January 2026

