

REF: L1138.1 V1



Mr Tom Postance
Darwin Group Limited
London House
Shawbury Business Park
SHREWSBURY
SY4 4EA

The Red Suite, 1st Floor
Aztec Centre
Aztec West
Almondsbury
BRISTOL BS32 4TD

T: 01454 203777
www.redtwin.co.uk

12th June 2019

**RE: KENDRICK SCHOOL, READING
NOISE SURVEY SUMMARY**

Dear Mr Postance,

Following our recent correspondence, we are writing to you with respect to the above project, to provide a summary of a recent noise survey that was carried out at the proposed development site at Kendrick School.

The noise survey results have established the pre-development noise levels and design levels for the new building in a representative location during daytime hours.

1.0 MEASUREMENT METHOD...

The measurement has been carried out in full accordance with the following standards and guidance:

- BS 7445-1:2003: Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.
- BS 7445-2:1991: Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use.
- BS 4142:2014: Methods for rating and assessing industrial and commercial sound.
- ANC Green Book Guidelines.

Full details of the survey and results are provided in Appendix A.

A measurement of the background and ambient sound level has been made at ground level in a representative location of the proposed building development and the nearest noise sensitive neighbours.

The measurement has been carried out during daytime hours to identify the noise exposure during the normal times of use.



The background and ambient sound at site are dominated by traffic from the nearby main roads, existing building services, aircraft, birdsong and existing school activity.

The measurement location is considered to be representative of both the proposed development and the nearest residential dwelling.

2.0 MEASUREMENT RESULTS...

BB93 defines the internal ambient noise level as an equivalent continuous sound pressure level over a 30-minute period, denoted $L_{Aeq,30min}$ in the absence of school activity. BB93 also defines a value for regular noisy events as the sound pressure level exceeded for 1 % of the time within a 30-minute period, denoted $L_{A1,30mins}$.

We have established the external $L_{Aeq,30min}$ considered representative of the normal school hours in the vicinity of the proposed building site, between 08:30 and 15:30, which is summarised in Table 1.

The values given have been taken from the most typical of the measurement data periods.

Location	L_{Aeq}	L_{A1}	Unweighted L_{eq} Sound Pressure Level (dB Re 20 μ Pa) in 1/1 Octave Band Centre Frequencies (Hz)							
			63	125	250	500	1000	2000	4000	8000
1	50	58	57	55	49	44	45	44	33	20

TABLE 1: DESIGN DATA FOR PROPOSED SCHOOL (FREE-FIELD LEVEL)

3.0 IMPLICATIONS OF THE SITE NOISE EXPOSURE...

Within BB93 most teaching spaces are required to achieve an indoor ambient noise level of 35 dB(A) $L_{Aeq,30mins}$ or less, and regular discrete noise events, eg, aircraft or trains, should not exceed 60 dB $L_{A1,30mins}$. A relaxation of 5dB(A) is applicable to natural ventilation methods.

To assess the effect on the ventilation strategy we have considered the resulting internal noise level if opening windows were used as the means of ventilation.

The reduction of external noise passing through an open window is a complex subject and commonly approximated following the guidance from the World Health Organisation that states an open window will reduce the external noise level measured 2 m from the façade by 10 to 15 dB(A). Napier University has conducted extensive research into the effects of window openings and concluded a similar level of attenuation, with dependencies on the type of opening, of between 12-18 dB(A) to traffic noise. We have used a value of 13 dB(A) reduction from the façade noise level.

The façade noise level is taken to be 3 dB(A) greater than measured in a free-field as was obtained on site.

With open windows the resulting indoor ambient noise levels in a typical classroom would be expected to be approximately 40 dB(A) $L_{Aeq,30min}$ and 48 dB(A) $L_{A1,30min}$.

We can conclude that using opening windows is an appropriate approach for the ventilation of the proposed building on this site.

I hope you find this summary of assistance. Please advise if you require anything further.

Yours sincerely,
For Red Twin Limited



Gavyn Bache B.Sc.(Hons) PgD AMIOA
Acoustic Engineer

APPENDIX A – NOISE SURVEY DETAILS...

Address:

Kendrick School, 41-43 London Road, Reading, RG1 5BN

Date

Tuesday 11th June 2019

Measurement Locations

The microphone was located at the centre of the sports area where the new building is proposed to be constructed. The microphone was tripod mounted in a free-field at 1.5 m above the ground in a location that is considered to be representative of the proposed development.

Personnel

The survey was attended at all times by Gavyn Bache of Red Twin Limited.

Equipment

Brüel & Kjær 2270 G4 hand held analyser, serial No 3025052, with a Brüel & Kjær Type 4189 Microphone, serial No 2726161. The microphone was fitted with a UA-1650 windshield. The hand held analyser and microphone was laboratory calibrated on 17th October 2018 (Certificate No. U29820) and the calibrator was laboratory calibrated on 17th October 2018 (Certificate No. U29818). The hand-held analyser calibration was checked before and after the measurements using the calibrator and a drift of 0.00 dB was observed which is not significant and no adjustments to the measurements have been made to the data.

Weather

The weather was suitable for a noise survey for the majority of the survey with still conditions. The sky was overcast and there was light drizzle at times. Wind speeds were low $< 5 \text{ m s}^{-1}$ and were suitable for noise surveying and considered to be in full accordance with BS7445.

Survey Comments

We observed that the main sources of ambient sound affecting the survey were traffic from the nearby main roads, existing building services, aircraft, birdsong and existing school activity.

Results

The survey measurements have been summarised in Table 2. The data has been obtained in 1 second increments. For the purposes of reporting we have reduced the data into 30-minute periods. Further data is available upon request. We have excluded periods affected by students passing between lessons and that of break times.

Location	Start Time	Duration	Parameter dB(A)				
			L _{AFmax}	L _{Aeq}	L _{A1}	L _{A10}	L _{A90}
1	09:24:27	00:05:33	59	49	56	52	46
	09:30:00	00:26:40	72	51	60	52	46
	10:00:00	00:30:00	65	50	58	52	46
	10:30:00	00:11:15	60	50	58	54	46
	11:20:00	00:10:00	69	49	59	51	45
	11:30:00	00:16:23	72	50	61	51	45
Total	09:24:27	01:39:51	72	50	58	52	46

TABLE 2: MEASURED NOISE DATA – MEASUREMENT LOCATION 1 – DAY TIME - FREE-FIELD



FIGURE 1: PHOTOGRAPH OF SURVEY LOCATION 1 LOOKING DUE WEST

APPENDIX B – SITE LOCATION PLANS...



FIGURE 2: SITE LOCATION PLAN - SITE SHOWN HIGHLIGHTED