Project

Norwich Road, Aylsham

Prepared for

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P1	18 October 2019	First issue

Summary

SRL Technical Services Limited has been commissioned by Norfolk Homes / Cornerstone Planning to measure noise at the proposed site of a residential development at land off Norwich Road, Aylsham. This report sets out our initial assessment of the site and compares the noise levels to a previous assessment completed at the site in 2012 by Adrian James Acoustics (AJA).

The main source of noise at the site is road traffic from the A140 and Norwich Road. Our assessment showed that the noise levels at the site have generally increased slightly since the AJA survey in 2012.

Site layouts are not currently available, so our advice at this stage should be considered outline and indicative. When more detailed information is available, we will revise our assessment. Based on our survey data, noise levels at the site are generally low enough that non-acoustic glazing and trickle vents can be used across the majority of the site.

However, there are some areas of the site that may require acoustically rated glazing and trickle ventilators to achieve the indoor ambient noise levels set out in ProPG.

We will revise our assessment when more detailed information regarding the site layout and proposed dwellings is available.

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Contents

1.0 Introduction

The proposed site is located on a plot of land between Norwich Road and the A140, Aylsham as shown in BLUE on Figure 1. There is not an indicative site layout available for the scheme at the time of writing this report.

Figure 1 - Site location

2.0 Criteria

2.1 Indoor ambient noise levels

In the absence of any planning conditions relating to noise, I have based the indoor ambient noise levels on the guidance set out in the Professional Practice Guidance on Planning and Noise (ProPG) which was published June 2017.

ProPG provides guidance on a recommended approach for managing noise appropriately within the planning system for new housing. It is not an official government code of practice, nor does it replace or provide an authoritative interpretation of the law or government policy, but it does help to draw together existing policies, such as the National Planning Policy Framework (NPPF) and provides additional guidance which helps fill in some of the current gaps.

This document has been jointly created by three bodies: The Institute of Acoustics, the Association of Noise Consultants and the Chartered Institute of Environmental Health. The key message is the drive to adopt "Good Acoustic Design" for every new housing scheme to protect people from the harmful effects of noise.

ProPG aims to establish a framework for assessing proposed developments by looking at the potential 'risks' from noise affecting the site, and establishing suitable noise criteria. The fundamental approach is to do an initial noise risk assessment of the site; unless the risk is deemed to be negligible, a full noise assessment is expected. This involves establishing suitable noise criteria and developing a Good Acoustic Design to achieve them, wherever possible. In the case of this site, the noise levels experienced from the nearby noise sources indicate that an assessment of noise affecting the development is advisable.

However, the foreword of ProPG also points out that 'Good acoustic design does not mean "gold plating" or significantly increasing costs. This guidance seeks to encourage and promote design outcomes that are proportionate and reasonable in the particular circumstances of each development site.'

While the aim of a noise assessment like this is to provide acceptable amenity, it must be recognised that this proposed scheme sits within an existing community already exposed to road traffic noise from the same roads.

ProPG refers to BS8233:2014 for suitable guidance on indoor ambient noise levels. I have summarised these guidelines in Table 1.

Table 1 - Recommended indoor noise levels for dwellings from BS8233:2014

Location	07:00 to 23:00 hours	23:00 to 07:00 hours
Living Room	35 dB $L_{Aeq,\ 16\ hour}$	-
Bedroom	35 dB $L_{Aeq,\ 16\ hour}$	30 dB $L_{Aeq,\ 8\ hour}$ and 45 dB L_{AFmax}*

Regular individual noise events such as passing trains can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax,F}$ more than 10 times a night.

2.2 External noise levels

For outdoor areas, such as gardens, ProPG refers to BS 8233:2014 which recommends the following:

> *'It is desirable that the external noise level does not exceed 50 $L_{Aeq,T}$ dB, with an upper guideline value of 55 $L_{Aeq,T}$ dB which would be acceptable in noisier environments. However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'*

3.0 Survey

SRL Technical Services Ltd has measured noise at the proposed site to determine the existing environmental noise levels affecting the proposed dwellings.

We attended site on 2 October 2019 to measure sample short term daytime noise levels around the site at positions ST1 – ST4. We set up unattended loggers (LT1 and LT2) in two locations which measured noise levels at site until they were collected on 9 and 7 October 2019 respectively. All measurements positions were at a height of 1.5m above ground level and in free field conditions. ST1 and LT1 were approximately 5m from Norwich Road, ST2 and LT2 were approximately 6m from Norwich Road, ST3 was approximately 4m from the boundary edge of the field, and ST4 was approximately 3m from Buxton Road. Our measurement positions are shown in Figure 2 below.

Figure 2 - Measurement positions

The dominant sources of noise were road traffic on the A140 and Norwich Road, as well as intermittent traffic on Buxton Road, birdsong and wind in the trees.

3.1 Noise measurement summary

I have determined the average noise levels during the day and night-time period ($L_{Aeq,\ 16\ hr}$ and $L_{Aeq,\ 8hr}$) and the maximum levels at each measurement positions. These are summarised in Table 2.

Table 2 - Summary of measurements, dB(A)

Position	Daytime $L_{Aeq,\ 16hr}$ 07:00-23:00	Night-time $L_{Aeq,\ 8hr}$ 23:00 – 07:00	Typical night-time L_{Amax} 23:00 – 07:00
LT1	68	60	75
LT2	60	54	70
ST1	67	-	-
ST2	58	-	-
ST3	59	-	-
ST4	50	-	-

I have used the noise levels measured at LT1, LT2, ST3 and ST4 to inform this assessment.

4.0 Assessment

4.1 Modelling

We have produced a noise model of the site using CadnaA (noise modelling software). The model was calibrated using the measured noise levels at measurements positions LT1, LT2, ST3 and ST4. The predicted levels across the site during the day and night-time are shown in Figure 3 and Figure 4.

Figure 3 - Daytime levels @ 1.5m height (dB $L_{Aeq,\ 16hrs}$)

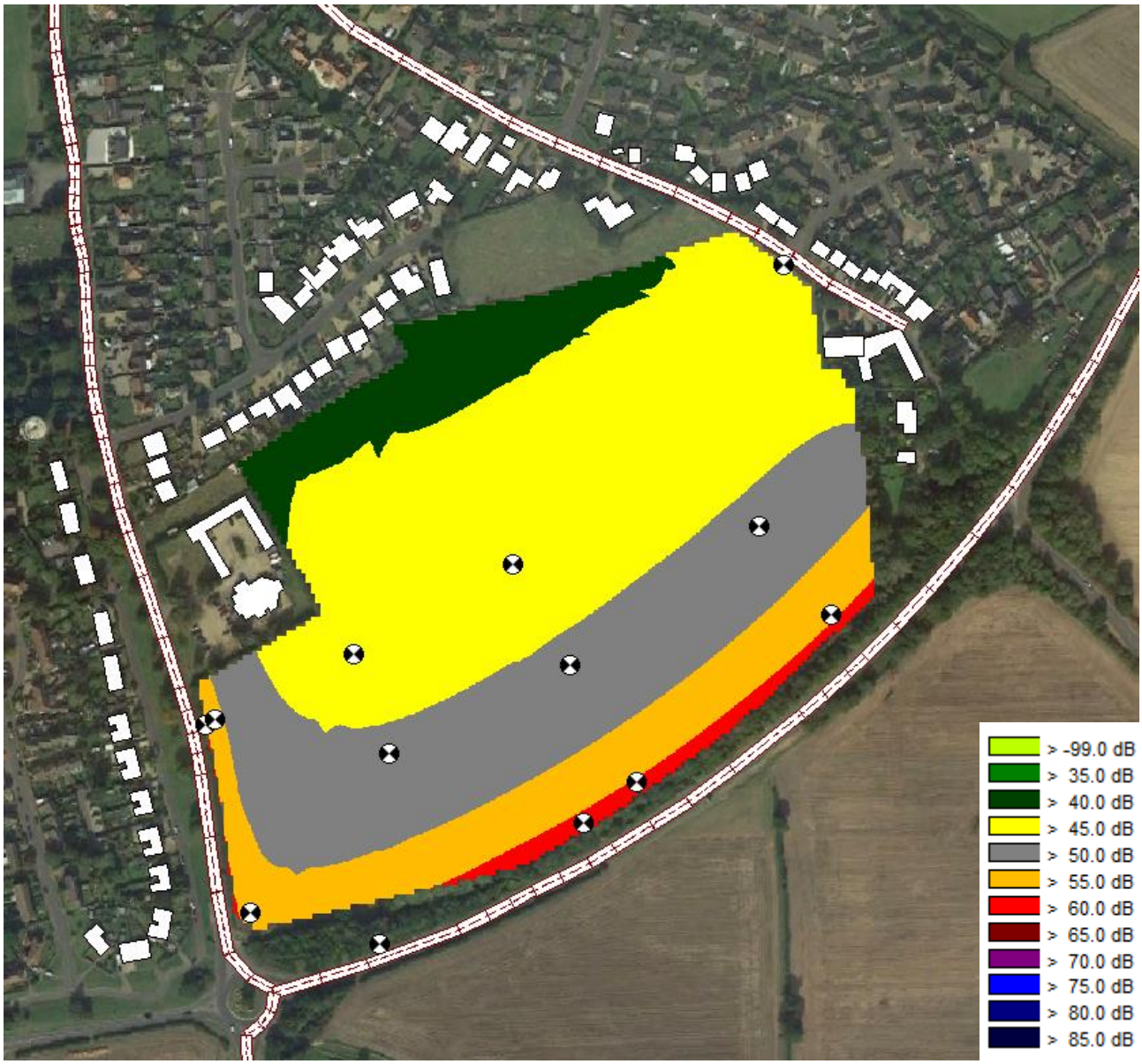


Figure 4 - Night-time levels @ 1.5m height (dB $L_{Aeq, 8hrs}$)

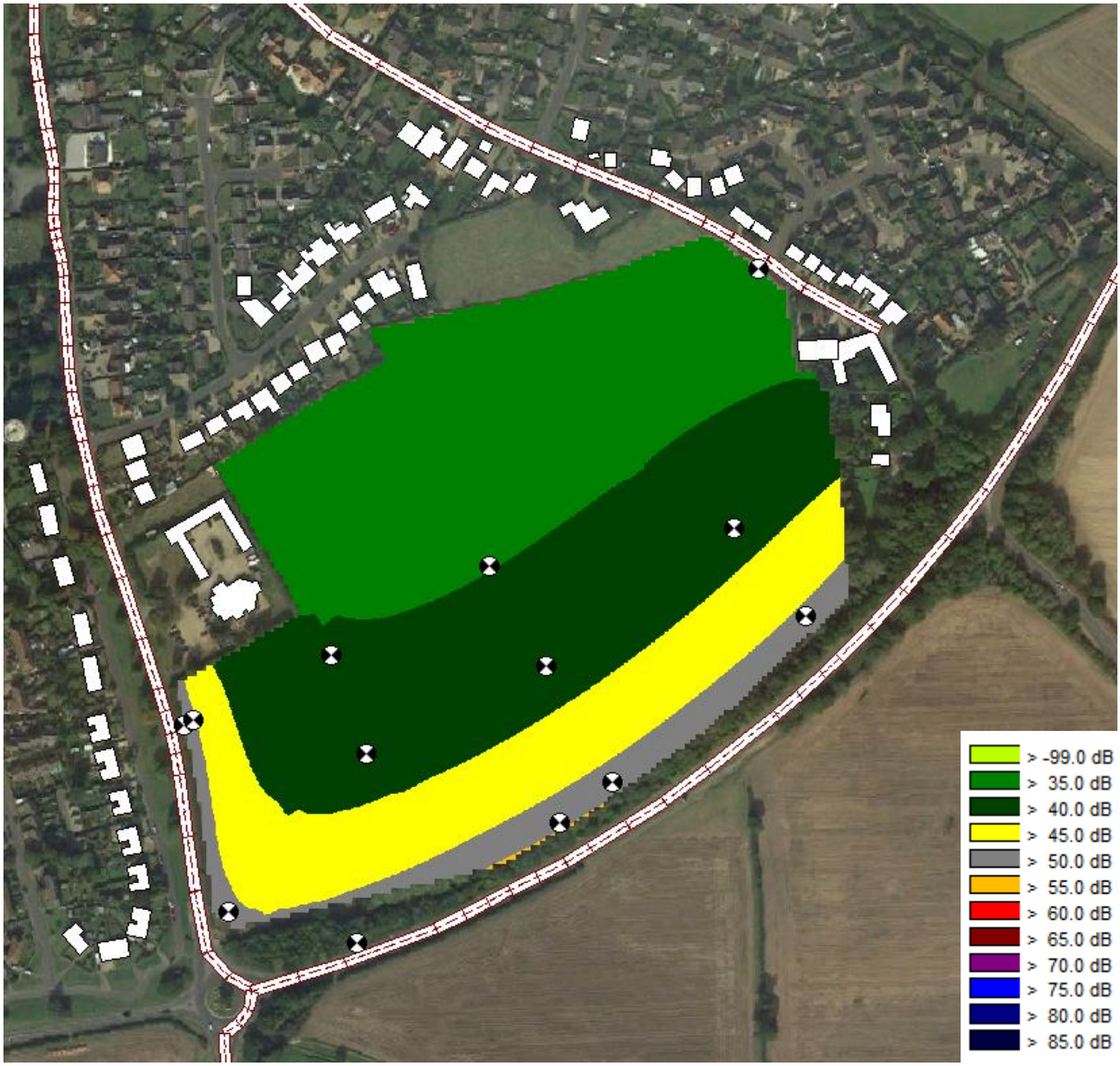
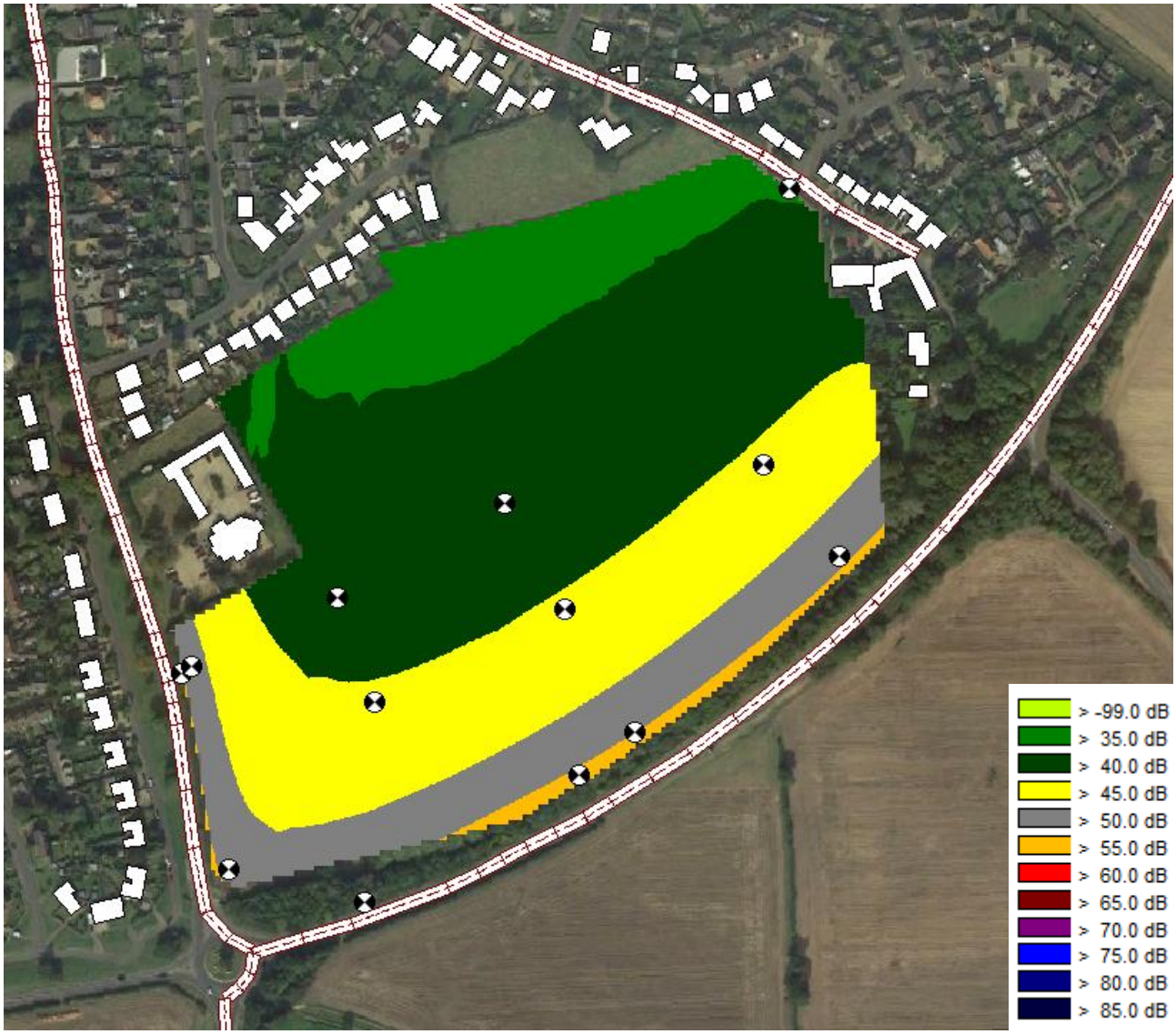


Figure 5 - Night-time levels @ 4.5m height (dB $L_{Aeq, 8hrs}$)



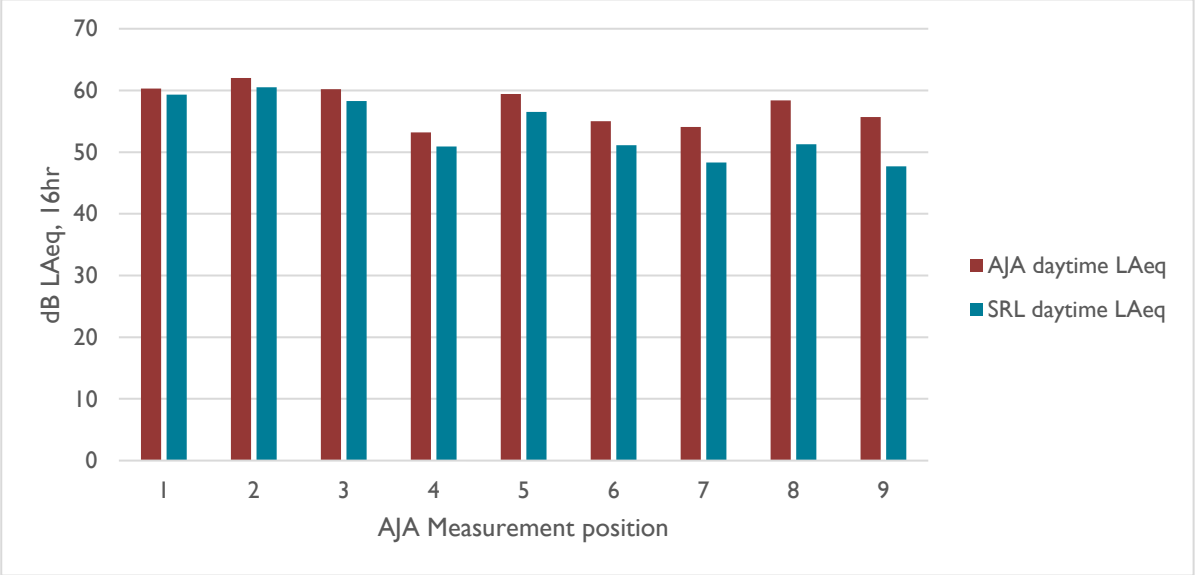
4.2 Comparison to previous survey results

The measurement positions from the survey undertaken in 2012 by Adrian James Acoustics (AJA) are shown in Figure 6.

Figure 6 - Adrian James Acoustics measurement positions

We have plotted these points on our CadnaA model to be able to compare the results from our and AJA's survey. The results are shown in Figure 7 and Figure 8.

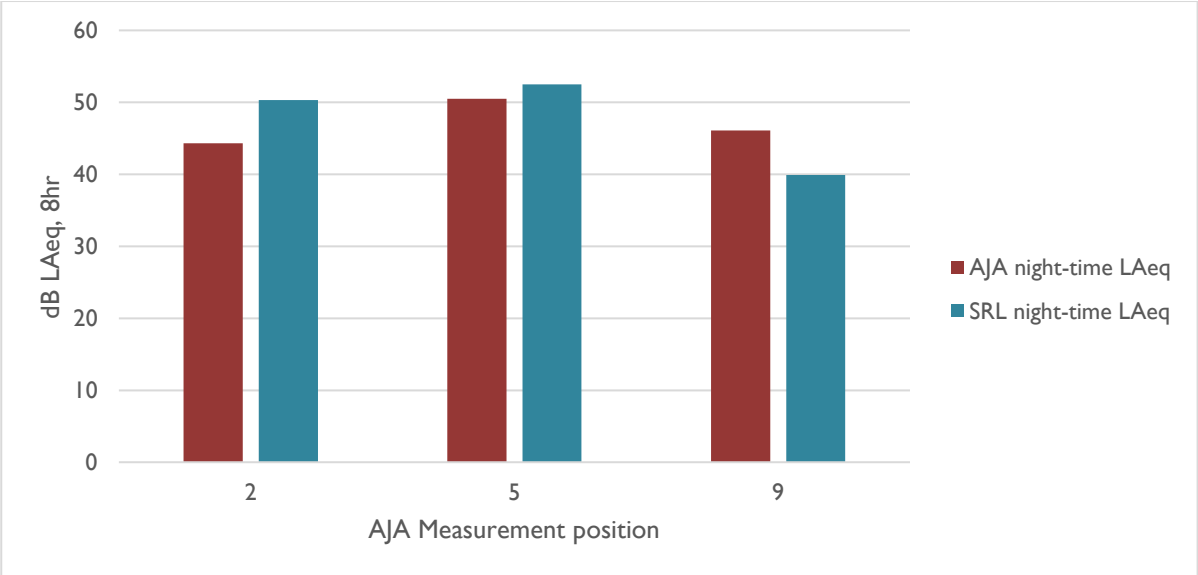
Figure 7 - Comparison of daytime results



Our daytime results are all lower than those measured in 2012. The measurement positions closest to the A140 on the southern boundary of the site (1, 5 and 8) have changed the least (by between -1 and -2dBA), and the positions closest to the middle of the site (3, 7 & 9) have changed the most (by between -6 and -8dBA).

This indicates that the volume of daytime traffic has slightly reduced since 2012.

Figure 8 - Comparison of night-time results



The night-time results vary more than the daytime results, in that they are not consistently above or below those previously measured. The results indicate that there is likely to be a slight increase in the volume of traffic on the A140 to the south of the site, and a more marked increase in the volume of traffic on Norwich Road to the west of the site. The levels at measurement position 9 in the centre of the site area shown to have reduced since the 2012 survey. I cannot be certain about the cause of this. In any case, the levels at this position from both surveys show that the site is sufficiently quiet to be able to naturally ventilate bedrooms.

4.3 Indoor ambient noise levels

The guideline levels for indoor ambient noise levels during the day and night-time are ≤35 dB $L_{Aeq,\ 16\ hours}$ and ≤30dB $L_{Aeq,\ 8\ hours}$ respectively. There is also guidance which states it is desirable for levels to not frequently exceed 45dB L_{Amax} internally at night. The glazing and ventilation strategy will be determined by the daytime L_{Aeq} levels at the site, as these are dominant compared to the night-time L_{Aeq} or L_{Amax} levels.

We have not been provided with a site plan or internal layout drawings. My general recommendations at this stage are as follows:

- I recommend that houses are not built within the areas shaded in red on Figure 4, unless a 1.8m high barrier such as a close boarded fence is installed along this boundary of the site. If a barrier is not installed these areas could be used for parking, garages or roads. I have based the rest of my recommendation on there not being any barrier installed at the edges of the site.
- It should be possible to achieve the indoor ambient noise levels in dwellings built in the areas shaded in green, yellow or grey on Figure 4 using standard non-acoustic glazing and trickle vents, or openable windows.
- It may be possible to use this strategy on façades which are shielded from the A140 and Norwich Road in the grey and orange shaded areas on Figure 4. This will depend on the site layout, orientation of buildings and use of barriers such as close boarded fences.
- Dwellings facing the A140 or Norwich Road in the grey shaded area on Figure 4 will need acoustically rated glazing and trickle vents.

I have calculated the glazing and ventilator requirements for dwellings facing the A140 or Norwich Road in the grey shaded area. My calculations are based on the following room and glazing dimensions:

- Bedrooms 2.7m high x 5.0m wide x 4.0m deep with 4m^2 of glazing
- Living rooms 2.7m high x 4.0m wide x 3.0m deep with 3m^2 of glazing

Table 3: Indicative minimum glazing and ventilator for dwellings facing Norwich Road / A140

Room	Minimum sound insulation performance for glazing	Typical glazing configuration	Minimum sound insulation performance for ventilators
Lounge	35 dB $R_w + C_{tr}$	6/16/10.8 Stadip	35 dB $R_w + C_{tr}$
Bedroom	35 dB $R_w + C_{tr}$	6/16/10.8 Stadip	37 dB $R_w + C_{tr}$

The sound reduction performance of the glazing must be achieved by both the frame and the glass when combined and tested in a laboratory as a single unit. The suitability of the glazing and ventilation selected will depend on the performance in each octave band frequency as well as overall.

When a site layout and internal layouts are available, we will update our model and calculations to provide more accurate advice on the glazing and ventilation specification. When this information is available please send it to me for review.

4.4 External amenity areas

For outdoor areas, such as gardens, ProPG refers to BS 8233:2014 which recommends that the external noise level does not exceed 50 $L_{Aeq,T}$ dB, with an upper guideline value of 55 $L_{Aeq,T}$ dB which would be acceptable in noisier environments.

The external noise level across the majority of the site is below 50dB L_{Aeq}. There is a band of approximately 50m along the southern edge of the site and a band 15m along the west edge of the site where levels are between 50-60dB L_{Aeq}.

If a 1.8m high barrier such as a close boarded fence were installed along the western and southern edges of the site, this would reduce the external levels to below 55dB L_{Aeq} across the entire site.

When more detailed information is known about the site, we will update our model and report.

Appendix A - Survey Details

A1. Location of Survey

Land off Norwich Road, Aylsham. See Figure 1.

A2. Date & Time of Survey

Daytime attended survey: 12:00 - 14:10, 2 October 2019.

LT1 unattended survey: 15:00, 7 October 2019 – 14:45, 9 October 2019.

LT2 unattended survey: 13:00, 3 October 2019 – 15:30, 7 October 2019.

A3. Personnel Present During Survey

Tom Dolton BA (Hons) – SRL Technical Services Limited

A4. Weather Conditions during Survey

Daytime survey: ~10°C, light cloud, dry, up to 12mph wind

Night-time LT1: 9-14°C, overcast, up to 7mph wind

Night-time LT2: 11-14°C, overcast, up to 7mph wind

A5. Instrumentation

Bruel & Kjaer - Noise Meter HE2

Description	Location	SRL No.	Serial	Make	Model
Sound Level Meter (HE2)	Holbrook	615	2579806	B&K	2250
Pre-amp	Holbrook	616	22126	B&K	ZC0032
Microphone	Holbrook	617	2584598	B&K	4189
Calibrator	Holbrook	618	2583398	B&K	4231

Norsonic - Noise Logger HL1

Description	Location	SRL No.	Serial	Make	Model
Sound Level Meter (HL1, Green)	Holbrook	777	1404560	Norsonic	Nor 140
Calibrator	Holbrook	753	2545771	Brüel & Kjaer	Type 4231
Pre-amp	Holbrook	777	13927	Norsonic	Type 1209
Microphone	Holbrook	777	157421	Norsonic	Type 1225
De-humidifier	Holbrook	777	255	Norsonic	Type 1284

Norsonic - Noise Logger HL2

Description	Location	SRL No.	Serial	Make	Model
Sound Level Meter (HL2, Purple)	Holbrook	779	1404737	Norsonic	Nor 140
Calibrator (93.8dB)	Holbrook	169	1541905	Brüel & Kjaer	Type 4230
Pre-amp	Holbrook	779	13919	Norsonic	Type 1209
Microphone	Holbrook	779	128712	Norsonic	Type 1225
De-humidifier	Holbrook	779	330	Norsonic	Type 1284

A6. Calibration Procedure

Before and after the survey the HE2 and HL1 measurement apparatus was check calibrated to an accuracy of ±0.3 dB using the type 4231 Sound Level Calibrator. The Calibrator produces a sound pressure level of 93.8 dB
re 2 x 10^{-5} Pa at a frequency of 1 kHz.

Before and after the survey the HL2 measurement apparatus was check calibrated to an accuracy of ±0.3 dB using the type 4230 Sound Level Calibrator. The Calibrator produces a sound pressure level of 93.8 dB re 2 x 10^{-5} Pa at a frequency of 1 kHz.

A7. Survey Procedure

Ambient noise levels were monitored at various positions around the site as shown on Figure 1. The measurements are tabulated in Appendix B, and explanations of the parameters used are listed in Appendix C.

Appendix B - Measured Ambient Noise Levels

Position	Start time	L_{A90}	L_{A10}	L_{Aeq}
ST2	12:00	49	61	58
ST1	12:12	56	71	67
ST3	12:26	51	61	58
ST4	12:42	44	50	48
ST2	13:00	48	62	59
ST1	13:13	55	70	67
ST3	13:26	52	62	59
ST4	13:41	43	51	49
ST2	14:00	47	61	58
ST1	14:13	54	70	66
ST3	14:27	53	63	60
ST4	14:42	44	54	52

Appendix C - Noise Measurement Parameter Definitions

L_{Aeq} - The "A" weighted equivalent continuous sound pressure level. A representation of a continuous sound level containing the same amount of sound energy as the measured varying noise, over the measurement period. It can be considered as the "average" noise level.

L_{Amax} - The “A” weighted maximum sound pressure level recorded over the period stated. A representation of the most obtrusive element of the noise.

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