



Report

Noise Survey and Acoustic Design Advice

Site: Carlton Road, Barnsley

Date

31st January 2019

Project Reference

R001126

Prepared for

Keepmoat Homes

We're on your wavelength

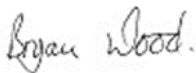
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Introduction & Summary

Resonance Acoustics were instructed by Keepmoat Homes to carry out noise surveys at a site adjacent to Carlton Road, Barnsley, in order to offer acoustic advice on achieving the required external envelope performance and background ventilation for the proposed new homes, in addition to predicting the expected noise levels of the external amenity areas.

The site is mainly an enclosed field and adjacent farmland, partially surrounded by woodland and existing housing, with an industrial estate a short distance to the east.

The internal and external noise levels of the completed dwellings should conform with the recommendations given in BS 8233:2014 and World Health Organisation advice, which are reproduced in the table below.

Table 1 - Required maximum noise levels

Situation	Daytime 07.00-23.00hrs	Night-time 23.00-07.00hrs
Living room	35 dB $L_{Aeq,16hr}$	-
Dining room	35 dB $L_{Aeq,16hr}$	-
Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$
Amenity areas	50* dB $L_{Aeq,16hr}$	-

*55 dB would be acceptable in noisier environments

In addition, during the night-time the occurrence of individual noise events above 45 dB ($L_{Amax,F}$) should be limited in number to between 10 – 15.

In summary the measured noise levels were sufficiently low to indicate that standard double glazing and standard trickle ventilation will be adequate to maintain indoor noise levels below the levels in Table 1 above.

Also the external amenity areas will be within the guideline limits if a suitable acoustic barrier is used.

Method and Results

The expected main sources of noise for this development site are the B6132 Carlton Road to the west and the industrial estate to the east.

Sound level meters (SLM's) were set up in the positions shown in Figure 1 below. Position 1 was to monitor the typical daytime noise levels close to Carlton Road and Position 2 was to monitor the night-time noise levels from the nearby industrial estate. Community engagement had revealed that the noise levels at around 03.00hrs were likely to be the highest. Two hour measurement periods were chosen as being long enough to be representative, and the particular times decided upon as being the worst-case for both positions. Full 16hr or 8hr L_{Aeq} measurements are likely to be lower than the measurements taken.

Figure 1 - Measurement positions



The results obtained are given below.

Table 2 - Results overall

SLM position	Measurement period	$L_{Aeq,2hr}$ (dB)
Position 1	06.55 – 08.55hrs	55.7
Position 2	01.57 – 03.57hrs	39.1

Table 3 - Position 1 results in octave bands

Position 1							
Hz	63	125	250	500	1k	2k	4k
dB	64.2	59.1	52.6	47.9	51.5	49.1	45.4
dB(A)	38.0	43.0	44.0	44.7	51.5	50.3	46.4

Table 4 - Position 2 results in octave bands

Position 2							
Hz	63	125	250	500	1k	2k	4k
dB	53.5	47.5	38.4	33.7	33.0	25.4	32.1
dB(A)	27.3	31.4	29.8	30.5	33.0	26.6	33.1

In addition at Position 2 there were no instances of sudden noise events of 80 dB or greater. This would indicate that it is unlikely that there will be any $L_{Amax,F}$ events internally of 45 dB or more if using standard double glazing (see Conclusions and Recommendations below).

Graphical representations of the above data are also given in Appendix 1.

Conclusions and Recommendations

Internal noise levels

It can be seen from the data above that the measured noise levels are not high and do not contain any particular tonality. However, calculations for internal noise levels using standard double glazing (4mm/12mm airgap/4mm) and standard trickle ventilation based on typical masonry wall constructions were carried out. The results of these calculations are as shown in the table below.

Habitable space	Assumed volume m ³	Assumed reverberation time (seconds)	Internal noise level (dB)
Living room	50	0.5	25
Bedroom	30	0.3	9

In addition, as indicated earlier, the noise levels were sufficiently low to indicate that there should be no incidences of individual noise events of 45 dB or above.

Copies of the calculations are given in Appendix 2.

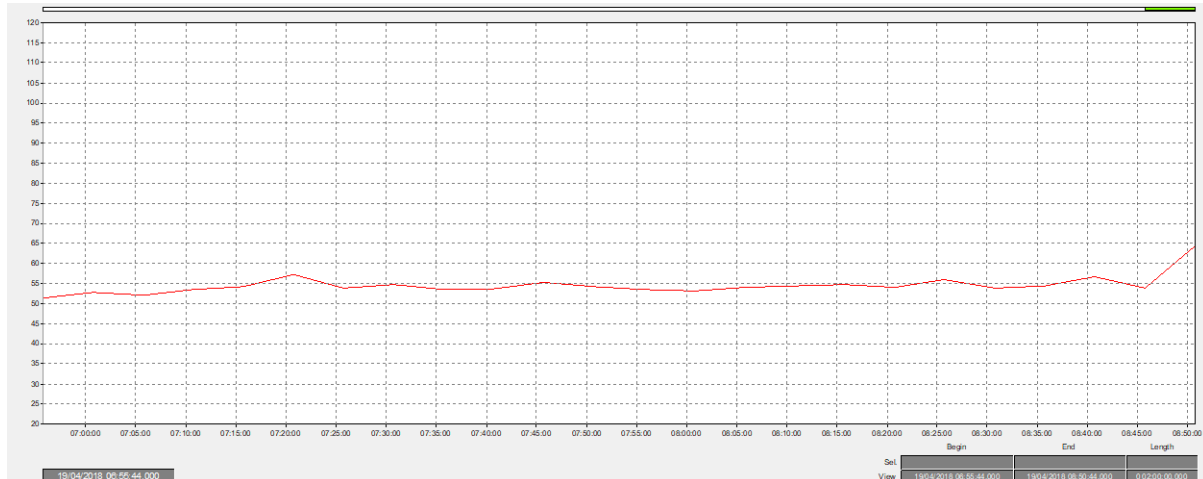
External noise levels.

Noise levels in external amenity areas will be kept at or below the level given in Table 1 above if the westernmost boundaries of plots 1 and 14 are 2m high and are constructed from brickwork or timber of at least 10kg/m². If using timber it is important to ensure that no air gaps exist between or under any panelling used.

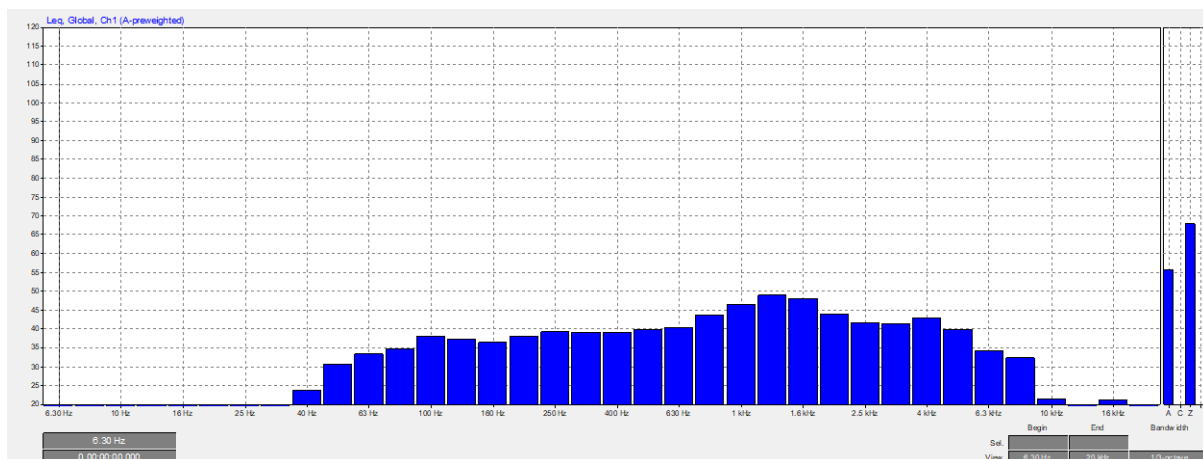
Appendices

Appendix 1 – Recorded data

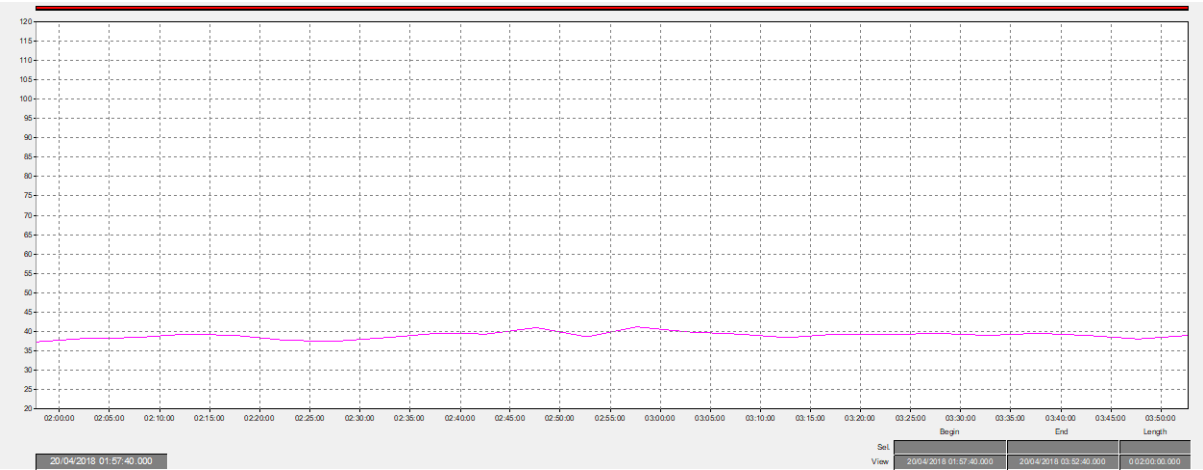
Daytime noise levels over time (dB on left axis)



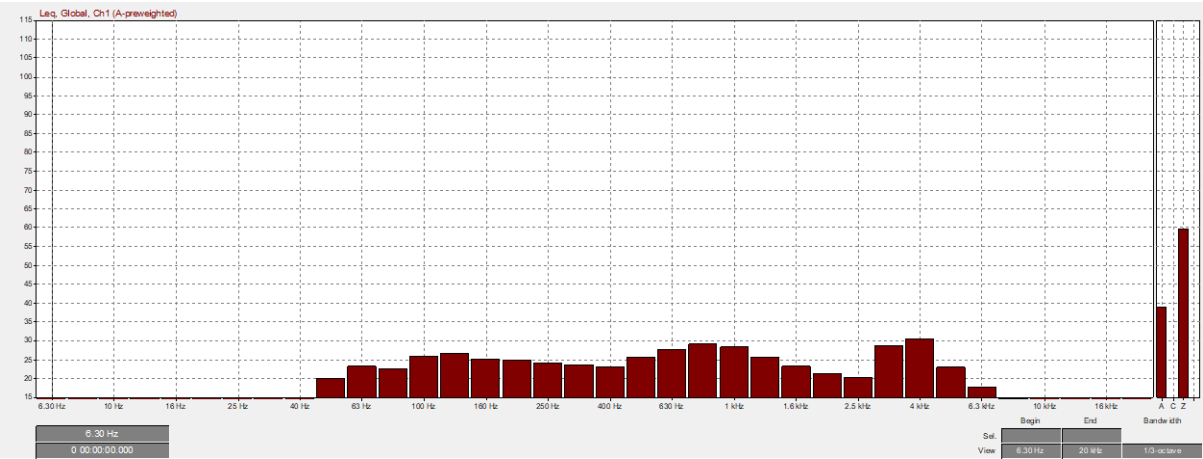
Daytime frequency content of measured sound (dB on left axis)



Night-time noise levels over time (dB on left axis)



Night-time frequency content of measured sound (dB on left axis)



Appendix 2 – Internal noise level calculations

Living room calculation

Noise break-in calculator								
R001126 - Carlton Road. 23rd April 2018								
Living room calculation								
Room volume (V)								
50								
Reverberation time (T)								
0.5								
Absorption area (A)								
16								
A0								
10								
Surface area glazing (m2)								
A0/S								
Swi/S								
Sew/S								
S								
4								
0.83								
0.33								
0.67								
12								
Surface area wall (m2)								
8								
Outside sound levels								
Hz								
63								
125								
250								
500								
1000								
2000								
4000								
64.2								
59.1								
52.6								
47.9								
51.5								
49.1								
45.4								
SRI's								
Hz								
63								
125								
250								
500								
1000								
2000								
4000								
22								
24								
26								
28								
35								
41								
47								
49								
47								
56								
66								
76								
35								
35								
35								
34								
36								
34								
34								
4-12-4 glazing								
brick/cavity/block								
non-acoustic								
Internal sound levels								
Hz								
63								
125								
250								
500								
1000								
2000								
4000								
dBA								
Total								
39.79								
32.90								
24.80								
19.06								
18.25								
16.39								
12.88								
A Weighted								
13.59								
16.80								
16.20								
15.86								
18.25								
17.59								
13.88								
25								

Bedroom calculation

Noise break-in calculator								
R001126 - Carlton Road. 23rd April 2018								
Bedroom calculation								
Room volume (V)								
30								
Reverberation time (T)								
0.3								
Absorption area (A)								
16								
A0								
10								
Surface area glazing (m2)								
A0/S								
Swi/S								
Sew/S								
S								
3								
1.04								
0.31								
0.69								
9.6								
Surface area wall (m2)								
6.6								
Outside sound levels								
Hz								
63								
125								
250								
500								
1000								
2000								
4000								
53.5								
47.5								
38.4								
33.7								
33								
25.4								
32.1								
SRI's								
Hz								
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35								
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35								
34								
36								
34								
34								
4-12-4 glazing								
brick/cavity/block								
non-acoustic								
Internal sound levels								
Hz								
63								
125								
250								
500								
1000								
2000								
4000								
dBA								
Total								
28.00								
20.29								
9.69								
4.14								
-0.63								
-7.39								
-0.55								
A Weighted								
1.80								
4.19								
1.09								
0.94								
-0.63								
-6.19								
0.45								
9								

Appendix 3 – Company Profile

Resonance Acoustics Ltd is part of The FES Construction Consultancy Group which was established in 2006 as a Building Surveying firm specialising in sustainable design and construction. Since then, the company has expanded and developed a nationwide footprint becoming one of the leading sustainability, on-site testing and Part L compliance consultancies in the UK. With offices in London and York we are a one stop dependable partner providing surveying and technical services for construction and renovation projects.

Our key services include:

Acoustic Design and Consultancy

Building Surveys

Design Services

Testing Services

Energy Strategy Studies

Compliance Assessments

EPC surveys and consultancy

Sustainability Consultancy

We work with a range of clients including national and regional house builders, PLC contractors, architects, M&E consultants, town planners and commercial developers. Our work varies from large scale well known projects to smaller more bespoke developments.

Bibliography

BS 8233:2014 Guidance on sound insulation and noise reduction for buildings. British Standards Institution 2014.

Guidelines for Community Noise. World Health Organisation, 1999.

PropPG: Planning & Noise. Professional Practice Guidance on Planning & Noise. ANC, IOA, CIEH, May 2017.