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**ALLBROOK WAY
EASTLEIGH**

NOISE ASSESSMENT

Technical Report: R10059-1 Rev 3

Date: 17th October 2024

For: Bargate Homes
The New Barn
Vicarage Farm Business Park
Winchester Road, Fair Oak
Hampshire
SO50 7HD

24 Acoustics Document Control Sheet

Project Title: Allbrook Way, Eastleigh - Noise Assessment

Report Ref: R10059-1 Rev 3

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For and on behalf of 24 Acoustics Ltd				

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1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been instructed by Bargate Homes to undertake a noise assessment at Allbrook Way, Eastleigh, Hampshire. 24 Acoustics Ltd has been instructed by Bargate Homes to undertake a noise assessment at Allbrook Way, Eastleigh, Hampshire. Outline planning consent has been granted for residential (reference O/19/86980) for up to 49 dwellings, associated access routes and residential amenity areas.
- 1.2 This report presents a noise assessment for the reserved matters application for the site to discharge condition 32 of the Outline planning consent.
- 1.3 This report has assessed noise from existing sources of ambient noise around the site, including road traffic using Allbrook Way, based on the latest proposals. This report has assessed noise from existing sources of ambient noise around the site, including road traffic using Allbrook Way, based on the latest proposals.
- 1.4 All noise levels in this report are quoted in dB relative to 20 μ Pa.

2.0 SITE DESCRIPTION

- 2.1 The site is located on Allbrook Road, Eastleigh. The site currently comprises grazing land and is bounded by a residential property, Westfield house.
- 2.2 Existing residential properties lie to the south/southwest of the development site on Knowle Hill, accessed via a roundabout located directly south of the site. An area of woodland lies to the west with the M3 further west, at a distance of approximately 640m from the centre of the site. Allbrook Way follows the eastern site boundary.
- 2.3 The reserved matters application seeks to construct 49 residential dwellings at the site, comprising a mixture of detached, semi-detached and terraced houses. The site will be accessed via Knowle Hill to the south with new access roadways proposed within the site.
- 2.4 Figure 1 shows an aerial image of the site and surroundings. Figure 2 shows the proposed site layout.

3.0 CRITERIA

Outline Planning Condition

- 3.1 The site has outline planning consent (O/19/86980) and contains the following noise related condition 32:

Condition 32 - "The first reserved matters application shall be accompanied by a further detailed assessment of existing and proposed noise sources and a detailed noise mitigation scheme (with measures to provide satisfactory noise standards internally and within private amenity space to include consideration of site and building layout, building construction, boundary treatments, glazing and mechanical ventilation). The design of the site, building layout and boundary treatments shall first be optimised for 'good acoustic design' to include for an open windows lifestyle where possible to comply with limits contained within BS8233: 2014 "Guidance on sound insulation and noise reduction for buildings". Where after including for such 'good acoustic design' there are residual noise impacts, building construction, glazing and mechanical ventilation shall be included for. The detailed noise mitigation scheme, as approved in writing by the Local Planning Authority, shall be implemented fully and verified as performing as required prior to the first occupation of each dwelling unit, and shall thereafter retained."

BS 8233:2014

- 3.2 BS 8233:2014 [Reference 1] provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB $L_{Aeq,16 \text{ hour}}$ in living rooms and bedrooms during the day, 40 dB $L_{Aeq, 16 \text{ hour}}$ in dining rooms during the day and 30 dB $L_{Aeq, 8 \text{ hour}}$ in bedrooms at night.
- 3.3 BS 8233 also notes that "Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{Amax,F_r} depending on the character and number of events per night."

- 3.4 Although the guidelines have no formal standing, the World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines [Reference 2] suggest internal night-time noise levels not exceeding 30 dB $L_{Aeq,8hr}$ or regularly (10 – 15 times per night) exceeding 45 dB $L_{Amax,f}$ for 'a good night's sleep'.
- 3.5 In relation to external noise, BS 8233 proposes desirable daytime levels of no greater than 50 to 55 dB $L_{Aeq,T}$ with an upper guideline value, but acknowledges that in many instances there will be circumstances where these guideline values are not achievable where development is desirable.

Summary

- 3.6 Based upon the review of standards described above, noise at proposed residential properties has been assessed in accordance with the following approach:
- BS 8233:2014 for interior noise levels (of 35 dB $L_{Aeq,16hr}$ in living rooms and 30 dB $L_{Aeq,8hr}$ in bedrooms).
 - A maximum night-time internal level of 45 dB $L_{Amax,f}$ for regular events (not exceeding 10 per night) should apply in bedrooms;

4.0 NOISE MEASUREMENTS

Instrumentation

- 4.1 An environmental noise survey was undertaken on site between 7th and 11th July 2023. The following instrumentation was used: The following instrumentation was used:
- 1 x Rion precision sound level meter Type NL-52;
 - 1 x Rion precision sound level meter Type NL-32;
 - Bruel and Kjaer acoustic calibrator Type 4231.

Procedure

- 4.2 Calibration of all instrumentation was checked before and on completion of the measurements and no drift in calibration level was observed. The calibration of all equipment is traceable to National Standards.
- 4.3 The weather throughout the survey period was generally dry with wind speeds less than 5 m/s. Some data for periods of inclement weather have been removed prior to analysis. Measurements were made in accordance with BS 7445:1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 3].
- 4.4 The noise monitors were fitted with environmental wind shields. The meters were configured to monitor in single minute sample periods and were set up to measure and store overall A-weighted statistical parameters including the L_{Aeq} , L_{A10} , L_{A90} , and $L_{Amax,f}$ sound pressure levels.
- 4.5 The measurement locations are described below and can be seen in Figure 1.
- Location 1 –at a height of approximately 1.5m above ground level;
 - Location 2 –at a height of approximately 1.5m above ground level.
- 4.6 The measured noise levels at Locations 1 and 2 (expressed as L_{Aeq} , L_{A90} and L_{Amax}) are shown graphically in Appendix B. The measured average (L_{eq}) data values have been combined to generate the overall 16-hour daytime and 8-hour night-time free field levels; these are shown in Tables 1 and 2 below. 24 Acoustics take the typical L_{Amax} value to be the 10th highest value.

Date and Time	Daytime Noise Level	Night-time Noise Level	
	dB L_{Aeq} , 16 hour	dB L_{Aeq} , 8 hour	dB Typical $L_{Amax,f}$
Fri 7 th July 2023	67	59	77
Sat 8 th July 2023	67	60	79
Sun 9 th July 2023	66	60	77
Mon 10 th July 2023	67	62	77
Tue 11 th July 2023	68	-	-
Representative	67	60	79

Table 1: Ambient Noise Levels at Measurement Location 1

Date and Time	Daytime Noise Level	Night-time Noise Level	
	dB LAeq, 16 hour	dB LAeq, 8 hour	dB Typical LAmax,f
Fri 7 th July 2023	68	60	77
Sat 8 th July 2023	67	58	76
Sun 9 th July 2023	66	61	78
Mon 10 th July 2023	68	63	78
Tue 11 th July 2023	68	-	-
Representative	68	60	78

Table 2: Ambient Noise Levels at Measurement Location 2

- 4.7 Note that that 24 Acoustics determines the typical night-time maximum noise level to be the tenth highest in this period.
- 4.8 The above values in Tables 1 and 2 were measured at the boundary of the site overlooking Allbrook Way and will be used to calibrate the noise model to predict noise levels further back into the site.
- 4.8 It was observed during the noise surveys that the main noise arising in the area is road traffic on Allbrook Way. Occasional contributions from aircraft associated with Southampton Airport was observed. The M3 motorway also contributed to measured levels.

5.0 ASSESSMENT

- 5.1 An acoustic model of the site has been developed to determine the noise levels across the site for the proposed development. The model has been produced using IMMI 30 noise mapping software and has used the propagation methodology of CRTN [Reference 4] which takes into account the effects of distance, geometric divergence, topography and acoustic screening.
- 5.2 The acoustic model has included the 1.8m high boundary close board garden fences which will enclose all gardens. The barriers should provide a minimum superficial weight of 10 kg/m² (e.g. close-boarded timber fence) with a minimum height of 1.8 m above local ground level. Solid brick walls would also be acceptable.

- 5.3 The results of the acoustic model are shown in Figures 3 and 4, for daytime (1.5m height) and night-time (4m height) periods respectively.

Internal Noise Levels

- 5.4 Using the results of the acoustic model, calculations have been undertaken to determine the glazing and ventilation requirements for the proposed residential properties to ensure that the noise levels inside the properties do not exceed 35 dB $L_{Aeq, 16 \text{ hour}}$ during the day and 30 dB $L_{Aeq, 8 \text{ hour}}$ at night (and also not regularly exceed 45 dB $L_{Amax, f}$ at night) from road traffic noise sources.
- 5.5 Calculations are based on layout, elevations and internal floor plans provided by Bargate Homes in October 2024.
- 5.6 All dwellings will be provided with continuous mechanical extract ventilation in conjunction with background ventilators. The ventilation systems should allow for adequate ventilation to meet background ventilation requirements as per Part F of the Building Regulations [Reference 4].
- 5.7 The calculations have identified minimum outline glazing and ventilation specifications for each façade at the development site. Specifications apply to all relevant habitable rooms on all floors. The specifications are described below and relevant Zone locations identified in Figure 5.
- 5.8 The window acoustic specifications are shown in Table 3.

Glazed Element	Minimum SRI (dB) per Octave Band Centre Frequency (Hz)					
	125	250	500	1k	2k	4k
Zone A Bedrooms and Living rooms	24	22	29	40	44	46
Zone B and C Bedrooms and Living Rooms	24	20	25	35	38	35

Table 3: Glazing Sound Insulation Performance

- 5.9 In making a comparison with the values in Table 3, it is important that the glazing figures used are the result of tests in accordance with ISO 10140, Part 2: 2010 and that the quoted minimum sound reduction specifications are met by the entire glazing system as a whole,

including frames, seals, any insulated panels and not just the glass. The requirements also apply to any external glazed doors to habitable rooms.

5.10 The following glazing configurations, if installed properly, would be capable of achieving the required sound reduction performance:

- Glazing Zone A: 4 mm glass: 12 mm cavity (minimum): 6.4 mm glass
Stadip Silence (minimum 34 dB R_w);
- Glazing Zone B: 4 mm glass: 12 mm cavity (minimum): 4 mm glass
(minimum 31 dB R_w).

5.11 The acoustic performance specifications for ventilators are shown in Table 4.

Ventilation	Minimum Acoustic Performance, $D_{n,e}$ (dB) per Octave Band (Hz)					
	125	250	500	1k	2k	4k
Zone A	38	37	35	40	42	45
Zone B	36	38	36	32	37	40
Zone C	23	26	29	30	33	33

Table 4: Ventilator Sound Insulation Performance

5.12 In making a comparison with the above vent specifications in Table 4, it is important that the figures used are the result of laboratory tests with the vent in the open position. Note that the stated minimum performance values assume two ventilator per habitable room. The specific ventilation requirements (e.g. equivalent free area etc.) should be confirmed by others.

5.13 For guidance, the following ventilators, if installed properly, would be capable of achieving the required sound reduction performance:

- Vent Type A: Acoustically attenuated trickle ventilator, overall performance 39 dB $D_{n,e,w}$. (e.g. Titon SF Xtra V75 / Std. Canopy)
- Vent Type B: Acoustically attenuated trickle ventilator, overall performance 35 dB $D_{n,e,w}$. (e.g. Titon SF Xtra V25 / Std. Canopy)
- Vent Type C: Standard trickle ventilator, overall performance 32 dB $D_{n,e,w}$.

- 5.14 The overall external wall construction should be designed to achieve a minimum overall sound insulation performance of 52 dB R_w .
- 5.15 Based on the above calculations it is considered that, with appropriate mitigation, internal noise levels within proposed properties will be acceptable as per condition 32.

External Noise Levels

- 5.16 Based on the results of the acoustic model, noise levels within external amenity areas will be below 55 dB $L_{Aeq, T}$ during daytime hours (07:00 to 23:00 hours) across the site with the proposed boundary fences around gardens.

6.0 CONCLUSIONS

- 6.1 24 Acoustics Ltd has been instructed by Bargate Homes to undertake a noise impact assessment at Allbrook Way, Eastleigh in support of a reserved matters planning application. The assessment has addressed the impact of noise from existing sources of ambient noise around the site.
- 6.2 Ambient noise surveys on site have been undertaken on site establish the existing road traffic noise levels during daytime and night-time periods. The noise impact assessment has been assessed based on the guidance in BS 8233: 2014.
- 6.3 It is considered that, with appropriate acoustically rated glazing and ventilation, noise within habitable rooms would comply with maximum internal levels of 35 dB $L_{Aeq, T}$ during the daytime, 30 dB $L_{Aeq, T}$ at night and 45 dB $L_{Amax, f}$ at night for regular events.
- 6.4 On the above basis, it is considered that the noise impact at the proposed development site will be capable of achieving acceptable levels within the proposed residential properties and associated external amenity areas therefore condition 32 should be discharged.

REFERENCES

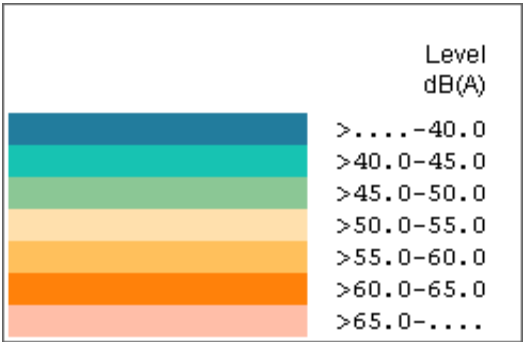
1. British Standards Institution. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings, 2014.
2. World Health Organisation. Guidelines for Community Noise, 2000.
3. British Standards Institution. British Standard 7445: 1991 'Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use'
4. Calculations of Road Traffic Noise, Department of Transport, 1988.
5. Building Regulations. Approved Document F - Ventilation, 2022.



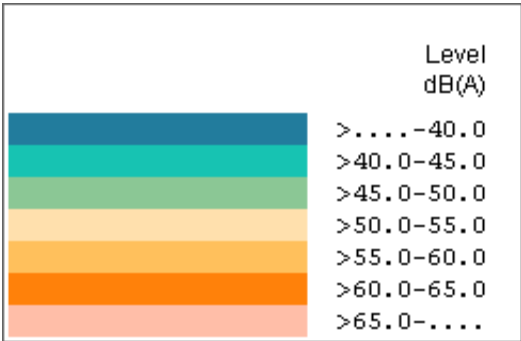
Project: Allbrook Way Eastleigh	Description: Site Boundary and Noise Monitoring Locations		 24Acoustics www.24acoustics.co.uk
DWG No: Figure 1	Scale: N.T.S.	Rev: 1	
Date: October 2024	Drawn By: AP	Job No: 10059	



Project: Allbrook Way Eastleigh	Description: Site Layout Plan		
DWG No: Figure 2	Scale: N.T.S.	Rev: 1	
Date: October 2024	Drawn By: AP	Job No: 10059	



Project: Allbrook Way Eastleigh		Description: Noise Contours, Daytime $L_{Aeq,16hr}$ (1.5 m height)		 24Acoustics www.24acoustics.co.uk
DWG No: Figure 3		Scale: N.T.S.	Rev: 1	
Date: October 2024		Drawn By: AP	Job No: 10059	



Project: Allbrook Way Eastleigh	Description: Noise Contours, Night-time L_{Aeq} , 8 hour (4m height)		 24Acoustics www.24acoustics.co.uk
DWG No: Figure 4	Scale: N.T.S.	Rev: 1	
Date: October 2024	Drawn By: AP	Job No: 10059	



APPENDIX A – ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

- i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

- ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, T , has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

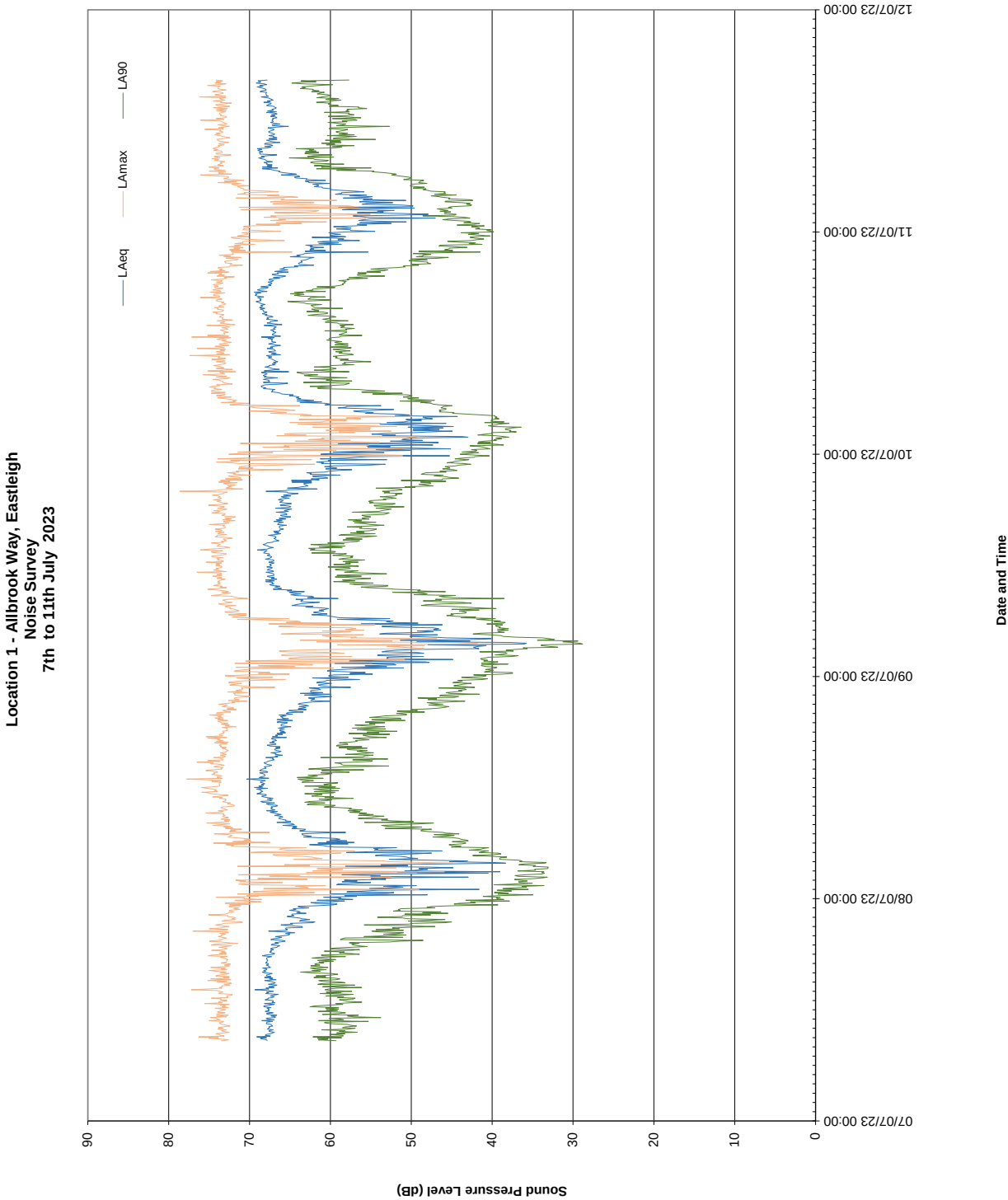
iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – ENVIRONMENTAL NOISE SURVEY RESULTS



Location 2 - Allbrook Way, Eastleigh
Noise Survey
7th to 11th July 2023

