

ENVIRONMENT

Avant Homes

Calver Lane,
Dodworth

Noise Impact Assessment

LDP2520

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Calver Lane, Dodworth

Noise Impact Assessment

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EXECUTIVE SUMMARY

BWB Consulting has been instructed by Avant Homes to undertake a Noise Impact Assessment for proposed residential development on a parcel of vacant land on the outskirts of Dodworth, Barnsley.

The assessment draws on the results of a baseline noise survey on the Site and has been undertaken in accordance with relevant standards and guidance.

Based on the measured noise levels at the site it is predicted that noise levels in external amenity spaces across the development will meet the desirable guideline values from the relevant British Standard, and that suitable internal noise levels will be achieved in internal habitable spaces with windows open.

Based on the findings of this assessment, it is considered that noise need not be a determining factor in granting planning consent for the development.

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1. INTRODUCTION

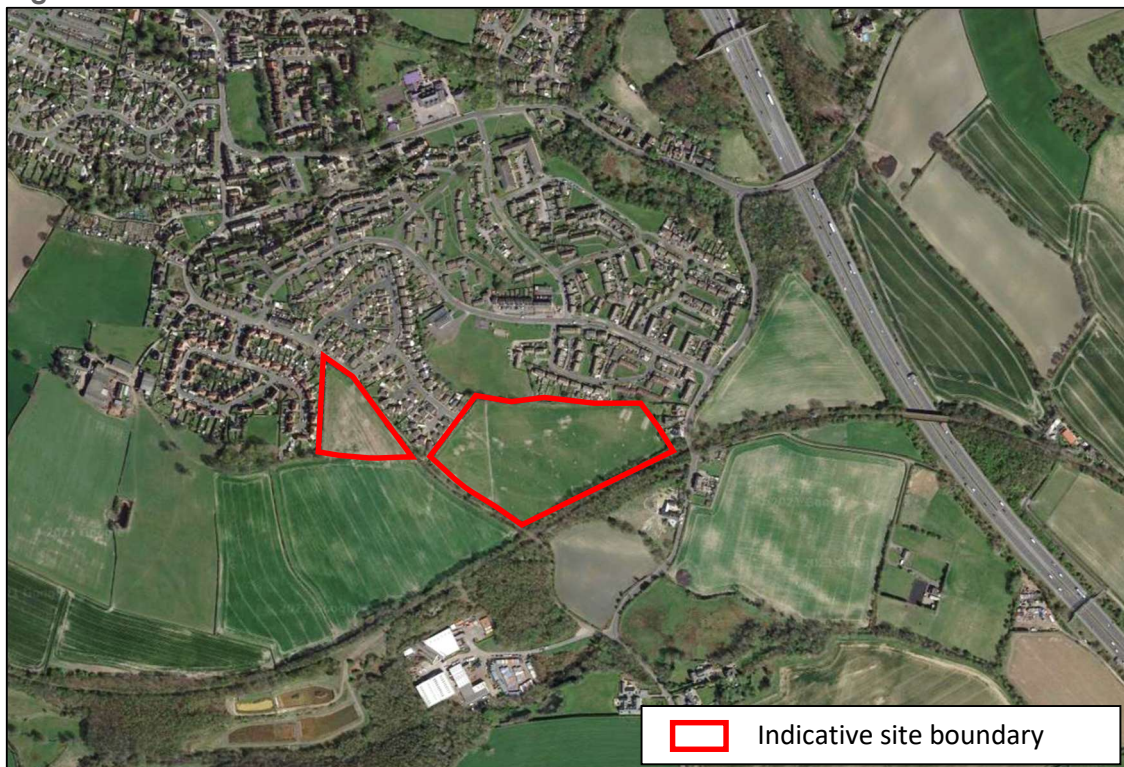
Appointment & Background

- 1.1 BWB Consulting (BWB) has been instructed by Avant Homes to undertake a Noise Impact Assessment to support a planning application for a proposed residential development in Dodworth, Barnsley.
- 1.2 The assessment draws on the results of a baseline noise survey undertaken at the Site and has been undertaken in accordance with relevant standards and guidance.
- 1.3 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix A**.

Site Location and Layout

- 1.4 The development site comprises two separate parcels of land approximately 1 km south east of Dodworth, Barnsley. Although the Site comprises two parcels of land, there is only a 25 metres separation distance between them at the closest point and most of the intervening ground is occupied by existing residential dwellings.
- 1.5 Due to the dominant noise sources and the surrounding land being the same for both parcels, and the separation distance being minimal, for the purposes of this assessment the two parcels have been considered as a single site. The site location is shown in **Figure 1.1**.

Figure 1.1: Site Location

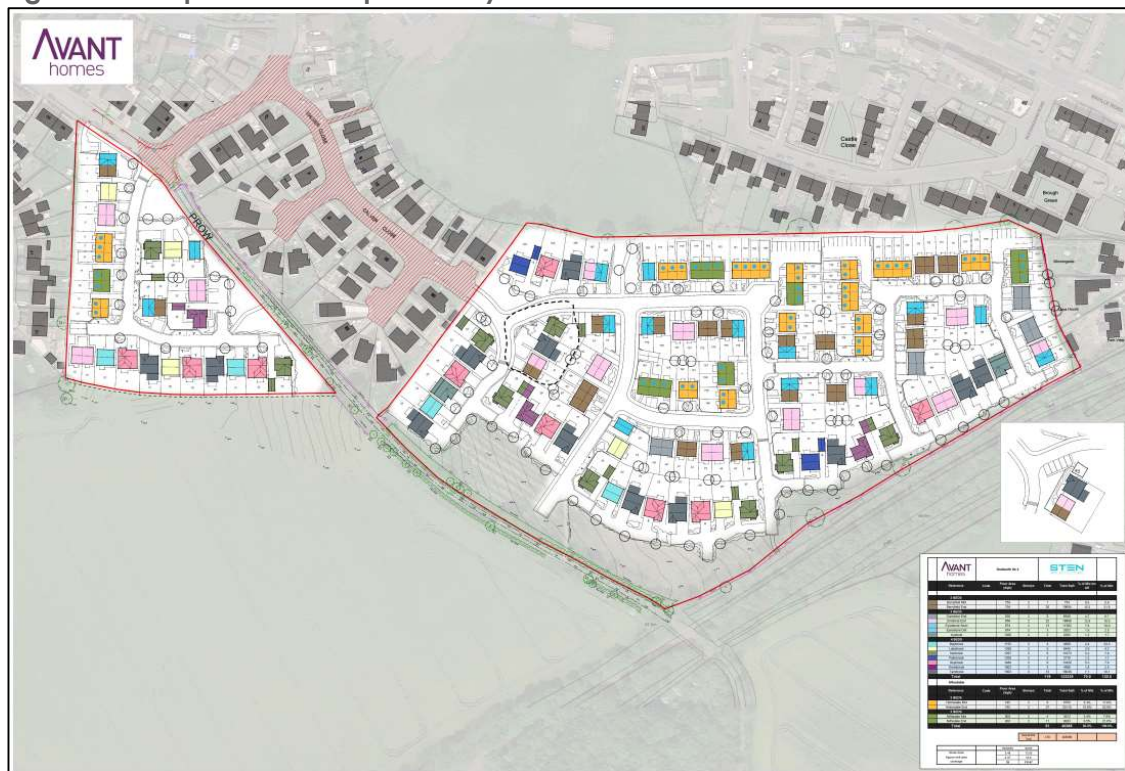


- 1.6 The site is adjacent to existing residential dwellings (Calver Close and Intake Crescent) along the northern boundary, to the south is open farm land and the Trans Pennine Trail which runs adjacent to the south eastern site boundary. The M1 motorway is located approximately 350 metres to the east of the site, with the intervening ground comprising open farm land.

Proposed Development

- 1.7 The proposed residential development comprises a mixture of 2, 3 and 4 bed houses, totaling 170 units. The proposed development layout is shown in **Figure 1.2**.

Figure 1.2: Proposed Development Layout



2. STANDARDS AND GUIDANCE

BS 8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings

- 2.1 This Standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use.
- 2.2 The Standard includes recommended internal and external noise level criteria which are applicable to dwellings for steady external noise sources. It is stated that it is desirable that the internal ambient noise level does not exceed the guideline values presented in **Table 2.1**.

Table 2.1: Desirable Guideline Noise Level Values from BS 8233

Activity	Location	Period	
		Daytime (07:00 - 23:00)	Night-time (23:00 - 07:00)
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

- 2.3 Whilst BS 8233 recognises that a guideline value may be set in terms of SEL or L_{AFmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated.
- 2.4 It is common practice to adopt 45 dB L_{AFmax} as a criterion for typical events at night, based on the guidance from the World Health Organisation (WHO) *Guidelines for Community Noise 1999* and *Environmental Noise Guidelines for the European Region 2018*. Therefore, this criterion has been adopted for this assessment.
- 2.5 With respect to external amenity space such as gardens and patios, it is stated as desirable that the noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres, other urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

3. BASELINE NOISE SURVEY

Summary

- 3.1 A baseline noise survey has been undertaken to determine the noise environment on the Site. Baseline noise monitoring was undertaken at a single measurement location shown (MP1) as shown in **Figure 3.1**.

Figure 3.1: Baseline Noise Survey Measurement Location



Survey Methodology

- 3.2 Noise monitoring was undertaken at Measurement Location 1 (ML1) over a 24-hour period commencing at 18:00 on 2nd November 2021. The microphone was located in free field conditions approximately 2 metres above local ground level.
- 3.3 ML1 was selected on account of it being the closest point of the site to the M1 (dominant noise source), thereby representing of a worst case location for noise levels experienced by receptors across the site. Noise levels further west into the site are expected to be equal or lower than those measured at ML1 due to the increased distance to the M1, and also due to the topography of the site which generally slopes away slightly to the south west.
- 3.4 The noise climate across the site was noted to be dominated by distant road traffic on the M1 motorway, with very few other noise sources contributing to the overall noise environment.

Measurement Equipment

- 3.5 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in **Table 3.1**. The equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meters, pre-amplifiers and microphones were calibrated to traceable standards within the 24 months prior to the measurements. The portable calibrators were calibrated within the 12 months preceding the date of the survey.

Table 3.1: Noise Measurement Equipment

Equipment	Make and Model	Serial Number	Calibration Due Date
Sound Level Meter	01 dB Fusion	11327	18/06/2021
Microphone	Grass 40CE	259479	
Pre-amplifier	01 dB PRE 22	1605201	
Calibrator	01dB-Stell Cal 21	34675335	19/11/2021

Weather Conditions

- 3.6 The weather during the noise survey was conducive to environmental noise measurement, it being dry with negligible winds (<5 ms⁻¹).

Measurement Results

- 3.7 A summary of the measured levels is provided in **Table 3.2**. Full measurement results are included in **Appendix B**.

Table 3.2: Summary of Measured Sound Pressure Levels at ML1

Start Date and Time	Period	dB L _A F _{max}	dB L _A eq,T	dB L _A 90,T
02/11/2021 18:00	Daytime ¹ (07:00 – 23:00)	-	47	45 ²
02/11/2021 23:00	Night-time (23:00 – 07:00)	56 ³	44	38 ²

¹ Includes periods between 18:00 and 23:00 on 2nd Nov and between 07:00 and 18:00 on 3rd Nov 2021.
² Taken to be the mean of measured L_A90,15min values.
³ 10th highest discrete event measured during night-time.

4. ASSESSMENT

- 4.1 It can be seen from **Table 3.2** that daytime noise levels ($L_{Aeq,16h}$) on the site are below the 50 dB desirable guideline value from BS 8233. Therefore, external noise levels across the site are predicted to be desirable in all external amenity areas.
- 4.2 Internal noise levels within the proposed dwellings can be estimated by applying a correction of -15 dB to the external free-field noise levels, which assumes that the façade of the building includes a partially open window for ventilation and / or comfort cooling. Applying this correction to the noise levels in **Table 3.2**, the predicted internal noise levels with partially open windows, based on the current noise environment, are shown in **Table 4.1**.

Table 4.1: Predicted Internal Noise Levels with Partially Open Windows

Period	dB L_{AFmax}	dB $L_{Aeq,T}$
Daytime (07:00 – 23:00)	-	32
Night-time (23:00 – 07:00)	41	29

- 4.3 It can be seen from **Table 4.1** that the desirable internal guideline values from BS 8233, as detailed in **Table 2.1**, are predicted to be achieved within the proposed dwellings with partially open windows based on the current noise environment on the site. The 45 dB L_{AFmax} criterion from the WHO Guidelines is also predicted to be achieved.
- 4.4 Given that all relevant criteria are predicted to be achieved, consideration of further mitigation measures at the site to protect future residents from excessive noise levels is unwarranted.

5. CONCLUSION

- 5.1 BWB Consulting (BWB) has been instructed by Avant Homes to undertake a Noise Impact Assessment to support a planning application for a residential development on land to the south east of Dodworth, Barnsley.
- 5.2 The assessment draws upon the results of a baseline noise survey undertaken at the Site and has been undertaken in accordance with relevant standards and guidance.
- 5.3 The survey results indicate that current noise levels on the site will result in desirable external noise levels being achieved in external amenity spaces across the development and desirable internal noise levels being achieved in internal spaces with windows open.
- 5.4 Based on the findings of this assessment, noise need not be a determining factor in granting planning consent for the development.

APPENDICES

APPENDIX A: Glossary of Terms

Term	Descriptions
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20 μ Pa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds S1 and S2 is given by 20 log ₁₀ (S1 / S2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20 μ Pa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
L _{eq,T}	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L _{max,T}	A noise level index defined as the maximum noise level during the period T. L _{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L _{90,T}	A noise level index. The noise level exceeded for 90% of the time over the period T. L ₉₀ can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m.
Façade	At a distance of 1 m in front of a large sound reflecting object such as a building façade.
Fast/Slow Time Weighting	Averaging times used in sound level metres.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.

APPENDIX B: Full Survey Results

Table B-1: Noise Levels at Measurement Location 1

Start date & time	Duration	L _A F _{max}	L _A eq	L _A 10	L _A 90
11/02/2021 18:00	15-minutes	61.7	44.0	44.6	40.4
11/02/2021 18:15	15-minutes	57.3	44.2	45.2	41.6
11/02/2021 18:30	15-minutes	53.6	44.2	45.1	42.7
11/02/2021 18:45	15-minutes	47.8	43.6	44.6	42.4
11/02/2021 19:00	15-minutes	61.6	45.2	45.4	40.1
11/02/2021 19:15	15-minutes	46.6	41.2	42.9	39.1
11/02/2021 19:30	15-minutes	56.0	43.3	44.5	40.9
11/02/2021 19:45	15-minutes	47.1	43.3	44.5	41.5
11/02/2021 20:00	15-minutes	50.8	43.6	44.8	41.7
11/02/2021 20:15	15-minutes	47.8	42.8	44.2	40.5
11/02/2021 20:30	15-minutes	45.4	41.4	42.6	39.7
11/02/2021 20:45	15-minutes	73.3	45.9	42.9	39.0
11/02/2021 21:00	15-minutes	51.7	42.0	43.3	40.1
11/02/2021 21:15	15-minutes	47.8	42.6	43.8	40.9
11/02/2021 21:30	15-minutes	48.1	43.0	44.4	40.7
11/02/2021 21:45	15-minutes	53.6	44.2	45.4	42.5
11/02/2021 22:00	15-minutes	50.9	43.2	44.7	41.1
11/02/2021 22:15	15-minutes	46.6	43.2	44.3	41.7
11/02/2021 22:30	15-minutes	45.3	42.5	43.5	41.0
11/02/2021 22:45	15-minutes	46.4	42.2	43.3	40.7
11/02/2021 23:00	15-minutes	46.5	42.1	43.0	40.8
11/02/2021 23:15	15-minutes	48.4	41.4	42.3	39.9
11/02/2021 23:30	15-minutes	52.7	40.7	41.8	38.6
11/02/2021 23:45	15-minutes	42.8	39.3	40.6	37.6
11/03/2021 00:00	15-minutes	49.1	40.2	41.3	38.3
11/03/2021 00:15	15-minutes	49.9	40.3	41.7	38.2
11/03/2021 00:30	15-minutes	49.6	41.1	42.6	38.8
11/03/2021 00:45	15-minutes	46.0	39.9	41.4	37.8
11/03/2021 01:00	15-minutes	45.9	40.0	41.5	37.3
11/03/2021 01:15	15-minutes	45.2	39.7	41.0	37.4
11/03/2021 01:30	15-minutes	47.2	40.8	42.3	38.7
11/03/2021 01:45	15-minutes	45.2	38.8	40.7	36.2
11/03/2021 02:00	15-minutes	42.8	38.1	39.6	36.0
11/03/2021 02:15	15-minutes	48.8	39.0	40.5	36.1
11/03/2021 02:30	15-minutes	45.8	38.4	40.4	35.3
11/03/2021 02:45	15-minutes	44.7	38.3	40.4	34.7
11/03/2021 03:00	15-minutes	46.0	38.9	41.0	35.6
11/03/2021 03:15	15-minutes	44.1	39.3	41.1	36.5
11/03/2021 03:30	15-minutes	43.5	37.9	39.3	35.7
11/03/2021 03:45	15-minutes	47.8	37.7	39.3	35.2
11/03/2021 04:00	15-minutes	47.2	38.3	40.1	35.9
11/03/2021 04:15	15-minutes	43.2	38.6	40.1	36.3

Start date & time	Duration	L _{AFmax}	L _{Aeq}	L _{A10}	L _{A90}
11/03/2021 04:30	15-minutes	66.9	42.9	41.7	37.9
11/03/2021 04:45	15-minutes	47.7	39.5	40.7	37.6
11/03/2021 05:00	15-minutes	44.6	40.2	41.5	38.4
11/03/2021 05:15	15-minutes	49.2	41.4	42.5	39.6
11/03/2021 05:30	15-minutes	66.8	46.6	44.4	40.5
11/03/2021 05:45	15-minutes	56.2	42.0	43.1	40.0
11/03/2021 06:00	15-minutes	57.3	45.6	45.4	42.6
11/03/2021 06:15	15-minutes	51.2	46.2	47.4	44.2
11/03/2021 06:30	15-minutes	71.5	54.2	49.4	45.7
11/03/2021 06:45	15-minutes	67.4	48.9	48.8	46.4
11/03/2021 07:00	15-minutes	71.1	51.4	49.9	48.1
11/03/2021 07:15	15-minutes	60.5	49.5	50.6	48.0
11/03/2021 07:30	15-minutes	54.1	49.7	50.7	48.3
11/03/2021 07:45	15-minutes	69.8	51.3	50.4	48.0
11/03/2021 08:00	15-minutes	70.3	51.2	51.0	48.1
11/03/2021 08:15	15-minutes	54.4	48.8	49.8	47.5
11/03/2021 08:30	15-minutes	51.7	48.9	49.9	47.6
11/03/2021 08:45	15-minutes	53.7	48.3	49.3	46.7
11/03/2021 09:00	15-minutes	59.2	47.9	48.9	46.4
11/03/2021 09:15	15-minutes	54.8	47.6	48.7	46.0
11/03/2021 09:30	15-minutes	70.3	47.5	47.2	44.7
11/03/2021 09:45	15-minutes	51.0	46.2	47.4	44.6
11/03/2021 10:00	15-minutes	60.6	47.2	47.9	44.9
11/03/2021 10:15	15-minutes	66.6	46.9	47.7	44.2
11/03/2021 10:30	15-minutes	57.0	46.5	47.7	44.4
11/03/2021 10:45	15-minutes	55.5	46.9	48.2	44.8
11/03/2021 11:00	15-minutes	51.9	47.2	48.4	45.5
11/03/2021 11:15	15-minutes	53.4	47.0	48.3	45.5
11/03/2021 11:30	15-minutes	49.8	46.2	47.7	44.2
11/03/2021 11:45	15-minutes	53.7	47.1	48.2	45.3
11/03/2021 12:00	15-minutes	52.6	46.9	48.3	44.9
11/03/2021 12:15	15-minutes	52.8	48.9	50	47.3
11/03/2021 12:30	15-minutes	59.8	47.6	48.3	46.2
11/03/2021 12:45	15-minutes	61.8	49.0	50.4	46.8
11/03/2021 13:00	15-minutes	52.8	46.3	47.7	44.5
11/03/2021 13:15	15-minutes	59.4	48.4	49.9	46.2
11/03/2021 13:30	15-minutes	51.0	47.7	48.9	46.0
11/03/2021 13:45	15-minutes	51.8	46.8	47.9	45.3
11/03/2021 14:00	15-minutes	52.6	48.6	49.9	46.5
11/03/2021 14:15	15-minutes	55.4	47.9	49.1	45.5
11/03/2021 14:30	15-minutes	55.7	47.0	48.1	45.6
11/03/2021 14:45	15-minutes	51.5	48.1	49.2	46.5
11/03/2021 15:00	15-minutes	52.3	48.7	49.7	47.5

Start date & time	Duration	L _{AFmax}	L _{Aeq}	L _{A10}	L _{A90}
11/03/2021 15:15	15-minutes	52.0	48.3	49.5	46.7
11/03/2021 15:30	15-minutes	56.1	48.6	49.8	47.0
11/03/2021 15:45	15-minutes	52.2	48.4	49.4	46.9
11/03/2021 16:00	15-minutes	57.5	49.1	50.2	47.3
11/03/2021 16:15	15-minutes	66.2	50.4	51.1	48.3
11/03/2021 16:30	15-minutes	57.6	49.8	51.1	48.1
11/03/2021 16:45	15-minutes	53.8	49.1	50.4	47.5
11/03/2021 17:00	15-minutes	66.8	50.2	50.1	47.4
11/03/2021 17:15	15-minutes	52.8	48.5	49.4	47.1
11/03/2021 17:30	15-minutes	53.9	48.5	49.6	47.0
11/03/2021 17:45	15-minutes	54.0	48.4	49.6	46.7

