

## HOLMER HOUSE FARM

### NOISE TECHNICAL NOTE

<b>Project</b>	Holmer House Farm, Holmer, Hereford		
<b>Document Number</b>	BMW2764/TN/MJB001	<b>BWB Ref</b>	BMW2764
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### 184662 - Holmer House Farm, Holmer – Noise

This technical note summarises the detailed assessment work undertaken in support of an application to discharge Planning Condition No. 17 relating to noise, attached to the hybrid planning permission for residential development at the above-mentioned site location.

#### Introduction

- 1.1 Planning permission was granted on 8<sup>th</sup> January 2019 subject to a number of planning conditions. Planning Condition No. 17 states:

*“17 The reserved matters submission relating to layout, appearance and landscaping for residential development (or phase) submitted pursuant to Condition 3 shall be accompanied by details of a scheme of noise attenuating measures for the proposed dwellings relating to the road traffic noise from the A49.*

*The scheme shall have reference to the most recent and relevant Pro PG Planning and Noise guidance, advice provided by BS 8233:2014, Guidance on sound insulation and noise reduction in buildings (or any subsequent guidance) and the World Health Organisation Guidelines for Community Noise.*

*The approved scheme shall be implemented before the first occupation or use of the dwellings within this phase of the development and thereafter be maintained as such.*

*Reason: To ensure that the preparation of the Reserved Matter in respect of layout and appearance take into account any required noise mitigation from design stages in the interests of the residential amenity of future residents and to ensure visual impacts of any mitigation are addressed in accordance with Policy SD1 of the Herefordshire Local Plan – Core Strategy, NDP and the National Planning Policy Framework.”*

- 1.2 The following sections set out the relevant standards and guidance, along with the results of a noise modelling exercise and subsequent assessment of road traffic noise from the A49.

## Standards & Guidance

### BS 8233:2014: Guidance on Sound Insulation And Noise Reduction For Buildings

- 1.3 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, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.
- 1.4 The guidance provided includes appropriate 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 following criteria set out in **Table 1**.

**Table 1: Summary of Internal Ambient Noise Levels to be achieved in Habitable Rooms when Assessed in Accordance with BS 8233**

Activity	Location	Period	
		07:00 to 23:00 Hours, i.e. Daytime	23:00 to 07:00 Hours, i.e. Night-time
Resting	Living Room	35 dB L <sub>Aeq</sub> , 16 Hour	-
Dining	Dining Room/area	40 dB L <sub>Aeq</sub> , 16 Hour	-
Sleeping (daytime resting)	Bedroom	35 dB L <sub>Aeq</sub> , 16 Hour	30 dB L <sub>Aeq</sub> , 8 Hour

- 1.5 Whilst BS 8233:2014 recognises that a guideline value may be set in terms of SEL or L<sub>AFmax</sub> for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: Guidelines for Community Noise.
- 1.6 With respect to external amenity space such as gardens and patios it is stated that it is desirable that the noise level does not exceed 50 dB L<sub>Aeq,T</sub>, with an upper guideline value of 55 dB L<sub>Aeq,T</sub> 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 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.

### World Health Organisation (WHO) 1999: Guidelines for Community Noise

- 1.7 The World Health Organisation (WHO) guidance: 1999: Guidelines for community noise draws upon guidance from Vallet and Vernay, which states:

*“For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L<sub>AFmax</sub> more than 10-15 times per night”*

### Professional Practice Guidance on Planning & Noise – New Residential Development (ProPG)

- 1.8 The ProPG document was published in May 2017 and is intended to provide practitioners with guidance on a recommended approach to the management of

noise within the planning system in England. The guidance only relates to new residential development affected by transportation noise sources such as road, rail and air traffic.

- 1.9 The document was jointly published by the Association of Noise Consultants, the Institute of Acoustics and the Chartered Institute of Environmental Health. It is recognised in the document that whilst current Government planning and noise policy and guidance sets clear objectives it does not prescribe specific numerical acoustics standards for acceptable noise levels at or in dwellings.
- 1.10 The ProPG is spread over three documents. The main document and two supplementary documents. The main document presents planning guidance, the first supplementary document details a summary of extant and superseded noise related planning policy and guidance and the second supplementary document describes what is meant by Good Acoustic Design.
- 1.11 The main document recommends a two-stage approach to assessment. The first stage of the assessment approach is an Initial Site Risk Assessment which looks at external noise levels at a potential development site and gives a broad indication of the risk an adverse effect on future residents. Where noise levels are above the point at which 'no adverse effect' is indicated, the assessment moves on to the second stage. Where noise levels on the site are below this level, it is advised that the 'application need not normally be delayed on noise grounds'.
- 1.12 At the second stage, a full assessment is undertaken, which covers four elements:
  - Good Acoustic Design Process;
  - Internal Noise Level Guidelines;
  - External Amenity Area Noise Assessment; and
  - Assessment of Other Relevant Issues.
- 1.13 It is suggested that results of the assessment are detailed within an acoustic design statement, which will inform the recommendation of the environmental health officer to the decision maker, the planning officer.
- 1.14 This assessment has followed the general approach in the document by considering appropriate Good Acoustic Design principles, such as considering noise barriers to control road traffic noise levels for future residents. The assessment also considered internal and external noise level criteria, as required by the second stage of the assessment approach.

## **Noise Modelling**

- 1.15 In order to identify the acoustic treatment requirements to satisfy Condition No. 17, the previous noise modelling exercise undertaken in support of the planning submission has been revisited and updated in light of the final layout.
  - The noise model was set up to apply the noise prediction methodology set out in ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation;

- Mapping of the Site and the surrounding area was calibrated into the noise model based on known Ordinance Survey grid reference points;
  - Indicative ground topography was approximated using the LIDAR Composite 2m DTM information freely available from the data.gov website;
  - Ground absorption was set to  $G = 0.5$  (50% acoustically reflective ground)
  - The model was set to include second order reflected noise from solid structures.
- 1.16 The noise model has been used to predict the resultant noise levels in gardens during the daytime, and noise levels incident at facades during the daytime and night-time periods.
- 1.17 Although the baseline noise measurements on which the model is based were carried out in 2017, it is considered that these levels continue to be representative of the current noise environment.
- 1.18 **Figure 1** and **Figure 2** of **Appendix A** show the daytime and night-time noises levels across the site respectively.

### Assessment of acoustic barrier requirements

- 1.19 In order to control daytime road traffic noise from the A49 in proposed gardens, the following mitigation measures have been determined:
- 2.8m acoustic fence along the northern area of the eastern boundary; and
  - 1.8m high acoustic fence along the southern area of the eastern boundary.
- 1.20 It is understood that the existing treeline located alongside the proposed 2.8m fencing is to be removed. However, it is considered that no additional noise mitigation will be required following the loss of trees.
- 1.21 **Figure 3** of **Appendix A** shows the resultant daytime 16-hour noise levels from the A49 with the inclusion of the acoustic fencing. The noise contour plot shows that, at 1.5m above local ground height, the 55 dB  $L_{Aeq,16h}$  garden limit set out in Condition No. 17 will be achieved in all remaining gardens without further need for acoustic screening.
- 1.22 The acoustic barriers should be continuous, with no gaps and a suitable gravel board or similar at the foot of the barrier to mitigate against any sound leaking under the barrier. The barriers should have a minimum surface density of 15kg/m<sup>2</sup> and it is advised that a specialist fencing supplier provides and installs the acoustic fencing to ensure performance and integrity of the barriers.

### Assessment of façade insulation requirements

- 1.23 Based on the standards and guidance set out in Condition No. 17, the following criteria are to be met internally:
- Daytime: Living rooms/Studies/Bedrooms - 35 dB  $L_{Aeq,16hr}$ ; and
  - Night-time: Bedrooms - 30 dB  $L_{Aeq,8hr}$  and 45 dB  $L_{AFmax}$ .

- 1.24 In order to identify the performance requirements for each building, noise break-in calculations have been completed in accordance with the rigorous method from BS 8233:2014, using typical room dimensions (width of 4m, depth of 3.5m, height of 2.5m) and 25% glazed openings. A reverberation time of 0.5s, with low frequency corrections, has been adopted for all rooms assessed. It has been assumed that living rooms/studies will require passive ventilation with an effective free area of 8,000mm<sup>2</sup> and that bedrooms will require 4,000mm<sup>2</sup>. Should a larger area be required, specifications may need to be revised in order to compensate for any additional noise break-in through the larger area.
- 1.25 **Table 2** below shows the proposed glazing and ventilation specifications, and **Figure 4** of **Appendix B 2** shows the daytime Internal Noise Assessment for each façade. **Figure 5** shows that the requirements for night-time noise are not above and beyond the requirements for daytime, and as such, the measures recommended for daytime are also considered sufficient for bedrooms at night-time.

**Table 2: Glazing and ventilation requirements**

Zone	Minimum sound reduction performance specification		Example configurations
	Windows (dB, $R_w + C_{tr}$ )	Ventilators (dB, $D_{n,e,w} + C_{tr}$ )	
Blue	30	44	<ul style="list-style-type: none"> <li>4mm/12mm/10mm standard thermal double glazing.</li> <li>Acoustically attenuated airbrick/through wall vent (e.g. Greenwood AAB-4000)</li> </ul>
Green	25	33	<ul style="list-style-type: none"> <li>4mm/6-16mm/4mm standard thermal double glazing.</li> <li>Hit-and-miss trickle vent (e.g. Greenwood 5000EA)</li> </ul>

- 1.26 It should be noted that units associated with the adjacent development intervene the A49 and units to the west of the site. Considering this, mitigation measures at this location would no longer be required, and therefore, **Appendix C** summarises the units requiring mitigation.
- 1.27 The octave band spectral performance of the products used above are provided in **Appendix D**. Should another product be used, it must provide the minimum octave band performance set out in the appendix. The above presents solutions to satisfy the proposed internal ambient noise limits within habitable rooms during normal ventilation conditions to meet Part F minimum ventilation.

## Conclusion

- 1.28 Based on the information provided above, it is considered that there is sufficient information provided to allow the discharge of Planning Condition No. 17 on the scheme and I would be grateful if you could confirm this.

1.29 Should you require any further information please contact me.

Yours sincerely

**Michaela Moffatt**

Senior Acoustic Consultant | BWB Consulting Limited

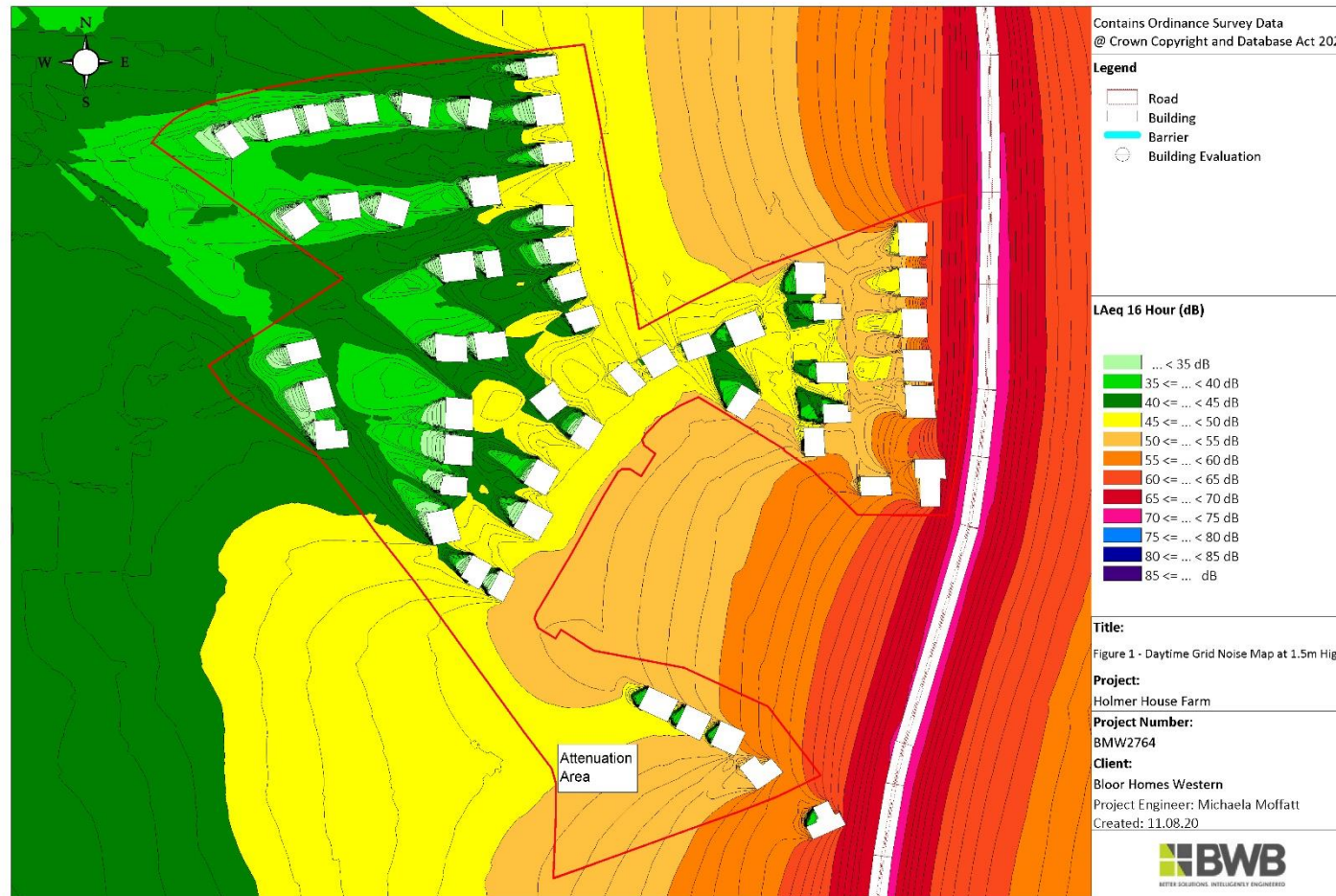
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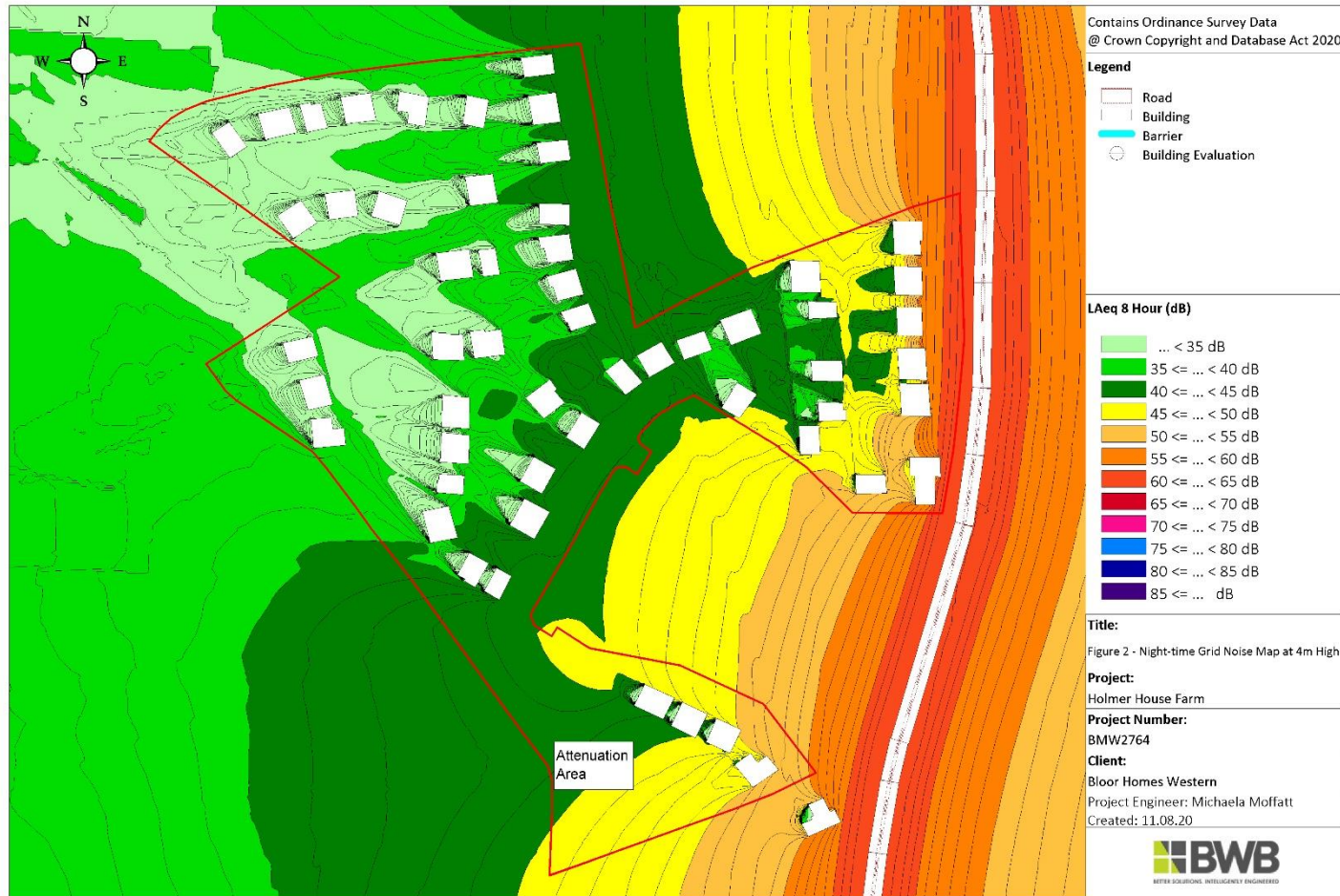
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Appendix A	Noise Models
Appendix B	Internal Noise Assessment
Appendix C	Glazing and Ventilation Requirements
Appendix D	Glazing and Ventilation Product Octave Band Performance

## Appendix A: Noise Models









## Appendix B: Internal Noise Assessment







**Appendix C: Glazing and Ventilation Requirements**



Zone	Minimum sound reduction performance specification		Example configurations
	Windows (dB, $R_w + C_{tr}$ )	Ventilators (dB, $D_{n,e,w} + C_{tr}$ )	
Blue	30	44	<ul style="list-style-type: none"><li>4mm/12mm/10mm standard thermal double glazing.</li><li>Acoustically attenuated airbrick/through wall vent (e.g. Greenwood AAB-4000)</li></ul>
Green	25	33	<ul style="list-style-type: none"><li>4mm/6-16mm/4mm standard thermal double glazing.</li><li>Hit-and-miss trickle vent (e.g. Greenwood 5000EA)</li></ul>

## Appendix D: Glazing and Ventilation Product Octave Band Performance

### Glazing Product Specification, dB

Product	125	250	500	1000	2000	4000	R <sub>w</sub>	C <sub>tr</sub>	R <sub>w</sub> + C <sub>tr</sub>
4mm/12mm/4mm	21	17	25	35	37	31	29	-4	25
4mm/12mm/10mm	24	21	32	37	42	43	35	-5	30

### Ventilation Product Specification, dB

Product	125	250	500	1000	2000	4000	D <sub>n,e,w</sub>	C <sub>tr</sub>	D <sub>n,e,w</sub> + C <sub>tr</sub>
Greenwood 5000EA	39.5	37.3	35.5	32.0	31.0	33.5	33	0	33
Greenwood AAB-4000	34.7	42.4	41.3	47.5	50.5	50.5	44	0	44