A CAF GROUP COMPANY

ADVISORY

Taylor Wimpey UK Limited
Markfield
Leicestershire
Noise Impact Assessment

255390

www.bwbconsulting.com

ADVISORY

Taylor Wimpey UK Limited
Markfield
Leicester
Noise Impact Assessment

Birmingham
Livery Place, 35 Livery Street, Colmore Business District
Birmingham, B3 2PB
T: 0121 233 3322

Leeds
Whitehall Waterfront, 2 Riverside Way
Leeds, LS1 4EH
T: 0113 233 8000

London
11 Borough High Street
London, SE1 9SE
T: 0207 407 3879

Manchester
11 Portland Street
Manchester, M1 3HU
T: 0161 233 4260

Nottingham
5th Floor, Waterfront House, Station Street
Nottingham, NG2 3DQ
T: 0115 924 1100

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P02	04/06/2025	Issue	James Storey BSc (Hons)	Sam Ellwood BSc (Hons) MIOA	Mike Barrett BSc (Hons), MIOA / Lucy Elmer BA (Hons), MSc, MIOA

Notice

EXECUTIVE SUMMARY

BWB Consulting (BWB) was instructed by Taylor Wimpey UK Limited to carry out a noise impact assessment to support an outline planning application with all matters except access reserved, for the erection of up to 135 dwellings, amenity space, areas for outdoor play, landscaping and all associated infrastructure.

The assessment is based on the Department for Environment Food and Rural Affairs (DEFRA) strategic noise mapping and has been undertaken in accordance with current standards and guidance, following consultation with Hinckley and Bosworth Borough Council (HBBC).

As the exact location of the dwellings is unknown at this time, mitigation has been suggested in outline terms only. It is considered that the internal and external noise levels could meet the requirements of BS 8233 with appropriate mitigation in place.

Based on the results of the assessment, it has been demonstrated that the site is suitable for the proposed residential development.

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1. INTRODUCTION

Instruction

1.1 BWB Consulting was instructed by Taylor Wimpey UK Limited to undertake a noise impact assessment to support the outline planning application with all matters except access reserved, for the erection of up to 135 dwellings, amenity space, areas for outdoor play, landscaping and all associated infrastructure.

1.2 This assessment has been undertaken based on Department for Environment Food and Rural Affairs (DEFRA) strategic noise mapping. The DEFRA strategic noise mapping has been assessed in accordance with current standards and guidance, following consultation with Hinckley and Bosworth Borough Council (HBBC).

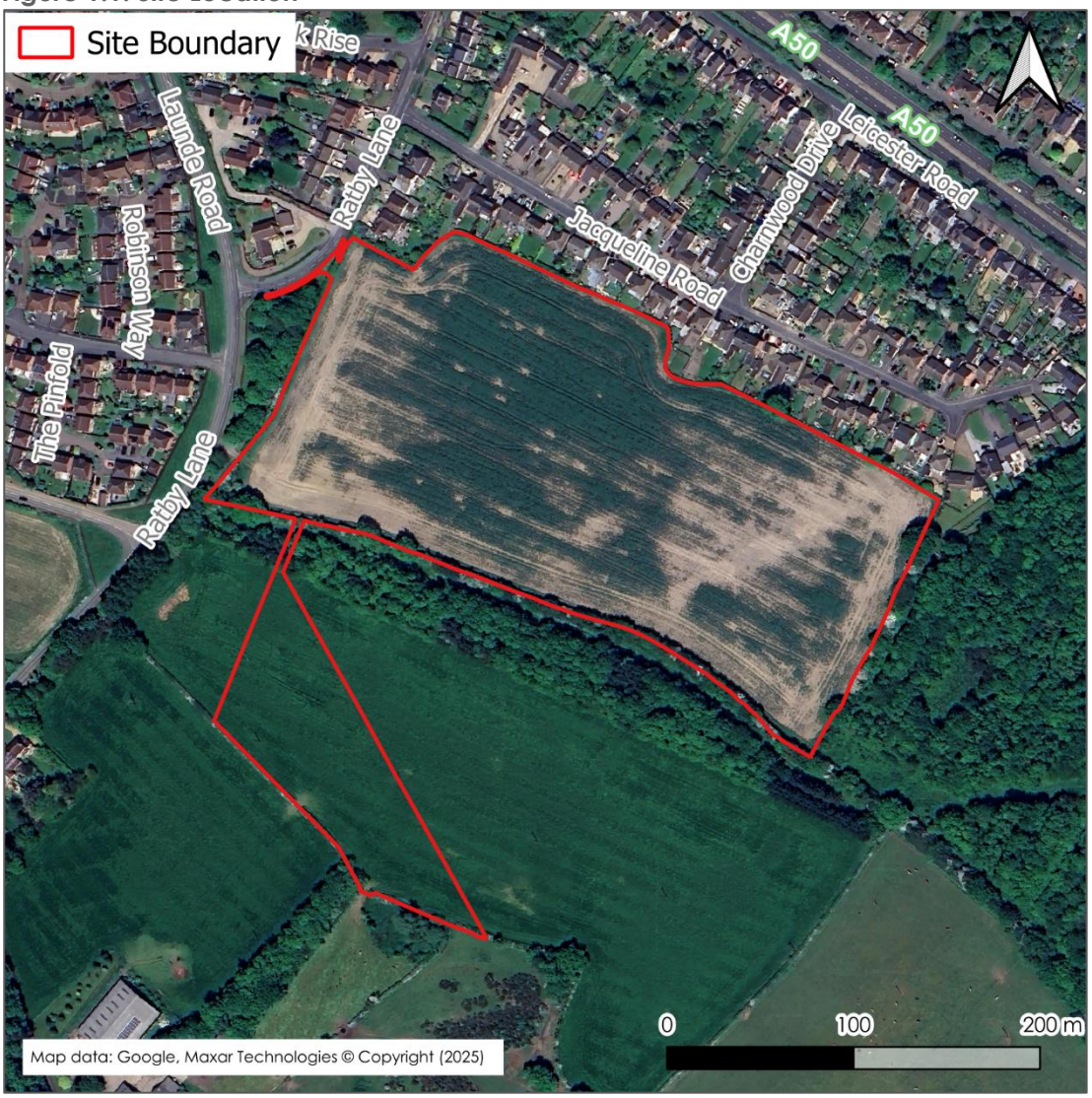
1.3 Where appropriate, consideration has been given to noise mitigation measures to demonstrate how an appropriate level of protection could be afforded to proposed noise sensitive receptors (NSRs) within the Site.

1.4 This report is necessarily technical in nature, so to assist the reader, a glossary of acoustic terminology can be found in **Appendix A**.

Site Setting

1.5 The proposed development Site currently comprises open farmland with existing houses to the north with the A50 beyond, woodland to the east with the A50 beyond, open farmland to the south, and Ratby Lane to the west with existing houses beyond. The location of the Site is shown in **Figure 1.1**.

Figure 1.1: Site Location



Proposed Development

1.6 The proposed development comprises the outline planning application with all matters except access reserved, for the erection of up to 135 dwellings, amenity space, areas for outdoor play, landscaping and all associated infrastructure. The Illustrative Masterplan is shown below in **Figure 1.2**.

Figure 1.2: Illustrative Masterplan

Drawing by CSA Environmental. Drawing No. CSA/2550/118. Rev: O

2. STANDARDS AND GUIDANCE

National Planning Policy Framework (NPPF)

2.1 Published in December 2024, this document sets out the Government's planning policies for England. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

> "*187. Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *[…]*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.*"

2.2 It also makes the following references to noise in the Section entitled *Ground conditions and pollution*:

> "*198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*
>
> *a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life[69];*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*
>
> *[72] See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).*"

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

2.3 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.

2.4 The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings and office 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 2.1** below:

Table 2.1: Summary of Internal Ambient Noise Levels to be Achieved in Habitable Rooms

Activity	Location	Internal noise level criteria ($L_{Aeq,T}$, dB)	
		Daytime (07:00 - 23:00hrs)	Night-time (23:00 - 07:00hrs)
Resting	Living room	35	-
Dining	Dining room/area	40	-
Sleeping (daytime resting)	Bedroom	35	30

2.5 Whilst BS 8233:2014 recognises that a guideline value may be set in terms of sound exposure level (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. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: Guidelines for Community Noise.

2.6 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 $L_{Aeq,T}$, 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 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

2.7 The World Health Organisation (WHO) guidance: 1999: Guidelines for community noise includes guidance for individual maximum noise events during the night-time. This document 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_{AFmax} more than 10-15 times per night*"

Approved Document O (Overheating Mitigation)

2.8 This document provides guidance on how to comply with Part O of the building regulations. The aim of Part O of the building regulations is to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures. Approved Document O (ADO) provides guidance on how to comply with Part O of the building regulations and applies to new residential developments only.

2.9 Paragraphs 3.2 and 3.3 of ADO refer to noise within bedrooms at night. It is considered that the intention is to manage the impact from sound generated from all non-natural

sources. Sources such as road, rail and air traffic, sources of an industrial or commercial nature, and sounds arising from entertainment venues are all within scope.

2.10 Paragraph 3.3 of ADO states:

"Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

(a) 40 dB $L_{Aeq,T}$ averaged over 8 hours (between 11pm and 7am.

(b) 55 dB L_{AFmax} more than 10 times a night (between 11pm and 7am)"

2.11 The document goes on to state that ventilators and windows should be open as required based on the overheating mitigation strategy. Where there is a natural ventilation strategy using open windows, the extent to which windows will need to be opened will depend on the physical arrangement, environmental conditions, and the number of room occupants, as determined in the CIBSE TM59 dynamic thermal modelling.

2.12 The Association of Noise Consultants (ANC) issued a guide in November 2024 entitled "Approved Document O Noise Guide".

2.13 Table 1 of this guidance document is replicated in **Table 2.2** and defines the noise levels at moderate and high-risk locations when considering the simplified assessment method.

Table 2.2: Noise Levels Using the Simplified Method

Parameter	High risk location	Moderate risk location
$L_{Aeq,8h}$ average over 8 hours (between 11pm and 7am)	45 dB	50 dB
L_{AFmax} more than 10 times a night (between11pm and 7am)	60 dB	65 dB

2.14 For clarity, the above table suggests that the sound insulation performance of the external building fabric when a window is open wide enough to comply with the guidance in ADO, is only in the region of 5 dB for high risk locations (where the opening is larger), and 10 dB for moderate risk locations (where the required window opening is smaller).

Defra Strategic Noise Mapping

2.15 Defra has published strategic noise map data that give a snapshot of the estimated noise from road and rail sources across England in 2021. The data was developed as part of implementing the Environmental Noise (England) Regulations 2006 with the maps produced for the fourth round of the 5 yearly cycle.

2.16 Maps were made using a new geospatial noise model developed by Defra. This model takes account of the requirements of the new modelling methodology introduced into

law since the previous round of mapping. It uses advances in data and technology to calculate noise exposure levels with a higher level of accuracy and coverage than ever before based on information such as traffic flow, road type and road surface data.

Consultation with Hinckley and Bosworth Borough Council

2.17 Consultation was undertaken with HBBC via email on the 29th April 2025 detailing the methodology of the noise impact assessment in order to agree the assessment approach.

2.18 The following methodology was proposed:

- Assess noise from road traffic at proposed noise sensitive receptors using DEFRA strategic noise mapping in accordance with BS8233:2014;
- Undertake an assessment of internal noise levels against the requirements in Approved Document O and good practice guidance in the Association of Noise Consultants 'Approved Document O Noise Guide' 2024;
- Where appropriate, noise mitigation measures will be considered, in outline terms only, to reduce noise to within acceptable levels at proposed noise sensitive receptors; and
- Provide a noise report summarising our findings.

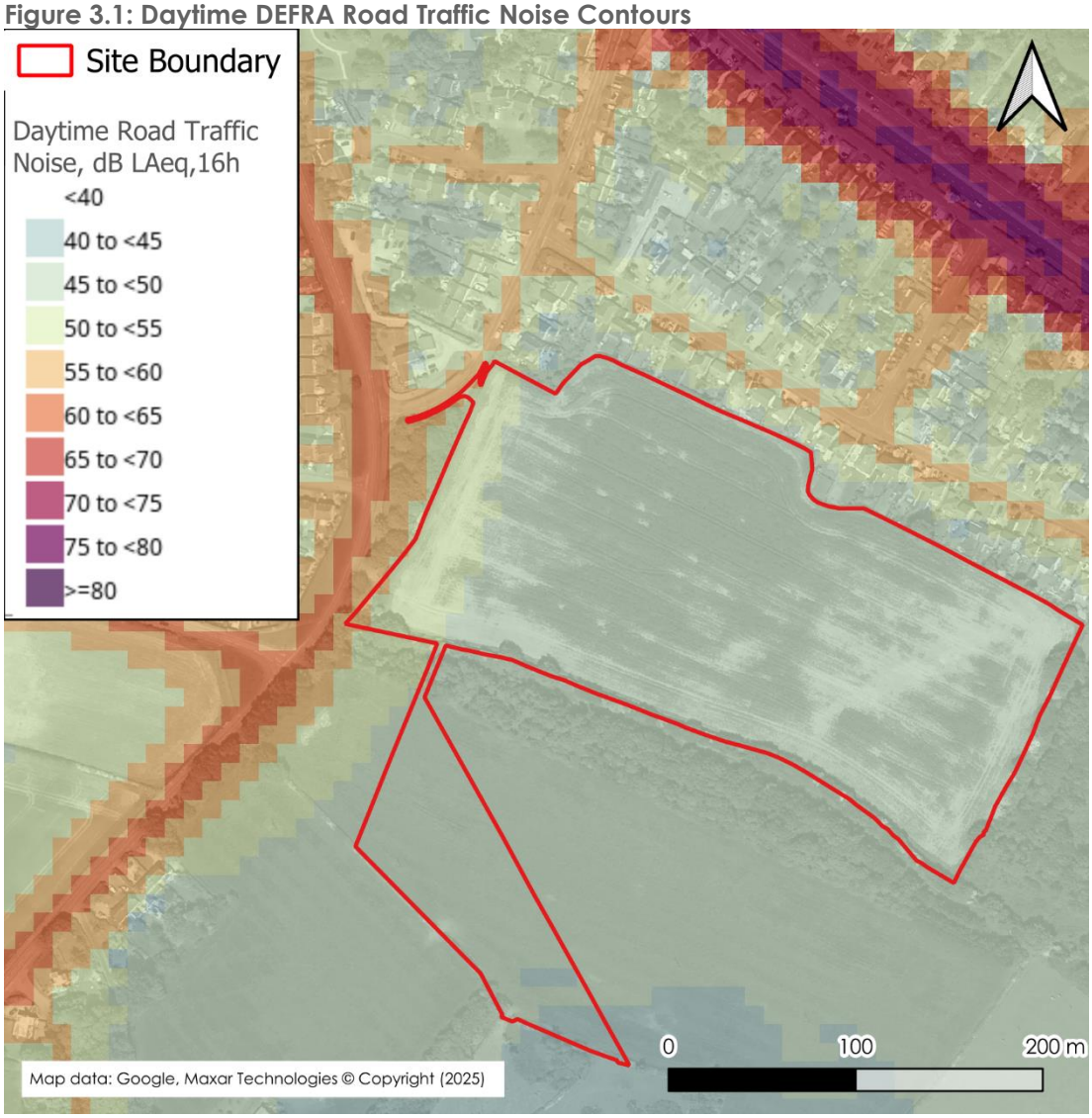
2.19 A reply was received on the 2nd May 2025 from Mr Smith, Environmental Protection Officer at HBBC, stating that the proposed methodology was acceptable.

3. DEFRA STRATEGIC NOISE MAPPING

3.1 DEFRA Strategic Road Traffic Noise Mapping has been gathered for the proposed development Site and is summarised in this section. The noise levels are modelled on a 10 m grid at a receptor height of 4 m above local ground.

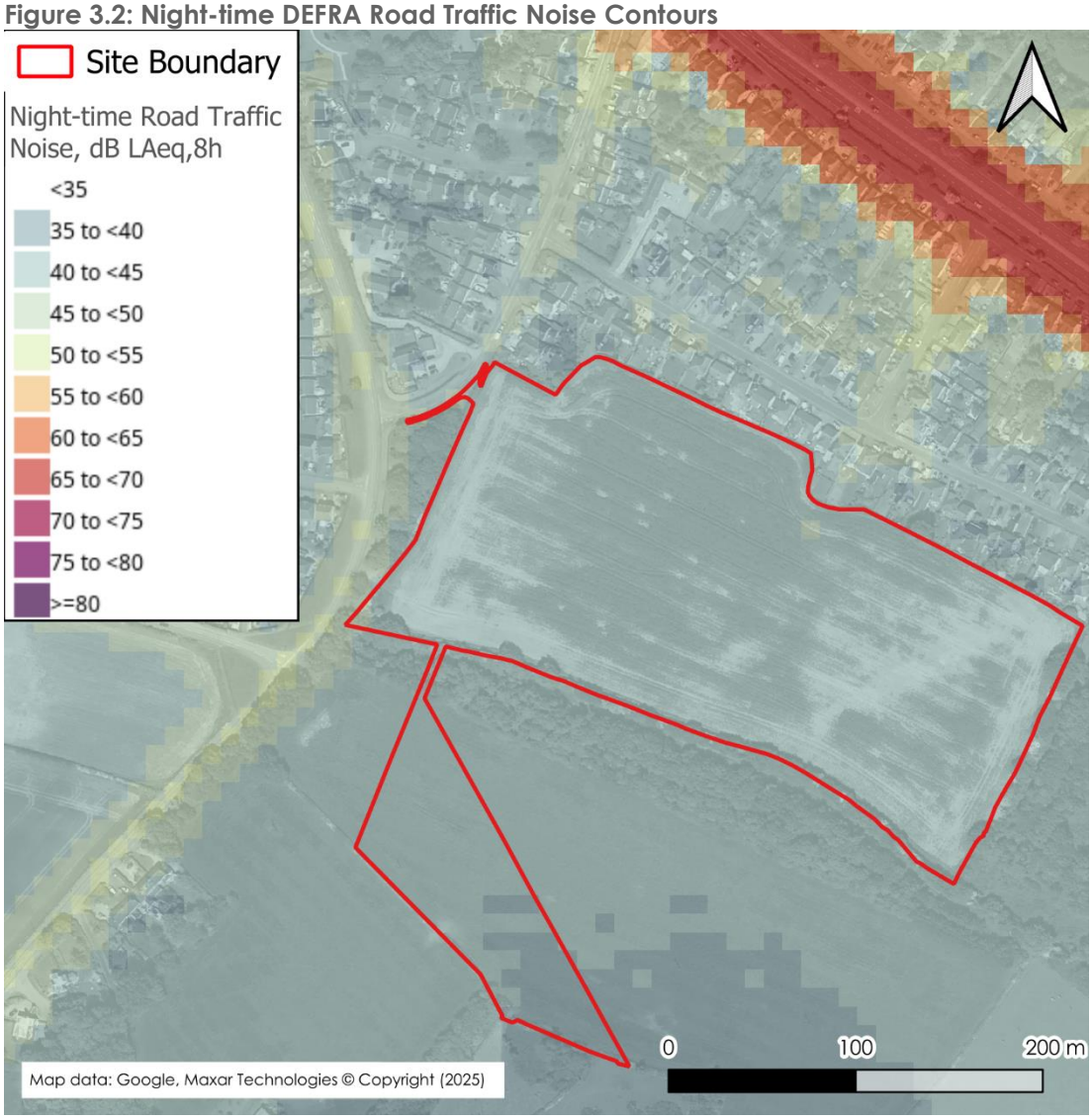
3.2 **Figure 3.1** and **Figure 3.2** show the daytime (07:00-23:00 hours) and night-time (23:00-07:00 hours) DEFRA noise maps respectively for all roads surrounding the proposed development Site.

Figure 3.1: Daytime DEFRA Road Traffic Noise Contours



3.3 The daytime DEFRA road traffic noise contours shown in **Figure 3.1** indicate the majority of the proposed development Site will experience road traffic noise levels below 50 dB $L_{Aeq,16h}$, with a small portion of the Site along the western boundary, nearest to Ratby Lane, experiencing levels up to 55 dB $L_{Aeq,16h}$.

Figure 3.2: Night-time DEFRA Road Traffic Noise Contours



3.4 The night-time DEFRA road traffic noise contours shown in **Figure 3.2** indicate the entire proposed development Site will experience road traffic noise levels below 45 dB $L_{Aeq,8h}$.

Representative L_{AFmax} Level

3.5 As the DEFRA Strategic Road Traffic Noise Mapping does not incorporate L_{AFmax} levels, an assessment has been undertaken utilising the results of a baseline noise survey completed previously by BWB Consulting. Noise measurements were undertaken of a road with similar speed and traffic flow characteristics as Ratby Lane.

3.6 **Table 3.1** shows the representative night-time L_{AFmax} level measured at a distance of 4 m from the kerbside edge of the road.

Table 3.1: Representative Road Traffic Noise Measurements

Period	dB L_{AFmax}[1]
Night-time	63

Period	dB L_{AFmax}[1]
[1] 10th highest measured L_{AFmax} level with 5 minute separation.	

3.7 It is assumed that on the proposed development Site dwellings will be built at least 10 m from the edge of Ratby Lane. Therefore, the representative measured L_{AFmax} has been corrected for distance using a simple point source correction. The corrected L_{AFmax} level which will be used in this assessment is 55 dB.

4. ASSESSMENT

External Daytime Noise Levels

4.1 The daytime noise levels on the proposed development Site are expected to be up to 55 dB $L_{Aeq,16h}$ with the majority of the Site below 50 dB $L_{Aeq,16h}$. It is therefore expected that the recommended BS8233 and WHO desirable level of 50 dB $L_{Aeq,16h}$ in gardens will be met across the majority of the Site, and the entire Site will be below the upper guideline of 55 dB $L_{Aeq,16h}$. Therefore, further consideration to mitigation in outdoor amenity areas is not required.

Internal Noise Levels

4.2 The majority of the proposed development Site is expected to experience noise levels below 50 dB $L_{Aeq,16h}$ and 45 dB $L_{Aeq,8h}$ during the daytime and night-time respectively. Assuming a 15 dB loss through a partially opened window, this would result in internal levels of up to 35 dB $L_{Aeq,16h}$ and 30 dB $L_{Aeq,8h}$ for the daytime and night-time respectively. Therefore, the criteria of 35 dB for the daytime and 30 dB for the night-time are likely to be met for the majority of the Site.

4.3 Along the western boundary of the Site, closest to Ratby Lane, road traffic noise levels are expected to be up to 55 dB $L_{Aeq,16h}$ and 45 dB $L_{Aeq,8h}$ during the daytime and night-time respectively. Assuming a 15 dB loss through a partially opened window, this would result in internal levels of up to 40 dB $L_{Aeq,16h}$ and 30 dB $L_{Aeq,8h}$ during the daytime and night-time respectively. Therefore the criteria of 35 dB $L_{Aeq,8h}$ during the daytime is expected to be exceeded for proposed dwellings closest to, and with direct line of sight to Ratby Lane. Consideration to mitigation is given in **Section 5**.

4.4 A partially opened window would also result in an internal level of 40 dB L_{AFmax} during the night-time. Therefore, the criteria of 45 dB L_{AFmax} during the night-time is expected to be met.

Overheating

4.5 Consideration has been given to the balance between habitable noise levels within internal spaces and thermal comfort. This assessment is based on guidance set-out in ADO, the ANC "Approved Document O Noise Guide" and the predicted noise levels at the facades of proposed receptors.

4.6 As this is a medium risk location as defined in ADO, the resulting outside-to-inside level difference for window openings necessary to satisfy the simplified method of ADO is expected to be 10 dB in line with the guidance in the ANC "Approved Document O Noise Guide".

4.7 Therefore, to show the adopted criteria as stated in Approved Document O is achieved using the simplified method, the noise level at the façade of proposed properties should not exceed the following during night-time:

a. 50 dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
b. 65 dB L_{AFmax}, more than 10 times a night (between 11pm and 7am).

4.8 Based on an $L_{Aeq,8h}$ of 45 dB and L_{AFmax} of 55 dB during the night-time for proposed dwellings closest to, and with direct line of sight to Ratby Lane, the criteria of 50 dB $L_{Aeq,8h}$ and 65 dB L_{AFmax} will met at the façade of proposed dwellings. Therefore for the houses closest to Ratby Lane, the simplified method can be used, and openable windows may be able to be relied upon to mitigate overheating without compromising the internal noise environment.

5. MITIGATION

5.1 In **Section 4**, it has been determined that consideration should be given to mitigation measures to protect the amenity of sensitive receptors associated with the proposed development.

Internal Noise Levels

5.2 In order to assess the noise mitigation required to ensure an adequate level of protection against noise, it is appropriate to explore in the first instance the protection that could be afforded by the sound insulation performance of the external building fabric, and in particular the glazing elements.

5.3 Detailed noise break-in calculations have been undertaken in accordance with the rigorous method from section G.2 from BS 8233 based on the frequency spectra given in BS EN 1793-3:1998 and the following assumed dimensions and assumptions;

- Room dimensions of 3m (width) x 2.5m (depth) x 2.5m (height);
- Double glazed window dimensions of 1.0m (width) x 2.5m (height);
- External building fabric elements shall achieve a sound reduction performance of at least $R_w + C_{tr}$ 48dB;
- A reverberation time of 0.5 seconds; and
- Assumed ventilator(s) provide an equivalent area of 8000 mm^2 per habitable room, in accordance with Approved Document F.

5.4 As this assessment is based on DEFRA strategic noise mapping, and no baseline noise survey has been undertaken on the proposed Site, the break-in calculations are based on the normalised traffic noise spectrum given in BS EN 1793-3:1998[1]. The frequency spectra, and correction to reflect road traffic noise levels at the proposed Site can be seen in **Table 5.1**.

Table 5.1: Road Traffic Noise Frequency Spectra

	Octave Band Sound Pressure Levels (L_{eq} dB)						dB (A)
	125 Hz	250Hz	500 Hz	1kHz	2kHz	4kHz	
Normalized traffic noise spectrum	2	-1.4	-3.9	-3.8	-7.5	-12.4	-
Corrected daytime ($L_{eq,16h}$)[1]	54	51	48	48	45	40	55
Corrected night-time ($L_{eq,8h}$)[1]	44	41	38	38	35	30	45

[1] British Standard BS EN 1793-3:1998 Road Traffic Noise Reducing Devices – Test Method for Determining the Acoustic Performance: Part 3. Normalised Traffic Noise Spectrum.

	Octave Band Sound Pressure Levels (L_{eq} dB)						dB (A)
	125 Hz	250Hz	500 Hz	1kHz	2kHz	4kHz	
Corrected night-time (L_{Fmax})[1]	54	51	48	48	45	40	55
[1] BE EN 1793-3:1998 normalised traffic noise spectrum adjusted to reflect the expected road traffic noise levels along the western boundary of the Site.							

5.5 To achieve the daytime internal noise criterion of 35 dB $L_{Aeq,16h}$ adopted for this assessment, based on a façade closest to Ratby Lane experiencing up to 55 dB $L_{Aeq,16h}$ free-field at the façade during the daytime, a reduction of 20 dB would be required for habitable rooms.

5.6 For dwellings located closest to, and with direct line of sight to Ratby Lane, all internal criteria would be achieved with standard double glazing (example configuration: 4 mm/(6-16 mm)/4 mm), which would need to provide a minimum $R_w + C_{tr}$ of 25 dB. Three ventilators such as the Greenwood 6000S, which achieve a minimum performance of $D_{n,e,w} + C_{tr}$ 31 dB, would be required.

5.7 For dwellings that are located further back into the site that benefit from screening provided by the development itself, it is likely that standard double glazing and open windows will be sufficient to mitigate noise to acceptable levels.

5.8 The above presents solutions to satisfy the proposed internal ambient noise limits within habitable rooms during normal ventilation conditions.

5.9 **Table 5.2** shows the resultant internal noise levels at the notional receptor, with mitigation in place.

Table 5.2: Predicted External and Internal Noise Levels with Mitigation, dB

Facade	Predicted External Noise Level, free-field			Resultant Internal Noise Level		
	$L_{Aeq,16h}$	$L_{Aeq,8h}$	L_{AFmax}	$L_{Aeq,16h}$	$L_{Aeq,8h}$	L_{Afmax}
Closest to Ratby Lane	55	45	55	30	20	30

5.10 The final glazing and ventilation schedule should be finalised on a plot-by-plot basis at the appropriate design stage by a qualified acoustician, once the final internal layouts and glazing areas for each room are known.

6. CONCLUSIONS

6.1 BWB Consulting (BWB) was instructed by Taylor Wimpey UK Limited to carry out a noise impact assessment to support an outline planning application with all matters except access reserved, for the erection of up to 135 dwellings, amenity space, areas for outdoor play, landscaping and all associated infrastructure.

6.2 The assessment is based on DEFRA strategic noise mapping and has been undertaken in accordance with current standards and guidance, following consultation with Hinckley and Bosworth Borough Council (HBBC).

6.3 As the exact location of the dwellings is unknown at this time, mitigation has been suggested in outline terms only. It is considered that the internal and external noise levels could meet the requirements of BS 8233 with appropriate mitigation in place.

6.4 Based on the results of the assessment, it has been demonstrated that the site is suitable for residential development.

APPENDICES

APPENDIX A: Glossary of Acoustic Terms

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurement, and the levels are denoted as dB(A) or L_{Aeq}, L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

Acoustic Terminology

Term	Description
dB (decibel)	The scale on which sound pressure level is expressed. Sound pressure level is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2x10-5Pa).
dB(A)	A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' - weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.
$L_{Aeq,T}$	L_{Aeq} is defined as the notional steady sound level which, over a stated period of time (T), would contain the same amount of acoustical energy as the A - weighted fluctuating sound measured over that period.
L_{Amax}	L_{Amax} is the maximum A - weighted sound pressure level recorded over the period stated. L_{Amax} is sometimes used in assessing environmental noise where occasional loud noises occur, 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_{10} and L_{90}	If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence L_{10} is the level exceeded for 10% of the time, and the L_{90} is the level exceeded for 90% of the time.
Sound Power Level, L_w	logarithm of the ratio of a given sound power to the reference sound power. Such power level in decibels is ten times the logarithm to the base ten of the ratio. unless otherwise specified, the reference sound power is 1 pW. Sound power is the total sound energy radiated by a sound source and measured in watts (W). Sound power level
Free-field Level	A sound field determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces. Generally as measured outside and away from buildings.
Façade Level	A sound field determined at a distance of 1m in front of a large sound reflecting object such as a building façade.
R/R_w	R is the laboratory measurement of the sound insulating properties of a material or building element in a stated frequency band R_w is the weighted Sound Reduction Index a single number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies, based on laboratory measurements.
D_{ne}/$D_{ne,w}$	D_{ne} is the laboratory measured level difference of a building element which has been normalised to a referenced absorption of 10$m^{2.}$ $D_{ne,w}$ is the is the weighted Sound Reduction Index a single number quantity which characterises the airborne sound insulation of a material or building element over a range of frequencies, based on laboratory measurements.
C_{tr}	Spectrum Adaptation Terms (C and C_{tr}) the single number rating method defined in BS EN ISO 717 uses a standard reference curve to determine the weighted value of airborne sound insulation. The spectrum adaptation term C_{tr} is used to take into urban traffic noise.

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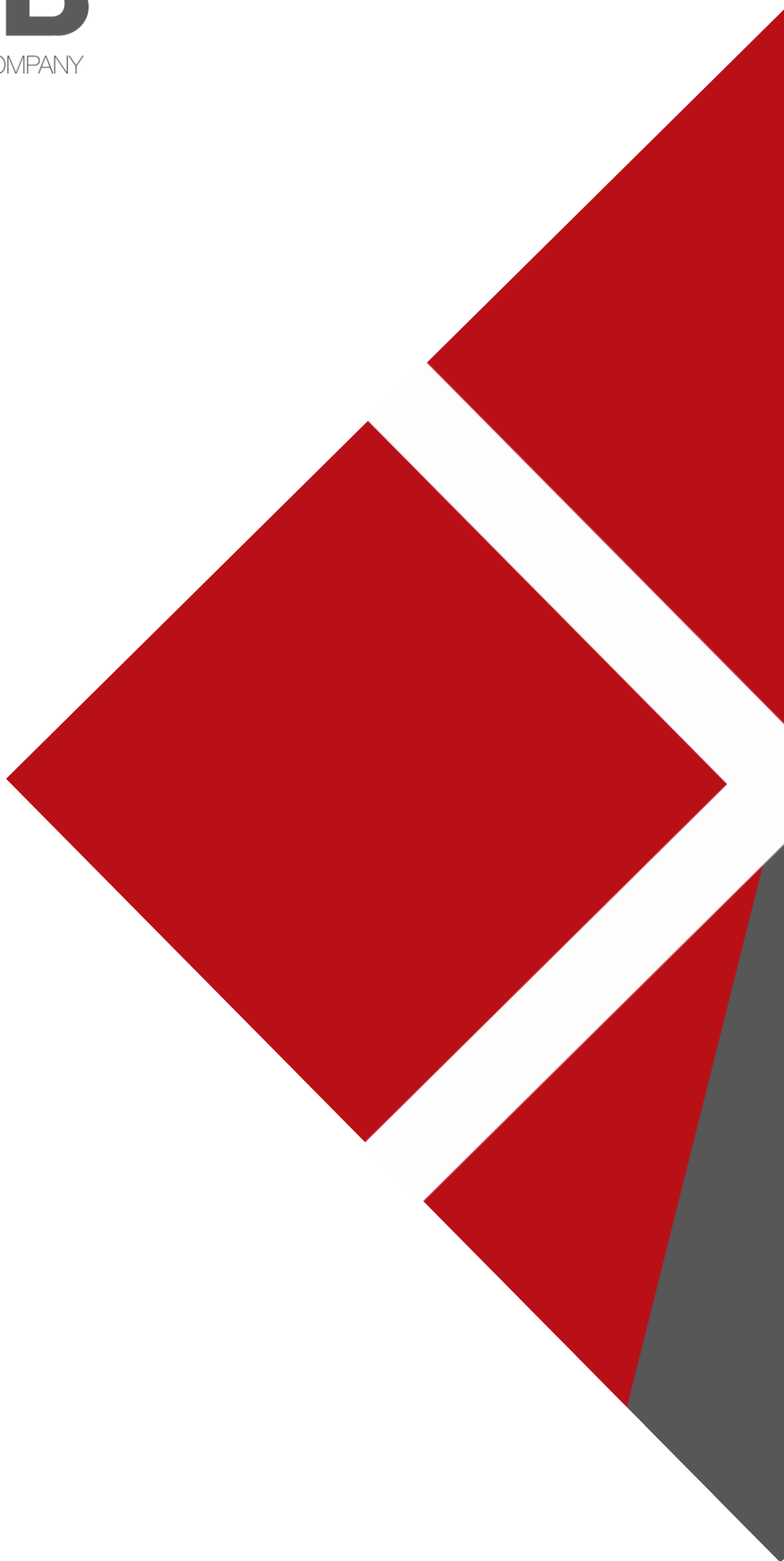

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