Our ref: NIA/6882/16/6782/v3/Lundhill Road, Wombwell

7th September 2016

Mr James Parkin
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LS9 6PW

Sent by email only james-parkin@persimmonhomes.com

Dear Sirs,

NOISE IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT
LAND TO THE EAST OF LUNDHILL ROAD, WOMBWELL, BARNSLEY, S73 0RL

1.00 INTRODUCTION

1.01 Environmental Noise Solutions Limited has been commissioned by Persimmon Homes West Yorkshire to carry out a noise impact assessment for a proposed residential development (circa 165 dwelling houses) at land to the east of Lundhill Road, Wombwell, Barnsley, S73 0RL (hereafter referred to as the application site).

1.02 The objectives of the noise impact assessment were to:

- Determine the ambient noise climate at the application site
- Assess the potential impact of the ambient noise climate on the proposed residential development with reference to pertinent guidance
- Provide recommendations for a scheme of sound attenuation works, as necessary

1.03 This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation) and boundary treatments (as necessary). It has been prepared to accompany a planning application to be submitted to Barnsley Metropolitan Borough Council for the proposed residential development of the application site.

1.04 This report has been prepared for Persimmon Homes West Yorkshire for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult Persimmon Homes West Yorkshire and ENS as to the extent to which the findings may be appropriate for their use.

1.05 A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

2.00 APPLICATION SITE SETTING AND PROPOSED RESIDENTIAL DEVELOPMENT

2.01 For reference, the application site is located in a predominantly residential setting. Irregular in shape, the application site is bound by (see Appendix 2 illustrative layout):

- Existing residential dwellings to the north and east
- Open fields and Elsecar Canal to the south (A6195 Dearne Valley Parkway further south)
- Lundhill Road to the west (open fields further west)

2.02 During the course of the noise survey, the principal noise source across the application site was road traffic on the A6195 Dearne Valley Parkway to the south and Lundhill Road to the west.

2.03 The proposed residential development consists of circa 165 dwelling houses with associated gardens and infrastructure.

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3.00 BASELINE NOISE SURVEY

3.01 In order to establish the ambient and background noise levels at the application site, a baseline noise survey was undertaken on Thursday 18th August 2016.

3.02 For the purpose of the assessment, the following noise monitoring positions (see Appendix 2) were adopted at either 4.0 metres above ground level (MP1) or 1.5 metres above ground level (MP2 and MP3) in a free field environment:

- MP1 was located at the south eastern development footprint (representative of the proposed development in closest proximity to the A6195 Dearne Valley Parkway)
- MP2 was located at the western development footprint (representative of the proposed development in closest proximity to Lundhill Road)
- MP3 was located at the central development footprint

3.03 Noise measurements were undertaken using Bruel & Kjaer 2250 Type 1 integrating sound level meters. A windshield was fitted for all measurements. The measurement system calibration was verified immediately before the commencement of the measurement sessions and again at the end, using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted.

3.04 Measurements consisted of A–weighted broadband parameters, together with linear octave band L_{eq} levels. The following table contains a summary of the measurement data for each measurement session, at each measurement position, rounded to the nearest decibel.

Table 3.1 – Noise Measurement Data

Position	Date	Time	$L_{Aeq,T}$ (dB)	$L_{A90,T}$ (dB)	$L_{A10,T}$ (dB)	$L_{A1,T}$ (dB)	Comment
MP1	18/08/16	05:00-06:00	50	45	53	55	A6195 Dearne Valley Parkway
		06:00-07:00	52	49	55	56	
		07:00-08:00	54	51	56	58	
		08:00-09:00	54	51	56	57	
		09:00-10:00	54	51	56	57	
		10:00-11:00	55	53	57	59	
		11:00-12:00	55	53	57	59	
		12:00-13:00	55	53	57	59	
Daytime ambient noise level at MP1 circa 54 dB $L_{Aeq\ (0700\text{-}2300)}$ based on CRTN methodology Night time ambient noise level at MP1 circa 47 dB $L_{Aeq\ (2300\text{-}0700)}$ based on TRL methodology							
MP2	18/08/16	10:40–11:10	50	45	53	58	Lundhill Road
Daytime ambient noise level at MP1 circa 50 dB $L_{Aeq\ (0700\text{-}2300)}$ based on LA10 circa 4 dB lower than MP1 Night time ambient noise level at MP1 circa 43 dB $L_{Aeq\ (2300\text{-}0700)}$ based on LA10 circa 4 dB lower than MP1							
MP3	18/08/18	10:02-10:32	53	50	55	57	A6195 Dearne Valley Parkway
Daytime ambient noise level at MP3 circa 52 dB $L_{Aeq\ (0700\text{-}2300)}$ based on LA10 circa 2 dB lower than MP1 Night time ambient noise level at MP1 circa 49 dB $L_{Aeq\ (2300\text{-}0700)}$ based on LA10 circa 2 dB lower than MP1							

3.05 During the course of the survey, the principal noise source across the application site was road traffic noise from the A6195 Dearne Valley Parkway to the south east and (to a lesser extent) Lundhill Road to the west.

3.06 For the prediction of daytime road traffic noise, the Department of Transport's Memorandum on the Calculation of Road Traffic Noise (CRTN) explains that measurements of L_{A10} may be made during periods between 10:00 and 17:00 hours. The $L_{A10\ (18\ hour)}$ is calculated from:

(i) $L_{A10\ (0600–0000)} = L_{A10\ (3\ hour)} – 1$ dB

(ii) $L_{Aeq\ (0700–2300)} \approx L_{A10\ (0600–0000)} – 2$ dB

3.07 Substituting (ii) into (i) gives the following approximation:

(iii) $L_{Aeq\ (0700–2300)} \approx L_{A10\ (3\ hour)} – 3$ dB

3.08 Based on the above formula, the daytime ambient noise level at MP1 (the residential development footprint in closest proximity to the A6195 Dearne Valley Parkway) is measured / calculated at 54 dB $L_{Aeq\ (0700–2300)}$.

3.09 A study prepared by TRL Limited on behalf of the Department for Environment, Food and Rural Affairs (DEFRA) entitled 'Converting the UK Traffic Noise Index $L_{A10\ (18\ hour)}$ to EU Noise Indices for Noise Mapping' presents a methodology for calculating night time road traffic noise levels based on daytime road traffic noise level based on the following formula:

(iv) $L_{Aeq\ (2300–0700)} \approx 0.90 * L_{A10\ (18\ hour)} – 3.77$ (for non-motorways)

3.10 Based on the above formulae, the night time ambient noise level at MP1 (the residential development footprint in closest proximity to the A6195 Dearne Valley Parkway) is measured / calculated at 47 dB $L_{Aeq\ (2300–0700)}$.

3.11 Such daytime and night time ambient noise levels are relatively low.

4.00 NATIONAL PLANNING POLICY FRAMEWORK PLANNING PRACTICE GUIDELINES ON NOISE AND OTHER RELEVANT GUIDANCE

4.01 In terms of noise impact assessment criteria, Paragraph 123 of the National Planning Policy Framework states that planning policies and decisions should aim to '*avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development'.*

4.02 Planning Practice Guidance specifically dealing with noise was uploaded to the Government's Planning Portal in March 2014 as an accompaniment to the National Planning Policy Framework. This guidance was further updated in December 2014.

4.03 The guidance states '*… consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations*'.

4.04 Building Regulations Approved Document F 'Ventilation' (2010 version incorporating 2013 amendments) states '*For mainly naturally ventilated buildings, it is common to use a combination of ventilators (e. g. for dwellings it is common to use intermittent extract fans for* ***extract ventilation****, trickle ventilators for* ***whole dwelling ventilation*** *and windows for* ***purge ventilation). …*** *Purge ventilation throughout the building to aid the removal of high concentrations pollutants and water vapour released from occasional activities such as painting and decorating and or accidental releases such as smoke and burnt food or spillage of water. Purge ventilation is intermittent i.e. required only when such activities occur. Purge ventilation provisions may also be used to improve thermal comfort, although this is* ***not controlled*** *under Building Regulations*'.

4.05 It is therefore evident that whilst ventilation may also provide a means to control thermal comfort this is not controlled under Building Regulations. Part L addresses minimising energy use due to the effects of solar gain in summer.

4.06 It is therefore evident that trickle ventilation is considered an alternative means of ventilation under Building Regulations Approved Document F 'Ventilation' (2010 version incorporating 2013 amendments).

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4.07 British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233) sets indoor ambient noise levels from residential dwellings (see table below).

Table 4.1 – Indoor Ambient Noise Levels in Dwellings (BS 8233:2014)

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700–2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700–2300)}$	30 dB $L_{Aeq\ (2300–0700)}$

4.08 Note 5 to the above table states '*If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment*'.

ENS note: it is evident that BS 8233 considers that adequate ventilation is provided by trickle ventilators in an open position.

4.09 Note 7 to the above table states '*Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.*'

ENS note: It is evident that BS 8233 considers that reasonable resting and sleeping conditions are achieved with indoor ambient noise levels of ≤ 40 dB $L_{Aeq\ (0700–2300)}$ and ≤ 35 dB $L_{Aeq\ (2300–0700)}$.

4.10 On the basis of the above, the following internal ambient noise levels, which represent good resting and sleeping conditions, are considered appropriate (with windows closed and trickle vents open):

- ≤ 35 dB $L_{Aeq\ (0700-2300)}$ in living rooms and dwellings during the daytime
- ≤ 30 dB $L_{Aeq\ (2300-0700)}$ in bedrooms during the night time

4.11 Based on measurements taken at numerous sites, a typical standard double glazed window with trickle vents in a building façade provides circa 27 dB(A) sound insulation (from external to internal) to road traffic noise.

4.12 For reference, the World Health Organisation (WHO) Guidelines for Community Noise (1999) states *"the noise reduction from outside to inside with the window partly open is 15 dB."*

4.13 Based on the measured / calculated ambient noise levels across the application site, it is evident that very good internal ambient noise levels will be achieved across the application site with windows closed and trickle vents open, whilst good to reasonable internal ambient noise levels will be achieved across the application site with partially open windows.

4.14 With respect to gardens, BS 8233 further states 'For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed *50 dB $L_{Aeq\ (0700-2300)}$, with an upper guideline value of 55 dB $L_{Aeq\ (0700-2300)}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'*

4.15 Based on relatively low daytime ambient noise levels at the application site, there is no issue with respect to garden amenity (further it is presumed gardens will be provided with boundary fencing).

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5.00 CONCLUSIONS

5.01 A noise impact assessment has been undertaken for a proposed residential development at land to the east of Lundhill Road, Wombwell, S73 0RL

5.02 The ambient noise climate at the application site is due to road traffic noise from the A6195 Dearne Valley Parkway to the south east and, to a lesser extent, Lundhill Road to the west.

5.03 The ambient noise levels measured at the application site are relatively low. On this basis, the ambient noise climate does not pose a constraint to the proposed residential development.

I trust the foregoing is sufficient for your needs. Should you have any queries regarding the above, please do not hesitate to contact me.

Yours sincerely,

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MIOA, Diploma in Acoustics and Noise Control, BSc (Hons)
Environmental Noise Solutions Limited

cc File

Appendix 1
Glossary of Acoustic Terms

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 µPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 µPa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

Weighted Sound Reduction Index (R_W)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_W is used to characterise the insulation of a material or product that has been measured in a laboratory).

Appendix 2
Illustrative Layout