Our ref: NIA/6244/15/6098/v2/Shaw Lane, Carlton

9th October 2015

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Dear Sirs

NOISE IMPACT ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT
LAND TO THE SOUTH OF THE WHARNCLIFFE ARMS, SHAW LANE, CARLTON, BARNSLEY

1.00 INTRODUCTION

1.01 Environmental Noise Solutions has been commissioned by Andrew Bailey Architects to carry out a noise impact assessment for the proposed residential development at land to the south of the Wharncliffe Arms, Shaw Lane, Carlton, Barnsley (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 during representative periods of the daytime and night time
- Assess the potential impact of the ambient noise climate on the proposed residential development with reference to the National Planning Policy Framework and other pertinent guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary, so that the future occupants of the proposed development do not experience any unacceptable loss of amenity due to noise

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

1.04 This report has been prepared for Andrew Bailey Architects 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 Andrew Bailey Architects 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 DEVELOPMENT

2.01 The application site is located in a mixed use residential and commercial environment. Roughly rectangular in shape (see Appendix 2 for a site layout) the application site is bound by:

- Shaw Lane to the north
- Fish Dam Lane to the east
- Open land to the west (existing residential dwellings beyond)
- Premier Foods cake factory to the south

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2.02 The noise environment across the application site is characterised by road traffic noise from Fish Dam Lane (circa 500 vehicles per hour during the daytime), Shaw Lane (circa 300 vehicles per hour during the daytime) and vehicle movements associated with Premier Foods.

2.03 The façades of the nearest proposed dwellings to Fish Dam Lane are located circa 8 to 12 metres from the nearside kerb. The façades of the nearest proposed dwellings to Premier Foods are located circa 21 to 34 metres from the service access road. It is understood that vehicle movement to/from Premier Foods occur throughout the night time period.

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 Wednesday 16th September 2015.

3.02 For the purpose of the assessment, the following noise monitoring positions were adopted (the approximate location of the noise monitoring positions is contained in Appendix 2 for reference):

- MP1 was located along the western boundary of the application site at circa 8 metres to the nearside kerb of Fish Dam Lane
- MP2 was located along the southern boundary of the application site at circa 15 metres to the access road to Premier Foods
- MP3 was located along the northern boundary of the application site at circa 20 metres to the nearside kerb of Shaw Lane

3.03 Noise measurements were made in a free field environment at 1.5 metres above ground level and 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. Weather conditions throughout the survey were appropriate for monitoring.

3.04 Measurements consisted of A–weighted broadband parameters, together with linear one-third 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 – Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{A1} (dB)	Comment
MP1	16/09/15	11:38–12:38	61	53	64	68	Fish Dam Lane traffic Circa 500 vehicles per hour
MP1	16/09/15	12:38–13:38	61	51	64	71	
MP1	16/09/15	13:38–14:38	61	53	64	70	
MP1	16/09/15	23:00–00:00	55	42	58	68	Fish Dam Lane traffic (typically 71 dB L_{AFMax})
Daytime ambient noise level 61 dB $L_{Aeq\ (0700\text{-}2300)}$ based on CRTN methodology Night time ambient noise level of 53 dB $L_{Aeq\ (2300\text{-}0700)}$ based on TRL methodology (note: typically 71 dB L_{AFMax} at night)							
MP2	16/09/15	12:53–14:22	55	50	57	62	HGV traffic on access road, 12 no. vehicle passes (typically 70 dB L_{AFMax})
MP2	16/09/15	23:00–00:00	52	43	54	61	HGV traffic on access road, 10 no. vehicle passes (typically 70 dB L_{AFMax})
Daytime ambient noise level circa 55 dB $L_{Aeq,\ T}$ Night time ambient noise level 52 dB $L_{Aeq,\ T}$ (note: typically 70 dB L_{AFMax} at night)							
MP3	16/09/15	11:17–11:32	54	46	57	62	Shaw Lane traffic Circa 300 vehicles per hour
MP3	16/09/15	14:56–15:11	54	46	56	64	
Daytime ambient noise level circa 54 $L_{Aeq,T}$							

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3.05 Noise levels along western boundary of the application site (MP1) were dominated by road traffic on Fish Dam Lane.

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 the following shortened measurement procedure may be used. Measurements of L_{A10} are made over any three consecutive hours between 10:00 and 17:00 hours. Using $L_{A10\ (3\ hour)}$ as the arithmetic mean of the three consecutive values of hourly L_{A10}, the $L_{A10\ (18\ hour)}$ can be calculated from the equation:

(i) $L_{A10\ (18\ hour)} = L_{A10\ (3\ hour)} - 1\ dB$

3.07 PPG24 further states that for road traffic noise:

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

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

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

3.09 Based on the above formula, the daytime ambient noise level at MP1 is measured / calculated at 61 dB $L_{Aeq\ (0700–2300)}$.

3.10 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) $L_{Aeq\ (23:00–07:00)} \approx 0.90 * L_{A10,\ 18\ hour} - 3.77$ (for non-motorways)

3.11 Based on the above formula, the night time ambient noise levels at MP1 is measured / calculated at 53 dB $L_{Aeq\ (2300–0700)}$. Maximum noise levels at MP1 during the night time were typically 71 dB L_{AFMax}.

3.12 Daytime and night time ambient noise levels at the southern boundary of the application site (MP2) were due to occasional HGV passes associated with Premier Foods. Maximum noise levels at MP2 during the night time were typically 70 dB L_{AFMax}.

4.00 NOISE IMPACT ASSESSMENT CRITERIA

4.01 BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233) supersedes the 1999 version of the Standard, which has been withdrawn. BS 8233 sets guideline indoor ambient noise levels for dwellings, for steady external noise sources, which it is desirable, are not exceeded. These levels are reproduced in Table 4.1.

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

Activity	Location	0700–2300	2300–0700
Resting	Living Room	35 dB $L_{Aeq\ (16\ hour)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (16\ hour)}$	30 dB $L_{Aeq\ (8\ hour)}$

4.02 On the basis of the above, for residential development, the following criteria are considered appropriate:

- 35 dB $L_{Aeq\ (0700\text{-}2300)}$ in living rooms and bedrooms during the daytime
- 30 dB $L_{Aeq\ (2300\text{-}0700)}$ in bedrooms at night
- 45 dB $L_{AFMax\ (2300\text{-}0700)}$ not normally exceeded in bedrooms at night

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4.03 British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' 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 $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ 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.'

5.00 SOUND ATTENUATION SCHEME PROPOSALS

5.01 A scheme of sound insulation for the application site is summarised in the table below:

Table 5.1 –Sound Attenuation Scheme

Location	Noise Level	Internal Criteria	Glazing and Ventilation
Plots 1 – 4 Western façade	61 dB $L_{Aeq\ (0700–2300)}$ 53 dB $L_{Aeq\ (2300–0700)}$ 71 dB $L_{AFMax\ (2300–0700)}$	< 35 dB $L_{Aeq\ (0700–2300)}$ < 30 dB $L_{Aeq\ (2300–0700)}$ < 45 dB $L_{AFMax\ (2300–0700)}$	Enhanced double glazing > 29 dB R_w+C_{tr} i.e. 8/(6-20)/4 and standard trickle vents to all habitable rooms
Plots 6 and 7 Southern façade	55 dB $L_{Aeq\ (0700–2300)}$ 53 dB $L_{Aeq\ (2300–0700)}$ 70 dB $L_{AFMax\ (2300–0700)}$	< 35 dB $L_{Aeq\ (0700–2300)}$ < 30 dB $L_{Aeq\ (2300–0700)}$ < 45 dB $L_{AFMax\ (2300–0700)}$	Enhanced double glazing > 28 dB R_w+ C_{tr} i.e. 8/(6-20)/4 and standard trickle vents to all habitable rooms
Remaining façades and plots			Standard double glazing Standard trickle vents

5.02 For the dwellings identified in Table 5.1 above, which require enhanced double glazing, should there be any room-in-roof constructions, these should have:

- Double boarded ceilings / walls (and also double board 'cheek' walls to dormer windows overlooking the surrounding road network
- An equivalent glazing specification to that in Table 5.1 to dormer / roof windows overlooking the surrounding road network

5.03 Plans indicate that the gardens of Plots 1–4 are to the rear and therefore screened from Fish Dam Lane by the dwellings themselves. Daytime ambient noise levels at remaining plots were relatively low. On this basis there is no issue with respect to garden amenity.

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6.00 CONCLUSIONS

6.01 A noise impact assessment has been undertaken for the proposed residential development at land to the south of the Wharncliffe Arms, Shaw Lane, Carlton, Barnsley.

6.02 The ambient noise climate across the majority of the application site is due to road traffic noise on Fish Dam Lane and Shaw Lane, with localised contributions from vehicle movements associated with Premier Foods.

6.03 A scheme of sound insulation works has been developed to protect the proposed residential development from the ambient noise climate. As a consequence, the ambient noise climate is not considered to represent 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.

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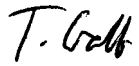
Yours sincerely



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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
Drawings (Site Plan / Noise Monitoring Positions)