Our ref: NIA/9248/20/9221/v3/ Church Lane

1st March 2021

Ms. Lynsey Ford
The Casey Group Ltd
Rydings Road
Rochdale
OL12 9PS

By email only: Lynsey.Ford@casey.co.uk

Dear Ms. Ford

NOISE IMPACT ASSESSMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT BROAD OAK FARM, LAND NORTH OF CHURCH LANE, LINTHWAITE, HUDDERSFIELD

1.00 INTRODUCTION

1.01 Environmental Noise Solutions Limited (ENS) has been commissioned by The Casey Group to carry out a noise impact assessment for a proposed new build residential development at Broad Oak Farm at land north of Church Lane in Linthwaite, Huddersfield (hereafter referred to as the application site).

1.02 The objectives of the noise impact assessment were to:

- Determine external noise levels at the application site.
- Assess the potential impact of the external noise climate on the proposed residential development with reference to relevant guidelines.
- Provide recommendations for a scheme of sound attenuation works, as necessary, to protect future occupants of the proposed residential development from a 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 the local planning authority.

1.04 This report has been prepared for The Casey Group Ltd 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 The Casey Group Ltd 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 The application site is located within the village of Linthwaite in Huddersfield. Irregular in shape (see Appendix 2 for a site layout) the application site is bound by:

- Church Lane to the south with existing residential dwellings further beyond.
- Agricultural land to the east.
- Existing residential dwellings to the north-east on Ladybower Avenue.
- Existing residential dwellings to the north-west on The Lodge and Cowlersley Lane / Hazel Grove.
- Broad Oak Bowling Club to the north-west.
- Cricket pitch to the west.

2.02 Development proposals are for 125 no. dwellings with associated access roads and landscaping.

2.03 In accordance with the Kirklees Council Local Plan February 2019 the application site is allocated for residential use (ref: HS129). The local plan specifically mentions a constraint for noise as follows *'Noise source near site - noise from sports facilities.'* Therefore, we have also addressed the raised noise constraints within the local area associated with the cricket and bowling club in addition to the dominant noise source which is road traffic.

3.00 BASELINE NOISE SURVEY

3.01 In order to establish external noise levels at the application site, a baseline noise survey was undertaken on Thursday 30th July 2020 through to the early hours of Friday 31st July 2020.

3.02 The following noise monitoring positions were adopted (the approximate locations of the noise monitoring positions are shown in Appendix 2 for reference):

- MP1 was located on the south-eastern boundary of the application site at circa 7 metres back from the near side kerb of Church Lane at a height of 4 metres above ground level (AGL).
- MP1A was located at circa 14 metres back from the nearside kerb of Church Lane at 4 metres AGL.
- MP2 was located in a central position of the application site at 4 metres AGL.
- MP3 was located on the north-western boundary of the application site at 4 metres AGL.
- MP4 was located on the northern boundary of the application site at 4 metres AGL.

3.03 Noise measurements were made in a free field environment using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. A windshield was fitted for all measurements. The calibration of each measurement system was verified immediately before and after the survey 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 octave band L_{eq} levels. Table 3.1 presents a summary of the measurement data for each measurement session, at each measurement position, rounded to the nearest decibel.

Continued from page 2

Table 3.1 – Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	Comment
MP1	30/07/20	1111-1200	58	38	62	Vehicles on Church Lane Distant road traffic on Cowlersley Lane
		1200-1226	60	40	63	
		1303-1318	59	39	63	
		2310-0000	50	28	46	
Daytime noise level 60 dB $L_{Aeq\ (0700\text{-}2300)}$ based on CRTN methodology Night time noise level circa 52 dB $L_{Aeq\ (2300\text{-}0700)}$ based on TRL methodology Maximum noise level of passing vehicles measured up to 75 dB L_{AFMax} at night						
MP1A	30/07/20	1229-1259	53	38	57	Vehicles on Church Lane Distant road traffic on Cowlersley Lane (Cricket match noted during measurement, no significant noise)
Daytime noise level circa 53 dB $L_{Aeq,\ T}$						
MP2	30/07/20	1329-1344	44	37	45	Distant road traffic on Church Lane and Cowlersley Lane
Daytime noise level circa 44 dB $L_{Aeq,\ T}$						
MP3	30/07/20	1352-1437	46	40	48	Vehicles on Hazel Grove Distant road traffic on Church Lane (Bowls match noted during measurement, no significant noise)
		1512-1528	46	39	48	
		2125-2137	38	33	42	Vehicles on Hazel Grove Distant road traffic on Church Lane (Bowls club open, no significant activity notes)
		2138-2258	42	31	44	
Daytime noise level circa 38-46 dB $L_{Aeq,\ T}$						
MP4	30/07/20	1445-1500	41	37	43	Vehicle passes on Kinder Avenue Distant road traffic on Church Lane
Daytime noise level circa 41 dB $L_{Aeq,\ T}$						

3.05 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

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

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

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

3.07 Based on the above formula, the daytime ambient noise level at MP1 is measured / calculated at **60 dB $L_{Aeq\ (0700–2300)}$.**

Continued from page 3

3.08 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)

3.09 Based on the above formula, the night time ambient noise level at MP1 is measured / calculated at **52 dB $L_{Aeq\ (2300–0700)}$**.

3.10 The noise environment at the application site was characterised by road traffic on Church Lane and distant road traffic on the surrounding road network, with no other significant noise sources noted during the survey.

3.11 With reference to the Broad Oak Cricket Club to the west of the application site, during the course of the noise survey it was observed that the cricket pitch was in use; however, no significant noise sources associated with the cricket game were noted. It should also be considered that the use of the cricket pitch is seasonal, typically restricted to summer months and daytime hours.

3.12 With reference to the Broad Oak Bowling Club to the north-west of the application site, during the course of the noise survey it was observed that the Bowls green was in use; however, no significant noise sources associated with the Bowls game were noted. It should also be considered that the use of the bowling green is seasonal, typically restricted to summer months and daytime hours only.

3.13 Both the Cricket and Bowling clubs have licenced premises on site (i.e. within the club houses). However, the presence of the existing dwellings in the immediate vicinity of the premises already imposes a constraint in terms of the level of noise those sources can emit without causing disturbance to the local community. For reference the cricket club house is circa 135 metres away from the application site boundary with existing residential dwellings located adjacent to the club house. The bowling club house is circa 25 metres away from the application site boundary with neighbouring existing residential dwellings with gardens backing onto the bowling club, circa 7 metres away.

Coronavirus Travel Restrictions

3.14 During March 2020 the UK Government announced measures to stem the coronavirus pandemic, including restrictions on non-essential travel. Although initially traffic volumes were initially reduced to circa 40 % of typical flows, more recent traffic data within the localised area indicates that traffic flows by the end of June 2020 were circa 65 % of typical traffic volumes and rising.

3.15 This trend is consistent with data produced by the AA in June 2020, which indicated that traffic volumes had recovered to circa 75 % of typical traffic volumes. Using the methodology in the Calculation of Road Traffic Noise (CRTN), a 25 % reduction in traffic volumes equates to a 1 dB reduction in noise levels – this correction is robustly applied to the measured noise level across the application site.

4.00 NATIONAL PLANNING POLICY FRAMEWORK AND OTHER RELEVANT GUIDANCE

National Planning Policy Framework

4.01 The National Planning Policy Framework (NPPF) was updated in 2019 and sets out the Government's planning policies for England and how these are expected to be applied.

4.02 Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 170 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

4.03 Paragraph 180 advises that:

'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…..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'.

4.04 The NPPF also refers to the DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

Noise Policy Statement for England

4.05 The Noise Policy Statement for England (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision is supported by the following aims:

- Avoid significant adverse impacts on health and quality of life.
- Mitigate and minimise adverse impacts on health and quality of life.
- Where possible, contribute to the improvement of health and quality of life.

4.06 NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur.

Planning Practice Guidance – Noise

4.07 Planning Practice Guidance (PPG) is an online resource (last updated 2019) which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur.
- Whether or not an adverse effect is occurring or likely to occur.
- Whether or not a good standard of amenity can be achieved.

4.08 In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL although the PPG acknowledges that:

'…the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation'.

Continued from page 5

4.09 The PPG also provides general advice on the typical options available for mitigating noise. It goes on to suggest that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

'Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed'.

ProPG Planning and Noise: New Residential Development

4.10 ProPG Planning and Noise: New Residential Development (ProPG) was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

4.11 Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233) (see table below).

Table 4.1 – Indoor Ambient Noise Levels in Dwellings

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700–2300)}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq\ (0700–2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700–2300)}$	30 dB $L_{Aeq\ (2300–0700)}$ 45 dB $L_{AFMax\ (2300–0700)}$

4.12 Note 4 to the above table states:

'A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night.'

4.13 Note 5 to the above table states:

'Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7'.

4.14 This is consistent with the guidance contained within the PPG, which states that:

'… 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'.

4.15 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 $L_{Aeq\ (2300–0700)}$.

Continued from page 6

4.16 On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed residential development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ during the daytime.
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ and 45 dB L_{AFMax} not regularly exceeded during the night time.

4.17 With regard to external amenity, BS 8233 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

Southern Boundary (Church Lane)

5.01 The design noise levels on the southern boundary (Church Lane) of the application site, including the +1 dB L_{Aeq} correction for 'atypical' traffic flows (see paragraph 3.11) are as follows:

- **≤ 61 dB $L_{Aeq,T}$** during the daytime.
- **≤ 53 dB $L_{Aeq,T}$** during the night time.
- **≤ 75 dB L_{AFMax}** passing road traffic

5.02 It is recommended that dwellings fronting onto Church Lane are provided with standard double glazing and mechanical ventilation (see Table 5.1 for specification).

Remaining Dwellings Across the Application Site

5.03 Measured noise levels across the remainder of the application site decreased with increased distance from Church Lane to the south.

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

5.05 It is recommended that dwellings setback / screened from Church Lane be provided with standard double glazing and standard trickle vents (see Table 5.1 for specification).

Continued from page 7

Glazing Specification

5.06 Internal noise levels have been calculated with closed windows. Calculations have incorporated:

- The measured/calculated external noise level data acquired on site.
- The noise ingress calculation methodology outlined in Annex G.2 of BS8233:2014.
- An assumed room volume of 50 m^3 with a glazing area of 3 m^2 for living rooms.
- An assumed room volume of 25 m^3 with a glazing area of 1.5 m^2 for bedrooms.
- An assumed typical masonry external wall construction (e.g. 250mm – 300mm solid masonry or 100mm brick / 100mm cavity / 100mm block).
- An assumed reverberation time of 0.5 seconds for living rooms and bedrooms.

5.07 In order to calculate the sound insulation requirements the Building Research Establishment (BRE) building envelope insulation calculation spreadsheet was used. This spreadsheet is based on the calculation methodology advocated in BS 8233. The spreadsheet allows input of external noise levels, room dimensions and reverberation time together with parameters for the various elements of the building envelope and calculates the internal noise level in terms of the external noise level metric (L_{Aeq} and L_{AFMax} in this case)

5.08 An indicative scheme of sound insulation is summarised in Table 5.1.

Table 5.1 – Scheme of Sound Insulation Works

Location	Noise Level	Internal Criteria	Glazing and Ventilation
Dwellings on the southern boundary (Church Lane) Plots 1 & 157	≤ 61 dB $L_{Aeq, day}$ ≤ 53 dB $L_{Aeq, night}$ ≤ 75 dB L_{AFMax}	≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 30 dB $L_{Aeq\ (2300–0700)}$ ≤ 45 dB $L_{AFMax\ (2300–0700)}$	Standard glazing rated at 29 dB R_w i.e. 4 / (6-20) / 4 and Mechanical Ventilation*
Remaining dwellings across the application site (set back / screened from Church Lane)	Standard glazing rated at 29 dB R_w i.e. 4 / (6-20) / 4 and standard trickle vents**		

*appropriate ventilation strategies outlined in paragraph 5.10, to be confirmed by the developer.

** Standard trickle vents rated at least 32 dB $D_{n,e,w}$+C per 5000 mm² EA in open position, (note: 1 no. required per habitable room) – ventilation requirements to be confirmed by developer.

5.09 For dwellings fronting onto Church Lane and not set back (plots 1 & 125), as the façade sound reduction scheme relies on windows being kept closed, an alternative means of whole dwelling ventilation (as defined in Approved Document Part F – Ventilation) is required, in accordance with BS 8233.

5.10 It is recommended that the proposed dwellings fronting onto Church Lane and not set back include a decentralised mechanical extract ventilation (dMEV) system or a mechanical extract ventilation (MEV) system or a positive input ventilation (PIV) system. For these systems, in dwellings where the designed air permeability is tighter than (<) 5 $m^3/(h.m^2)$, 2500 mm^2 EA background ventilators are required. In order to maintain the sound insulation properties of the façade, any trickle vents should be rated at least **40 dB $D_{n,e,w}+C_{tr}$** per 2500 mm^2 EA (vent open), such as the Greenwood 2500EAW.AC1, or equivalent.

Purge Ventilation – All Locations

5.11 There is no requirement to comply with internal noise guidelines when windows are opened for temporary purge ventilation (to enable discretionary rapid air changing). In such instances, resultant internal levels would exceed the internal noise guidelines but this would normally be on a brief, temporary basis.

Continued from page 8

External Amenity (Gardens)

5.12 Indicative plans show that the majority of the gardens are setback from Church Lane. However, where gardens are not setback, it is recommended that they are screened from Church Lane with a 1.8 metre solid timber fence (plots 1-2 & 124 -125, see appendix 3 for boundary treatments).

5.13 The fence should be built from close-boarded timber fencing (mass per unit area $\geq$ 10kg/m^2). The fence should have no gaps or holes and should be fully sealed at the ground (i.e. include a gravel board).

5.14 The provision of the 1.8 metre solid timber fences should serve to reduce external noise levels to below 50 dB $L_{Aeq,T}$ thus satisfying the 'desirable' guideline value for external amenity areas, as recommended by BS8233 / ProPG across the entire application site.

6.00 CONCLUSIONS

6.01 A noise impact assessment has been undertaken for a proposed residential new build development at Broad Oak Farm, land north of Church Lane, Linthwaite, Huddersfield.

6.02 The noise environment at the application site was characterised by road traffic on Church Lane and distant road traffic on the surrounding road network, with no other significant noise sources noted during the survey.

6.03 A scheme of sound insulation works has been developed to protect the proposed residential development from the ambient noise climate.

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

Richard Whitaker BSc (Hons)
MIOA, Diploma in Acoustics & Noise Control
For 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 - Noise Monitoring Positions

Appendix 3 – Boundary Treatments

=1.8 metre solid timber fence

Appendix 4 – Proposed Plots with Mechanical Ventilation

=Standard glazing and mechanical ventilation