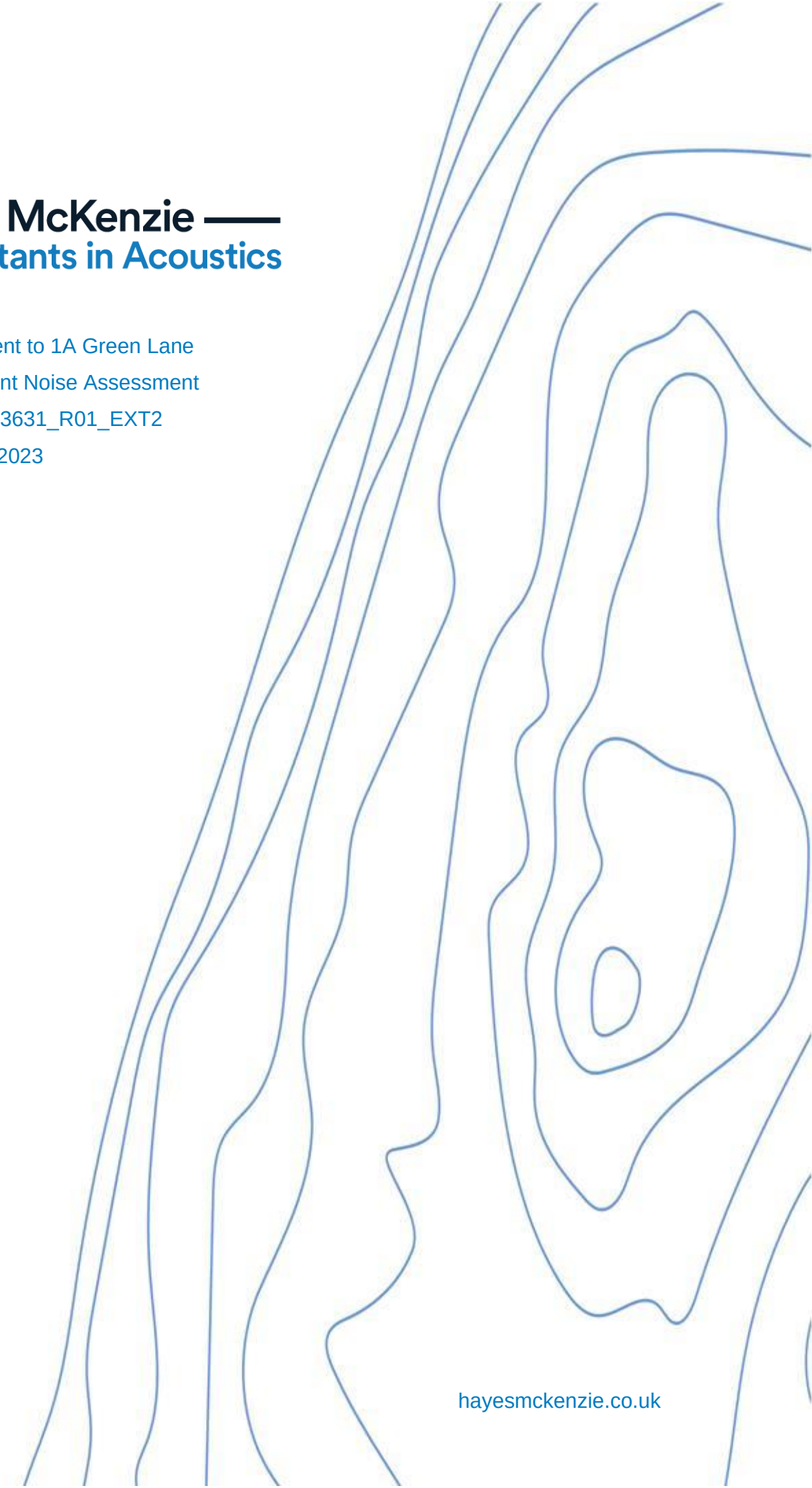
Hayes McKenzie
Consultants in Acoustics

Land Adjacent to 1A Green Lane
Entertainment Noise Assessment
Report HM: 3631_R01_EXT2
30 October 2023



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Prepared for:	James Mitchell Windfall, The Thicket, Maidenhead, SL6 3QE
Report prepared by:	Seth Roberts BEng, MIOA Principal Acoustic Consultant
Checked by:	Robin Woodward BSc, MIOA Principal Acoustic Consultant
Approved by:	Seth Roberts BEng, MIOA Principal Acoustic Consultant

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Unit 3, Oakridge Office Park, Whaddon, Salisbury SP5 3HT, UK
+44 (0)1722 710091, salisbury@hayesmckenzie.co.uk

1. INTRODUCTION

1.1 A housing development on Land Adjacent to 1A Green Lane, Codford has been granted consent and as part of the planning obligations, an assessment of entertainment noise is required. Hayes McKenzie have been commissioned by James Mitchell to carry out an entertainment noise assessment in order to discharge the relevant planning condition.

1.2 A theoretical assessment has been carried out on the basis of potential entertainment noise emanating from within the neighbouring licensed premises. The current usage of the adjoining site is not generating any entertainment noise and the assessment is based on reasonable worst-case assumptions, should the licensed premises reopen.

2. PLANNING INFORMATION

2.1 Planning permission was sought for the housing development on Land Adjacent to 1A Green Lane in 2020 and was granted consent in January 2021 (Wiltshire Council planning ref. 20/07505/FUL). Condition 2 of this planning consent was a pre-commencement condition requiring a noise assessment relating to entertainment noise from the neighbouring licensed premises (The George Hotel).

2.2 Since the George Hotel has not traded as a public house for a number of years, it was unclear how to assess entertainment noise and a section 73 application to remove the planning condition was made last year (Wiltshire Council planning ref. PL/2022/07099). Following this application an alternative decision notice was approved with a revised version of the condition. The condition was altered (and renumbered) to be a pre-occupation conditioning, allowing the development to commence without the need to discharge the condition. Condition 4 of this decision notice states:

'The dwellings hereby permitted shall not be occupied until a scheme for protecting the occupants of the development against noise from activities associated with the licenced

premises including amplified music and people noise, has been submitted to and approved by the Local Planning Authority. The approved scheme shall be implemented in full before residential occupancy is brought into use and the said scheme is maintained at all times thereafter.'

2.3 Earlier this year, there was still no indication that The George Hotel might start trading again and it remained unclear how entertainment noise could be assessed so another section 73 application was made to alter or remove the planning condition (Wiltshire Council planning ref. PL/2023/04401). The application highlighted that planning consent for a property adjoining The George Hotel (The Corner House) was granted 10 years ago, at which time the property was still part of the licensed premises. The planning application for The Corner House (13/03716/FUL) was submitted by Edward Toomer of Four County Inns Ltd and at the time, The George Hotel was still operating as a public house. The planning consent for The Corner House included a requirement for a 2 m high boundary fence and a suitable level of sound insulation for the shared party wall. On this basis, Hayes McKenzie recommended to: '*either remove the condition altogether or to revise it such that it is only required to build a 2-metre-high fence, bringing it in line with the planning obligations associated with The Corner House*'. The latest section 73 application was refused at the end of July 2023 and the planning condition set out at paragraph 2.2 above remains in place.

Reasons for Condition

2.4 Prior to the first section 73 application in 2022, an inquiry was sent to the planning team at Wiltshire Council to inquire about the reasons for including the noise condition. In an email response from Joanne Parker dated 8th September 2022, it was advised that an Environmental Health Officer had requested the condition (and it was imposed) on an earlier planning permission for housing on the site. It is presumed that this was referring to the outline planning permission that was granted consent in 2018 (18/12072/OUT) which has an identical condition attached to the decision notice (condition 10). In the comments from environmental health associated with the outline planning permission, the condition is recommended and the following reason is given:

'*The licenced premises currently has a licence to play amplified music between 1000hrs and 0000hrs daily, plus additional hours on bank holiday weekends and public holidays. When considering this application we have to take into consideration that the Licenced Premises can be operated fully in accordance with the Premises Licence, and the potential impact of those activities on future occupants of the residential properties*'

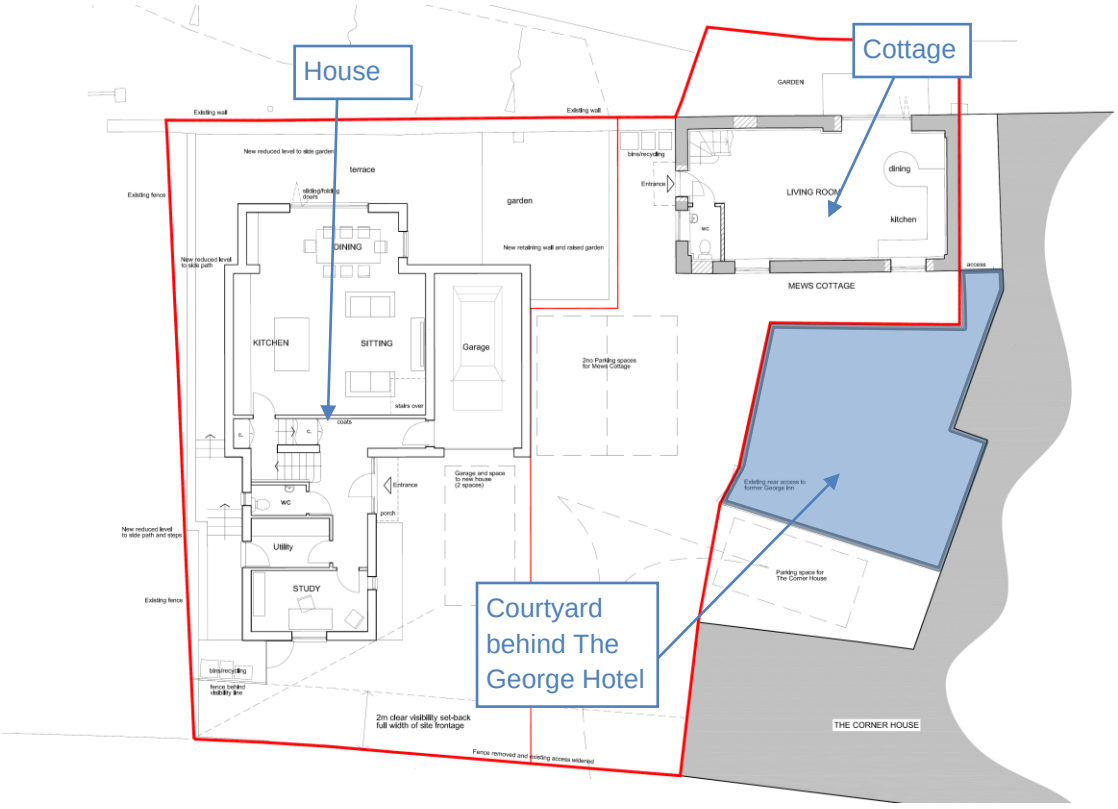
2.5 Additional information has been requested regarding the nature of the premises license

and in a telephone conversation on 11th July 2023, Senior Public Protection Officer, Trish Morse advised that the conditions of the license indicate that recorded music is allowed indoors up until 23:00. It was also discussed that live music is also allowed under the live music act but that it is very unlikely this would happen outside as the courtyard of The George is now very small.

3. DEVELOPMENT LAYOUT

3.1 The development is in two distinct parts; the main house, and a smaller cottage which is formed from a former bowling alley to the rear of The George Hotel. The cottage is adjacent to the courtyard behind The George Hotel whilst the main house is situated further away (to the north) as shown at Figure 1 below.

Figure 1: Location Plan



3.2 To the rear of The George Hotel, there are only three areas where amplified music noise could potentially escape from within and these are all located on the facades facing out into the courtyard. The three areas are a back door, a kitchen door and a kitchen window all of which are shown in the photograph at Figure 2.

Figure 2: The George Hotel Courtyard – Photograph



3.3 Within the development, there is only one window in the main house with a direct line of sight towards the courtyard at the rear of The George Inn, and this is a small window in the study on the ground floor. There is also a window in the dining room facing towards the courtyard but it is well screened by the layout with a very limited line of sight. At first floor level in the house, there are a couple of small non noise-sensitive windows which are the closest to the courtyard (landing and en-suite) and the next closest is a window in bedroom 3 with no direct line of sight. The locations of these key noise sensitive windows within the main house are used for the assessment and are labelled on floor plans at Figure 3.

3.4 The cottage is much closer to the courtyard at the rear of The George Inn (compared to the main house) and all four windows on the west façade are immediately adjacent to the boundary. Since the ground floor of the cottage is an open plan kitchen/diner, the kitchen window is considered to be noise sensitive and this is the closest window to the courtyard at this level. At first floor level within the cottage, the dormer window in bedroom 2 is the closest and this overlooks the courtyard. The locations of these key noise sensitive windows within the cottage are used for the assessment and are labelled on floor plans at Figure 4.

Figure 3: Floor Plans – House

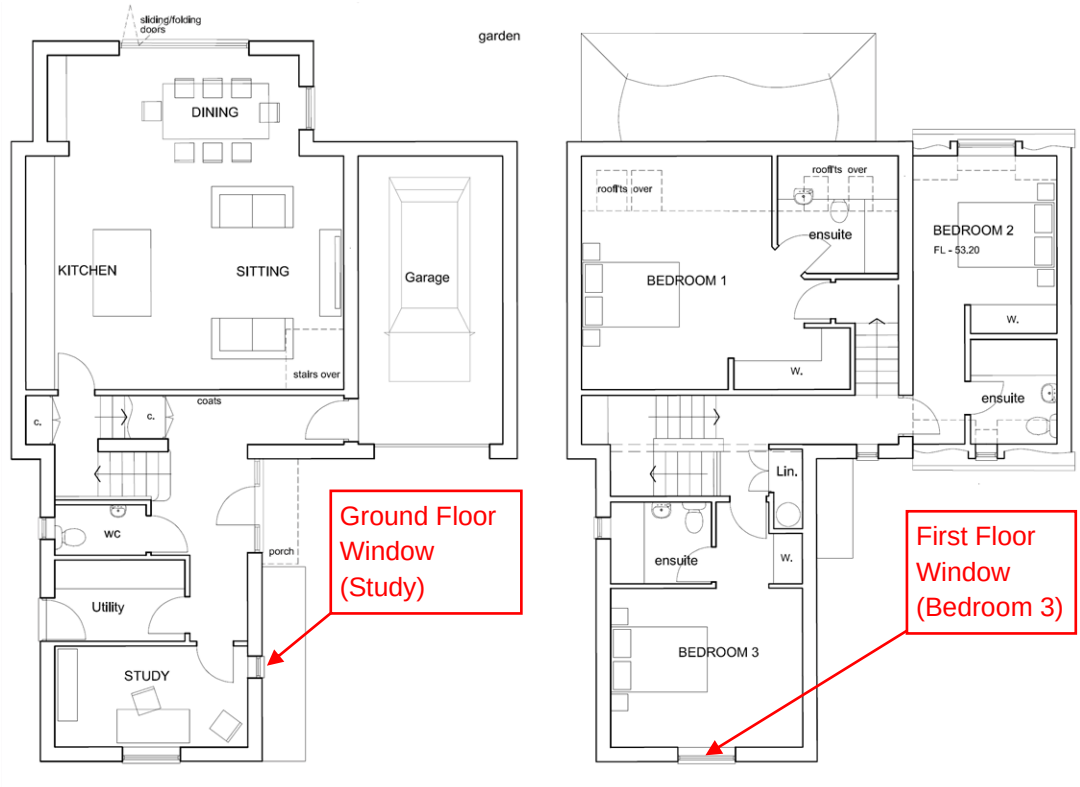
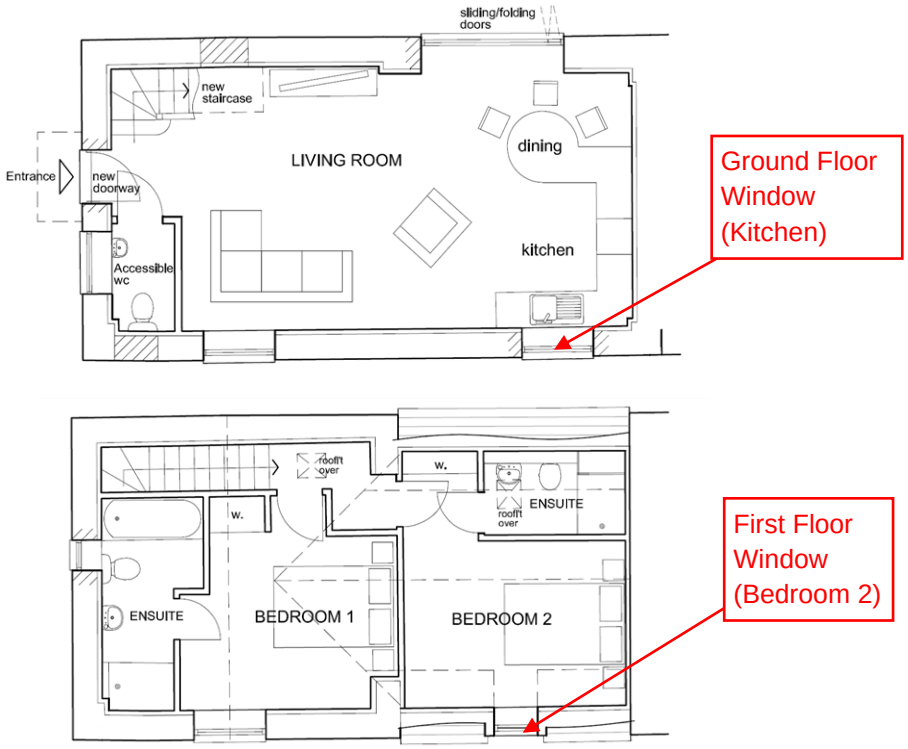


Figure 4: Floor Plans – Cottage



3.5 For the purposes of assessing external amenity areas, the gardens for both the house and the cottage are located to the east of the buildings, on the other side, away from the courtyard. This is indicated on the figures where it can be seen that sliding doors are marked providing access into the gardens.

4. RELEVANT GUIDANCE

4.1 Whilst there are various guidance documents relating specifically to concerts and live music venues, these are typically aimed at setting suitable noise limits for venues in order to control the frequency and volume of noise at source. Since noise from the adjacent licensed premises is outside the control of the developer, it is more appropriate to consider assessment of commercial noise and suitable ambient noise levels at residential dwellings.

BS4142:2014+A1:2019, Methods for rating and assessing industrial and commercial sounds

4.2 BS 4142 provides an assessment methodology for rating noise immission levels from industrial and commercial sources at residential properties. The standard describes a method for determining the noise impact based on the difference between the existing background sound level (without the noise source) measured using the L_{A90} measurement index[1] and a 'rating level' of the noise immission (from the source at a receiver location) which is derived from the measured or predicted 'specific sound level' (defined using the L_{Aeq} index[2]) plus any penalty for tonal or impulsive characteristics. If the specific sound level exhibits an identifiable character such as tonality or impulsiveness, then a variable penalty of up to 6 dB or 9 dB respectively is added to give the rating level.

4.3 The difference between the background sound level and the rating level (rating minus background) is then used to assess the noise impact, according to Table 1 below. BS 4142:2014 states that '*the lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact*'.

[1] Noise level measured in dBA exceeded for 90% of the measurement period

[2] Noise level measured in dBA energy averaged over the measurement period

Table 1 – BS 4142 Guidance on Noise Impact

Difference	Assessment
Around +10 dB or more	Indication of a significant adverse impact
Around +5 dB	Indication of an adverse impact
<0 dB	Indication of a low impact

4.4 Whilst BS 4142 gives an indicative assessment of the impact on residential amenity, there are no specific guidelines on what may be acceptable in a given situation and, in this respect, the standard is left open to interpretation.

4.5 Section 7 of the standard provides guidance on determination of the specific sound level. It is noted that, where measurement of the specific noise level is not possible, then this can be determined by calculation. It also describes how the specific noise level is quantified as an L_{Aeq} over the 'reference time interval' which means that, where it is not continuous, it is necessary to correct the measured noise level, taken during periods when the source is operating, for the percentage 'on-time' within the relevant reference time interval. The standard details different reference time intervals for the day-time and night-time of 1 hour and 15 minutes respectively.

4.6 Section 8 provides guidance on determination of the background noise level. It is noted that there is no 'single' background sound level as this is a fluctuating parameter. As a result, it is recommended that a series of sequential or disaggregated measurements, of duration not normally less than 15 minutes, are carried out to determine a 'representative' level which is then used as the basis of the assessment. It is noted that the data should suitably represent the particular circumstances and periods of relevance to the assessment and that weekday and weekend periods may need to be considered separately. Levels are to be reported as integer values to reflect the variability of such measurements.

BS 8233, Guidance on sound insulation and noise reduction for buildings

4.7 BS 8233:2014[3] provides guidance on suitable internal noise levels for different types of buildings, including various home and office spaces with different uses. Section 7.7.1 of the standard incorporates World Health Organisation (WHO) guidance[4] on acceptable noise levels for residential dwellings which is stated to be based on annual average noise levels, assuming typical diurnal variation. The provided levels contribute to design criteria for living rooms and bedrooms which are specified in a table (Table 4 in the standard). An

3 British Standards, 2014, BS 8233 "Guidance on sound insulation and noise reduction for buildings"
4 World Health Organization, 1999, "Guidelines for Community Noise"

extract of this table is given below in Table 2:

Table 2 – Extract from BS8233, Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Footnote 4 to this table states that:

'Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. 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'.

4.8 It should be noted that, in relation to sleep disturbance, the previous version of the standard (BS8233:1999) provided a guideline limit of 45 dB L_{Amax} within bedrooms at night and this was supported by the WHO guidelines for community noise (also published in 1999). Since 1999, the WHO has published '*Night Noise Guidelines For Europe*' in 2009 which acknowledges that sleep disturbance cannot be easily linked to a single maximum noise level (as it depends on a number of other factors) but that an internal noise level of **42 dB L_{Amax}** is recommended as an upper threshold value for No Observed Effect Level (NOEL) in relation to transportation noise. The latest WHO document, '*Environmental Noise Guidelines for the European Region*' published in 2018 does not offer any further information on maximum noise levels and refers to existing guidance. Within the latest version of the standard (BS8233:2014), it is noted that:

'…where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target noise levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved'.

4.9 A further footnote goes on to say that:

'…if relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise levels'.

4.10 It should also be noted, that in relation to alternative ventilation, at paragraph 8.4.5.4, the standard states:

The Building Regulations' supporting documents on ventilation [48, 49, 50] recommend

that habitable rooms in dwellings have background ventilation. Where openable windows cannot be relied upon for this ventilation, trickle ventilators can be used and sound attenuating types are available. However, windows may remain openable for rapid or purge ventilation, or at the occupant's choice.

4.11 The standard also provides guideline values for external noise levels (i.e. in gardens and patios) stating that 50 dB $L_{Aeq,T}$ is desirable and that 55 dB $L_{Aeq,T}$ should be regarded as an upper limit in noisier external environments. However, the standard goes on to state that:

'…it is also recognised 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 that 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 spaces, but should not be prohibited.

5. SOURCES OF NOISE AND METHODOLOGY

5.1 Codford is relatively close to the A36 and road traffic from this route is the main source of noise contributing to the noise environment within the village.

Road Traffic Noise

5.2 The European Noise Directive[5] requires member states to identify noise pollution levels in several areas including major roads and have the results publicly available with an aim to prevent and reduce environmental noise where necessary.

5.3 The UK has carried out strategic noise mapping in line with the requirement of this directive and although this is a little out of date, it is still considered to provide a good indication of road transportation noise. The latest results of this noise mapping were published in 2015

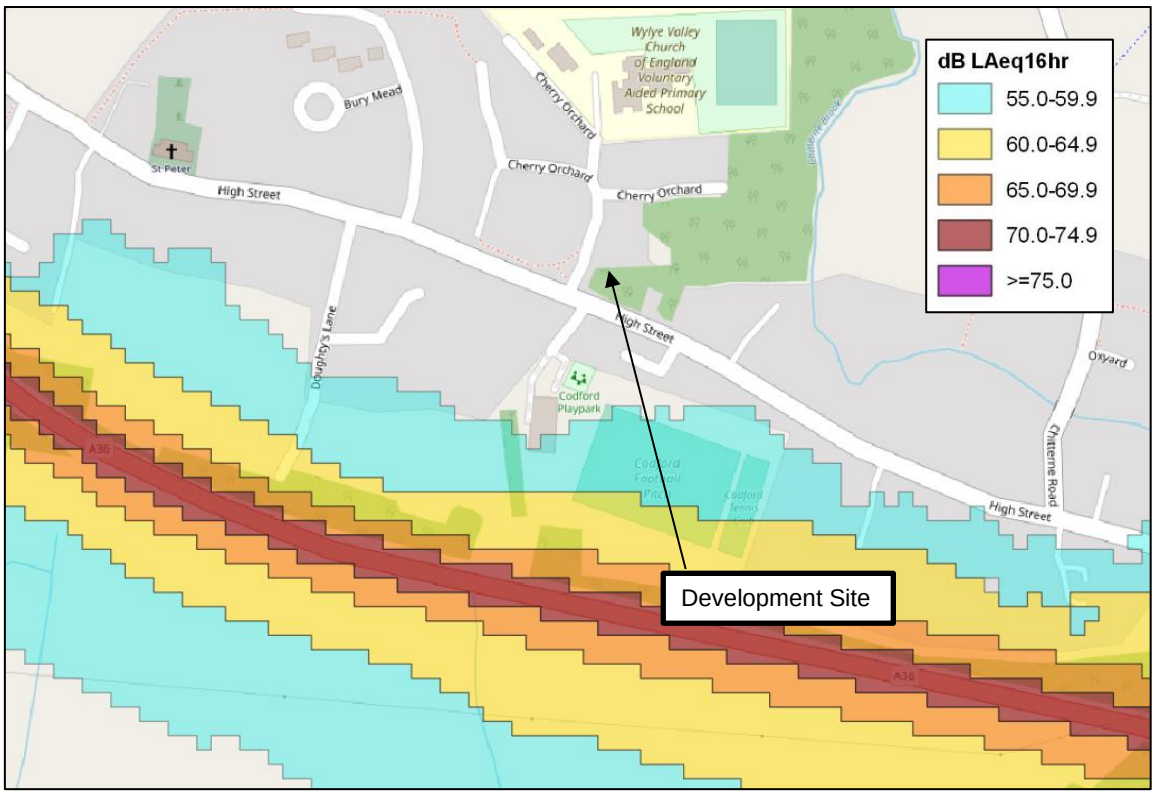
5 European Noise Directive - Directive 2002/49/EC – https://ec.europa.eu/environment/noise/directive_en.htm - accessed 04/10/2023

and are freely available on the government website[6]. Hayes McKenzie have used this dataset to provide an indication of the levels of road traffic noise at the site.

5.4 Figure 5 shows an extract of the strategic noise model dataset for daytime road traffic noise covering the locality surrounding The George Hotel, Codford. It can easily be seen that the level at the development site is expected to be below **55 dB $L_{Aeq, 16\text{-hour}}$**, and given the topography and buildings providing screening it seems likely that it would be below **50 dB $L_{Aeq, 16\text{-hour}}$** at the development site.

5.5 Figure 6 shows an extract of the strategic noise model dataset for night-time road traffic noise covering the locality surrounding The George Hotel, Codford. It can easily be seen that the level at the development site is expected to be below **50 dB $L_{Aeq, 8\text{-hour}}$**, and given the topography and buildings providing screening it seems likely that it would be close to **40 dB $L_{Aeq, 8\text{-hour}}$** at the development site.

Figure 5: Road and Rail Traffic Noise Level ($L_{Aeq, 16\text{-hour}}$) map (Daytime)



6 https://www.gov.uk/government/publications/open-data-strategic-noise-mapping

Figure 6: Road Traffic Noise Level ($L_{Aeq, 8\text{-}hour}$) map (Night)



Live or Amplified Music

5.6 Condition 4 of the planning consent specifically refers to noise: '*including amplified music and people noise*' and since the adjacent licensed premises is not currently operating as a public house, these noise sources cannot be measured directly. However, based on previous measurements conducted by Hayes McKenzie of loud amplified music within a wedding venue, it has been possible to estimate worst-case levels of noise emitted from within the adjacent licensed premises. To provide an absolute worst-case, it has been assumed that music would be at the same level throughout the building (even within the pub kitchen) and that windows are open for ventilation. Noise breakout from the building envelope has been modelled using the method outlined in BS EN ISO 12354-4(2000)[7], and Sound Reduction Index (SRI) data for an open window taken from NANR116[8].

5.7 In summary, a music noise level of **91 dB L_{Aeq}** is assumed within The George Hotel, a sound reduction index of **16 dB R_w** is assumed through windows opened for ventilation and an external sound level at 1m from the building façade of **73 dB L_{Aeq}** is expected.

[7] BS EN ISO 12354-4:2000, Building Acoustics – Estimation of Acoustic Performance of buildings from the performance of elements, *part 4 – Transmission of indoor sound to the outside*, BSI, 2000

[8] NANR116: '*Open/Closed Window Research' Sound Insulation through Ventilated Domestic Windows*; The Building Performance Centre, School of The Built Environment, Napier University: Edinburgh, UK, 2007.

Conversation Noise

5.8 A recent study into speech noise levels[9] generated through conversation in different noise environments presents accurately measured sound pressure levels averaged across a number of male and female voices. For the purposes of this assessment measured speech noise levels (taken from this study) during typical dinner party background noise have been used to calculate likely noise levels due to conversation noise at the proposed venue.

5.9 To summarise, an average of **66 dB L_{Aeq}** (representative of loud conversation levels at 1 m) has been assumed throughout. As a worst-case it is possible that patrons could be using the courtyard and generating this noise level outside, immediately adjacent to the boundary with the residential development. This level of conversation noise inside The George Hotel immediately adjacent to an open window (using same methodology as for music noise) will result in a level of **49 dB L_{Aeq}** at 1 m from the building façade.

5.10 Whilst it is possible that multiple people could be talking at once, it is considered that the number of patrons at this venue would not be enough to generate significant overlap in conversation noise (and increase in level).

Derivation of Suitable Assessment Criteria

5.11 Given the likely levels of road traffic noise at the site and the fact that the cottage is within a few metres of the courtyard, it is apparent that worst case music noise levels could be in the region of 20 dB higher than other ambient sounds. Background sound levels would be lower than ambient sound levels and an even larger difference could therefore be expected between background sound levels and worst-case music noise levels. It is therefore clear that BS4142 methodology indicates a significant adverse impact (see Table 1) and there is little point in conducting background sound measurements to confirm this.

5.12 In order to mitigate the likely adverse impact, the developer has no control over the noise source and there are only two ways this can be addressed:

- An acoustic barrier to reduce external noise levels in the amenity areas immediately outside the residential buildings.
- Glazing and ventilation specifications to reduce internal noise levels within residential buildings.

5.13 For external amenity areas, it is considered that an acoustic barrier could be specified to

[9] Conversational speech levels and signal-to-noise ratios in realistic acoustic conditions, Adam Weisser, and Jörg M. Buchholz, The Journal of the Acoustical Society of America 145, 349 (2019); doi: 10.1121/1.5087567

ensure that the guideline upper limit of 55 dB $L_{Aeq, T}$ from BS 8233 is met (see paragraph 4.11).

5.14 Within residential buildings, glazing and ventilation specifications could be used to ensure that internal levels do not exceed 35 dB $L_{Aeq, T}$ within ground floor living spaces and 30 dB $L_{Aeq, T}$ within bedrooms. This would then guarantee that the recommended levels for long term average daytime and night noise levels in BS 8233 (see Table 2) are met. It should also be noted that the license only permits amplified music until 23:00 (see paragraph 2.5) so it is very much worst-case to consider the night time period in relation to amplified music.

6. PREDICTED NOISE LEVELS

6.1 The breakout calculations for conversation noise and music noise levels described at paragraphs 5.6 through to 5.10 have been applied to the layout of The George Inn. The methodology has been used to define expected noise levels at 1 m from the back door, kitchen door and kitchen window (shown at Figure 2) assuming noise attenuation through an open window. The results of these breakout calculations have then been used to calibrate a noise model for calculating propagation beyond 1 m. The model assumes point sources at a height of 1.5 m positioned in the middle of each of the three breakout areas. Also, for the purposes of modelling worst-case conversation noise within the courtyard itself, an additional point source at a height of 1.5 m has been included to represent a table close to the nearest windows. The extant 2 m high fence around the courtyard (shown at Figure 2) is also included in the noise model.

6.2 Detailed noise predictions have been carried out in accordance with ISO 9613:2 *Acoustics, Attenuation of Sound During Propagation Outdoors* implemented through the use of CadnaA noise modelling software. It should be noted that noise contours and prediction points use receiver heights of 1.5 m and 4 m to provide predictions representative of ground and 1st floor windows respectively.

6.3 The assumed source sound levels for music noise and conversation noise, in 3rd octave bands, are detailed at Appendix A. It should be noted that for the purposes of the breakout calculations and the noise modelling, the 3rd octave band data needed to be converted to octave bands and detailed results of predicted noise levels at each of the prediction points are included at Appendix A along with noise contours.

6.4 At the house, conversation noise levels of no more than 44 dB L_{Aeq} and 39 dB L_{Aeq} at the study and bedroom windows respectively. At the cottage, conversation noise levels of no more than 56 dB L_{Aeq} and 64 dB L_{Aeq} at the kitchen and bedroom windows respectively.

6.5 At the house, music noise levels of no more than 55 dB L_{Aeq} and 52 dB L_{Aeq} at the study and bedroom windows respectively. At the cottage, music noise levels of no more than 65 dB L_{Aeq} and 66 dB L_{Aeq} at the kitchen and bedroom windows respectively.

7. NOISE IMPACT ASSESSMENT

7.1 For external amenity areas, it can be seen from the noise contour figures included at Append A, that noise levels (at ground floor level) within the gardens of both the house and the cottage are below 55 dBA. This meets the criteria set out at paragraph 5.13 and it is not considered that any further mitigation in the form of additional noise barriers should be required.

House – Windows Open for Ventilation

7.2 Assuming 15 dB of attenuation through a window opened for ventilation, day-time and night-time music noise levels at the house reduce to internal levels of 40 dB L_{Aeq} and 37 dB L_{Aeq} for day and night respectively. Conversation noise levels at the house would reduce to internal noise levels of 35 dB L_{Aeq} and 29 dB L_{Aeq} for the day and night respectively which meet the criteria for bedrooms and living rooms presented at paragraph 5.14. In order to meet the criteria in relation to music noise within the house, windows will need to be closed and the required glazing and ventilation specifications are specified in the following section.

Cottage – Windows Open for Ventilation

7.3 Assuming 15 dB of attenuation through a window opened for ventilation, day-time and night-time music noise levels at the cottage reduce to internal levels of 50 dB L_{Aeq} and 51 dB L_{Aeq} for day and night respectively. Conversation noise levels at the cottage would reduce to internal noise levels of 41 dB L_{Aeq} and 49 dB L_{Aeq} for the day and night respectively. Neither conversation noise nor music noise meet the criteria for bedrooms and living rooms presented at paragraph 5.14. In order to meet the criteria, windows will need to be closed and the required glazing and ventilation specifications are specified in

the following section.

Glazing and Ventilation Specifications

7.4 For all windows in the east façade of the cottage along with the study and bedroom windows in the house, the following specifications within Table 3 are recommended. It should be noted that all other windows and skylights within the development are either not noise sensitive or are sufficiently screened by the development layout such that they do not require mitigation.

Table 3 – Specification for Residential Windows

Location	Highest Predicted External Free Field Noise Level	Minimum weighted sound reduction index	Example Glazing & Ventilation Requirements
Bedroom and living room windows in east façade of the cottage	66 dB L_{Aeq}	35 dB R_W	Double glazing with 6mm glass, a standard 12 mm air gap and 8 mm glass on the other side. Acoustic Trickle Ventilation with open area of no more than 2500 mm^2 and D_{new} of at least 39 dB
Study windows and bedroom 3 window in house	55 dB L_{Aeq}	30 dB R_W	Standard double glazing with 4 mm glass and a standard 12mm air gap. Acoustic Trickle Ventilation with open area of no more than 8000 mm^2 and D_{new} of at least 33 dB

7.5 The above specifications result in music noise levels within the House of no more than 29 dB L_{Aeq} and music noise levels within the Cottage of no more than 30 dB L_{Aeq} which meet the criteria set out at paragraph 5.14. Conversation noise levels within the cottage would be lower still, reducing to no higher than 27 dB L_{Aeq} with these specifications.

7.6 Specifications for the proposed glazing to be installed in both the house and the cottage are included at Appendix B and it should be noted that this meets the recommended standards set out in Table 3.

7.7 An example of ventilation which meets the requirement of an open area of no more than 2500 mm^2 and D_{new} of at least 39 dB is the Greenwood AWV39 acoustic wall ventilator. An example of ventilation which meets the requirement of an open area of no more than 8000 mm^2 and D_{new} of at least 33 dB is the Greenwood HD slotvent.

8. CONCLUSIONS

8.1 An assessment of the worst-case potential music noise and conversation noise from The George Inn has been undertaken in order to determine suitable mitigation measures for the adjacent residential development currently under construction.

8.2 The recommended mitigation measures have been prepared to form a scheme suitable for discharging planning condition 4 attached to the consented development adjacent to The George Inn (Wiltshire Council planning ref. PL/2022/07099).

8.3 The results of an analysis of strategic noise mapping and the worst-case predictions indicate that a BS 4142 assessment would be likely to indicate an adverse impact.

8.4 Suitable assessment criteria have been determined based on the guidance within BS8233, *Guidance on sound insulation and noise reduction for buildings*. Mitigation measures in the form of glazing and ventilation specifications have been proposed for specific windows within both the house and the cottage that ensure the criteria are met.

Appendix A – Noise Prediction Results

Conversation Noise Prediction Results

	Third octave band levels (dBA)																					
Source	**50**	**63**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**	**L_{Aeq}**
Male voice	-10.2	-2.7	7.5	25.7	36.9	37.6	41.1	49.2	50.6	53.9	58.3	60.5	57.5	56.2	58.4	57.1	55.0	55.3	53.5	48.7	40.5	**67.3**
Female voice	-10.2	-6.2	0.3	6.6	11.9	23.6	39.2	46.0	44.4	50.2	54.4	56.1	57.5	56.2	56.3	57.1	56.5	55.3	51.6	48.7	43.5	**65.8**
Average @1m	-10.2	-4.1	5.2	22.7	33.9	34.8	40.3	47.9	48.5	52.4	56.8	58.8	57.5	56.2	57.5	57.1	55.8	55.3	52.7	48.7	42.3	**66.6**
Breakout level	**Converted to octave band levels for noise model**																					
Calculated @1m from an open window	-	-16.2	-	-	21.5	-	-	35.6	-	-	43.5	-	-	45.9	-	-	41.9	-	-	33.4	-	**49.2**
Predicted levels at windows																						
Kitchen Window	-	0.3	-	-	31.2	-	-	44.0	-	-	52.2	-	-	50.5	-	-	46.9	-	-	37.6	-	**55.6**
House Bedroom Window	-	-17.1	-	-	14.0	-	-	27.0	-	-	35.5	-	-	34.1	-	-	30.7	-	-	21.2	-	**39.0**
Cottage Bedroom Window	-	-1.1	-	-	31.4	-	-	47.2	-	-	58.8	-	-	59.2	-	-	58.1	-	-	51.5	-	**63.9**
Study Window	-	-13.7	-	-	17.6	-	-	30.9	-	-	39.8	-	-	39	-	-	36.3	-	-	27.4	-	**43.7**

Amplified Music Noise Prediction Results

	Third octave band levels (dBA)																					
Source	**50**	**63**	**80**	**100**	**125**	**160**	**200**	**250**	**315**	**400**	**500**	**630**	**800**	**1000**	**1250**	**1600**	**2000**	**2500**	**3150**	**4000**	**5000**	**L_{Aeq}**
Reverberant Music Noise Level	60.3	66.2	63.0	66.1	64.3	68.1	72.2	74.7	80.7	81.4	79.3	78.9	80.7	81.3	80.5	79.7	80.4	77.7	75.3	75.1	73.7	**90.8**
Breakout level	**Converted to octave band levels for noise model**																					
Calculated @1m from an open window	-	46.6	-	-	55.2	-	-	66.1	-	-	66.8	-	-	69.6	-	-	65.2	-	-	58.5	-	**73.5**
Predicted levels at windows																						
Kitchen Window	-	42.2	-	-	50.2	-	-	60.1	-	-	59.3	-	-	60.1	-	-	53.3	-	-	43.8	-	**65.1**
House Bedroom Window	-	29.0	-	-	37.0	-	-	47.0	-	-	46.5	-	-	47.6	-	-	41.0	-	-	31.4	-	**52.4**
Cottage Bedroom Window	-	37.9	-	-	47.0	-	-	59.0	-	-	59.7	-	-	62.4	-	-	57.8	-	-	50.8	-	**66.3**
Study Window	-	31.4	-	-	39.5	-	-	49.6	-	-	49.3	-	-	50.7	-	-	44.5	-	-	35.4	-	**55.3**



Project:

3631 Green Lane Codford

Title:

Figure 01: Predicted Music Noise Levels at Ground Floor height

Key

1.5m height LAeq

- 80
- 75
- 70
- 65
- 60
- 55
- 50

Scale @ A3: 1:150

Coordinate System: British National Grid

0 2.5 5 m

N

Date: 06-10-23	Prepared by: SJR	Checked by: SJR
Ref: F01	EXT1	

Drawing by:

Hayes McKenzie Partnership Ltd.
Unit 3, Oakridge Office Park,
Whaddon, Salisbury, UK SP5 3HT
+44 (0) 1722 710091

Hayes McKenzie
Consultants in Acoustics



Project:

3631 Green Lane Codford

Title:

Figure 02: Predicted Music Noise Levels at First Floor height

Key

4m height LAeq

- 75
- 70
- 65
- 60
- 55
- 50

Scale @ A3: 1:150

Coordinate System: British National Grid

0 2.5 5 m

N

Date: 06-10-23	Prepared by: SJR	Checked by: SJR
Ref: F02	EXT1	

Drawing by:
Hayes McKenzie Partnership Ltd.
Unit 3, Oakridge Office Park,
Whaddon, Salisbury, UK SP5 3HT
+44 (0) 1722 710091

Hayes McKenzie
Consultants in Acoustics



Project:

3631 Green Lane Codford

Title:

Figure 03: Predicted Conversation Noise Levels at Ground Floor height

Key

1.5m height LAeq

- 75
- 70
- 65
- 60
- 55
- 50

Scale @ A3: 1:150

Coordinate System: British National Grid

0 2.5 5 m

N

Date: 06-10-23	Prepared by: SJR	Checked by: SJR
Ref: F03	EXT1	

Drawing by:

Hayes McKenzie Partnership Ltd.
Unit 3, Oakridge Office Park,
Whaddon, Salisbury, UK SP5 3HT
+44 (0) 1722 710091

Hayes McKenzie
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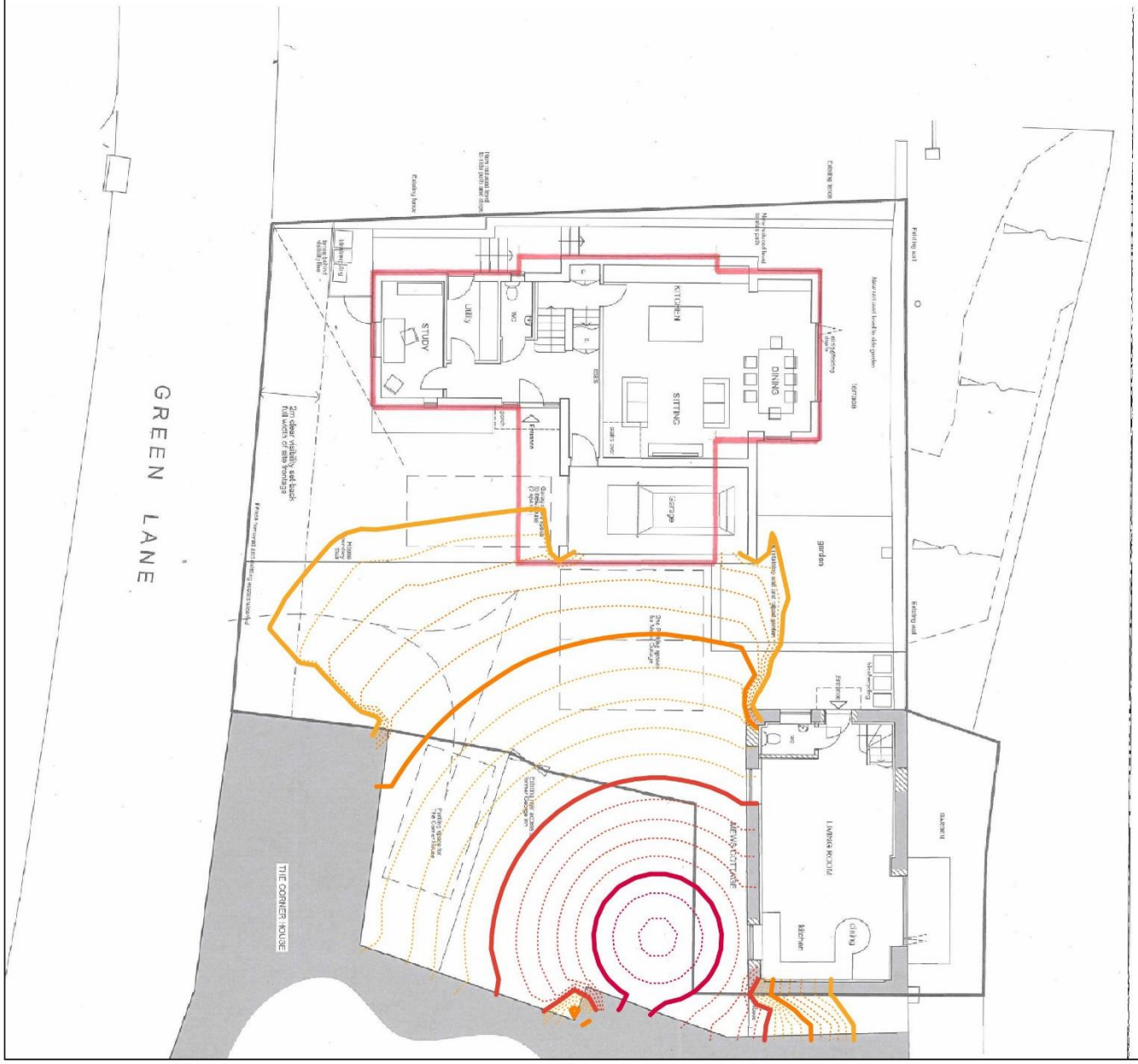

Project:

3631 Green Lane Codford

Title:

Figure 04: Predicted Conversation Noise Levels at First Floor height

Key

4m height LAeq

- 75
- 70
- 65
- 60
- 55
- 50

Scale @ A3: 1:150

Coordinate System: British National Grid

0 2.5 5 m

N

Date: 06-10-23	Prepared by: SJR	Checked by: SJR
Ref: F04	EXT1	

Drawing by:
Hayes McKenzie Partnership Ltd.
Unit 3, Oakridge Office Park,
Whaddon, Salisbury, UK SP5 3HT
+44 (0) 1722 710091

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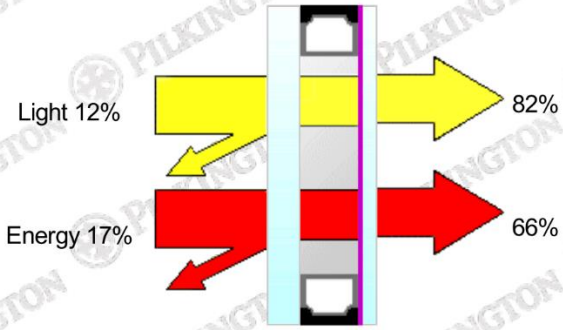
Appendix B – Glazing Specification

PILKINGTON

NSG GROUP



DESCRIPTION

Position	Product	Process	Thickness (nominal) mm	Weight kg/m²
Pilkington **Insulight™** Protect				
Glass 1	Pilkington **Optilam™** Clear	Laminated	6.8	
Cavity 1	Argon (90%)		18.0	
Glass 2	Pilkington **K Glass™** S	Annealed	4.0	
Product Code	6.8L-18Ar-KS4		28.8	25.76

PERFORMANCE

Light		
Transmittance	LT	82%
	UV %	1%
Reflectance Out	LR out	12%
Reflectance In	LR in	12%

Performance Code	
U_g-value/Light/Energy	1.2 / 82 / 66
Ra	97

The values of some of characteristics are displayed as NPD. This stands for No Performance Determined.

Energy		
Direct Transmittance	ET	57%
Reflectance	ER	17%
Absorptance	EA	26%
Total Transmittance	g	66%
Shading Coefficient Total		0.76
Shading Coefficient Shortwave		0.66
Sound Reduction	R_w (C;C_{tr}) dB	35 (-1; -5)
Thermal Transmittance	W/m²K	1.2

Pilkington Spectrum allows you to combine a wide range of products available from Pilkington and determine their key properties such as light transmittance, g value and U value. The program includes restrictions that prevent some combinations being selected that may be considered unwise or impractical. Even with these restrictions, it is still possible to create product combinations that may not be available from your supplier. Please check with your supplier that your chosen product combination is possible, available in the sizes required and in a timescale appropriate to your project. Furthermore, it is essential that you check that your product combination is appropriate for satisfying local, regional, national and other project-specific requirements.

Calculations are made according to EN standards 410 and 673/12898

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