

**Three Houses Lane
Church Wood
Codicote
Hertfordshire**

Planning Noise Assessment

On behalf of



WARNER

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Contents

1.0	Context	1
2.0	Site Description	1
3.0	Policy Context.....	1
	National Planning Policy Framework	2
4.0	Acoustic Standards and Guidance.....	3
	BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.....	3
	British Council for Offices (BCO) Guide to Specification	4
5.0	Assessment Methodology.....	4
	Environmental Noise Survey.....	4
6.0	Noise Assessment.....	6
	Incident sound levels used in assessment	6
	Building fabric assessment.....	6
	Conclusion	7
7.0	Uncertainties.....	7
8.0	Summary	7

Appendices

Appendix A	Acoustic Terminology
Appendix B	Aerial photograph of site
Appendix C	Environmental Sound Survey
Appendix D	Proposed development plans

1.0 Context

- 1.1. It is proposed to convert three agricultural barns to storage use.
- 1.2. Noise Solutions Ltd has been appointed to undertake a noise impact assessment to determine the suitability of the development proposals for storage use.
- 1.3. This report presents the results of the environmental noise survey, the applicable policy/guidance and the noise impact assessment demonstrating the suitability of the site for the development.
- 1.4. To assist with the understanding of this report a brief glossary of acoustic terms can be found in **Appendix A**. A more in-depth glossary of acoustic terms can be assessed at the following web address <http://www.acoustic-glossary.co.uk>

2.0 Site Description

- 2.1. The site at Church Wood in Codicote is currently occupied by three agricultural barns.
- 2.2. The area surrounding the site is predominantly agricultural in nature with some surrounding residential properties.
- 2.3. **Appendix B** contains an aerial photograph showing the site and surrounding area.

3.0 Policy Context

Noise Policy Statement for England

- 3.1. The Noise Policy Statement for England (NPSE¹), published in March 2010, sets out the long-term vision of Government noise policy. The Noise Policy aims, as presented in this document, are:
"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:
 - *avoid significant adverse effects on health and quality of life;*
 - *mitigate and minimise adverse effects on health and quality of life; and*
 - *where possible, contribute to the improvement of health and quality of life."*

¹ Noise Policy Statement for England, Defra, March 2010

- 3.2. The NPSE makes reference to the concepts of NOEL (No Observed Effect Level) and LOAEL (Lowest Observed Adverse Effect Level) as used in toxicology but applied to noise impacts. It also introduces the concept of SOAEL (Significant Observed Adverse Effect Level) which is described as the level above which significant adverse effects on health and quality of life occur.
- 3.3. The first aim of the NPSE is to avoid significant adverse effects, taking into account the guiding principles of sustainable development (as referenced in Section 1.8 of the NPSE). The second aim seeks to provide guidance on the situation that exists when the potential noise impact falls between the LOAEL and the SOAEL, in which case: *"...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development."*
- 3.4. Importantly, the NPSE goes on to state: "This does not mean that such adverse effects cannot occur."
- 3.5. The NPSE does not provide a noise-based measure to define SOAEL, acknowledging that the SOAEL is likely to vary depending on the noise source, the receptor and the time in question. NPSE advises that: *"Not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*
- 3.6. It is therefore likely that other guidance will need to be referenced when applying objective standards for the assessment of noise, particularly in reference to the SOAEL, whilst also taking into account the specific circumstances of a proposed development.

National Planning Policy Framework

- 3.7. A new edition of the NPPF was published in December 2023 and came into effect immediately. The original National Planning Policy Framework (NPPF²) was published in March 2012, with subsequent revisions made periodically - this document replaced the existing Planning Policy Guidance Note 24 (PPG 24) "Planning and Noise." The December 2023 revised edition contains no new directions or guidance with respect to noise. The paragraph references quoted below relate to the December 2023 edition.
- 3.8. Paragraph 180 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst others) *"preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, water or noise pollution or land instability."*

² National Planning Policy Framework, DCLG, March 2012

3.9. The NPPF goes on to state in Paragraph 191:

"planning policies and decisions should ...

- a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development, - and avoid noise giving rise to significant adverse impacts on health and quality of life;*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason ...*

3.10. The NPPF document does not refer to any other documents or British Standards regarding noise other than the Noise Policy Statement for England (NPSE³).

3.11. Paragraph 2 of the NPPF states that *"planning law requires that applications for planning permission must be determined in accordance with the development plan unless material considerations indicate otherwise."*

3.12. Paragraph 12 of the NPPF states that *"The presumption in favour of sustainable development does not change the statutory status of the development plan as the starting point for decision making. Where a planning application conflicts with an up-to-date development plan (including any neighbourhood plans that form part of the development plan), permission should not usually be granted. Local planning authorities may take decisions that depart from an up-to-date development plan, but only if material considerations in a particular case indicate that the plan should not be followed"*.

3.13. Paragraph 123 states that *"Planning policies and decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Strategic policies should set out a clear strategy for accommodating objectively assessed needs, in a way that makes as much use as possible of previously-developed or 'brownfield' land"*.

4.0 Acoustic Standards and Guidance

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

4.1. This Standard provides recommended guideline values for internal noise levels within non-domestic buildings. These guideline noise levels are shown in Table 1, below:

³ Noise Policy Statement for England, DEFRA, March 2010

Table 1 BS 8233 Desirable Internal Ambient Noise Levels for non-domestic buildings

Activity	Location	Design range dB $L_{Aeq,T}$
Speech or telephone communications	Department store Cafeteria, canteen, kitchen	50 – 55
	Concourse Corridor, circulation space	45 – 55
Study and work requiring concentration	Library, gallery, museum	40 – 50
	Staff/meeting room, training room	35 – 45
	Executive office	35 – 40
Listening	Place of worship, counselling, meditation, relaxation	30 – 35

British Council for Offices (BCO) Guide to Specification

- 4.2. The BCO Guide to Specification (2023) includes recommendations for external noise intrusion.

Table 2 BCO Guide Recommended Internal Ambient Noise Levels

Office space	BCO criteria	
	NR L_{Aeq}	L_{AFmax}
Open plan offices	40	55
Speculative offices	38	55
Cellular offices/meeting rooms	35	50

5.0 Assessment Methodology

Environmental Noise Survey

- 5.1. Measurements of the existing background sound levels were undertaken between 11.30 hours on Friday 15th March and 11.45 hours on Monday 18th March 2024. The survey was undertaken in order to establish the typical incident environmental noise levels at the proposed development.
- 5.2. Full details of the survey are provided in [Appendix C](#) alongside time history graphs of the measurement results.
- 5.3. The relevant results of the survey have been summarised in Table 1 and Table 2.

Table 1 Summary of survey results

Measurement period	Range of recorded sound pressure levels (dB)			
	L _{Aeq} (15mins)	L _{Amax} (15mins)	L _{A10} (15mins)	L _{A90} (15mins)
Daytime (07.00 – 23.00 hours)	33-82	42-111	34-77	19-63
Night-time (23.00 – 07.00 hours)	18-69	38-99	18-70	15-42

5.4. The incident environmental noise levels are summarised below.

Table 2 Summary of free field environmental noise levels

Period	Parameter	Sound pressure level, dB
15th March daytime*	L _{Aeq,T}	63.3
15th – 16th March night-time	L _{Aeq,8hours}	40.2
16th March daytime	L _{Aeq, 16 hours}	46.0
16th – 17th March night-time	L _{Aeq,8hours}	38.4
17th March daytime	L _{Aeq, 16 hours}	43.9
17th – 18th March night-time	L _{Aeq,8hours}	54
18th March daytime*	L _{Aeq,T}	71.1
Overall daytime	L_{Aeq, 16 hours}	63
Overall daytime (16th and 17th only)⁺	L_{Aeq, 16 hours}	45
Overall night-time	L_{Aeq, 8 hours}	50

**not complete 16 hour measurements.*

+ Friday 15th and Monday 18th March measurements are affected by onsite construction activity

5.5. Measured octave band sound pressure levels corresponding to the overall values above are given in Table 3.

Table 3 Measured octave band sound pressure levels at the measurement location

Period	Incident sound pressure levels (dB) at Octave Band Centre Frequencies (Hz)								dBA
	63	125	250	500	1000	2000	4000	8000	
Daytime L _{eq, 16 hours}	71	57	57	59	59	55	49	43	63
Daytime L _{eq, 16 hours} (16 th and 17 th only)	58	47	44	42	39	36	34	29	45
Daytime L _{Amax}	67	72	56	52	67	57	66	54	71
Night-time L _{eq, 8 hours}	58	47	49	47	45	42	36	31	50
Night-time L _{Amax}	70	58	57	54	65	55	63	57	68

- 5.6. L_{max} octave band levels relate to the period with the tenth-highest noise event at the survey position, in terms of $L_{AF,max,1-min}$, to ensure that a robust but not overly pessimistic assessment is undertaken.

6.0 Noise Assessment

Incident sound levels used in assessment

- 6.1. The unattended survey was undertaken on the east façade of barn 1. The site is some distance from any external noise source so the unattended measurements are considered to be representative of the incident noise levels affecting the entire site.

Building fabric assessment

- 6.2. In order to assess the suitability of the site for the proposed development it is important to predict the internal noise levels within spaces.
- 6.3. The composite acoustic performance required of any portion of the building envelope will depend on its location relative to the principal noise sources around the site and the nature of the spaces behind it (noise criteria, size, room finishes etc.).
- 6.4. The detailed calculation methodology described in BS 8233:2014 has been used in the assessment.. The calculations are based on the layouts shown on in [Appendix D](#).
- 6.5. The estimated airborne sound insulation performance of each construction element is as set out in Table 6.

Table 6 Proposed building envelope specifications

Item		Attenuation (dB) at Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
Type A Glazing [typically 4mm glass /16mm cavity /4 mm glass]	SRI	21	24	20	25	34	37	40	40
Standard door	SRI	-	32	31	39	43	46	47	-
Roller shutter	SRI	-	7	13	18	21	17	-	-
Ceiling/roof	SRI	-	24	34	40	45	49	-	-
Non-vision wall – all areas Cavity brick-block construction (or cladding with dry-lining with similar acoustic performance)	SRI	35	41	45	45	54	58	55	55

- 6.6. With the external building fabric constructions shown in Table 6 the results of the calculations with the worst-case criteria are given in Table 7.

Table 7 Predicted internal noise levels (based on typical room sizes, windows closed)

Unit	Room Type	Reference	External noise levels,	Predicted internal levels	Criteria dB	Difference, dB
Barn 1	Storage	L _{Aeq} , daytime	45 dB(A)	26 dB(A)	35 dB(A)	-9
		NR daytime	45 dB(A)	NR19	NR35	-16
		L _{Amax} , daytime	71 dB(A)	49 dB(A)	50 dB(A)	-1
Barn 2	Storage	L _{Aeq} , daytime	45 dB(A)	24 dB(A)	35 dB(A)	-11
		NR daytime	45 dB(A)	NR17	NR35	-18
		L _{Amax} , daytime	71 dB(A)	47 dB(A)	50 dB(A)	-3
Barn 3	Storage	L _{Aeq} , daytime	45 dB(A)	20 dB(A)	35 dB(A)	-15
		NR daytime	45 dB(A)	NR13	NR35	-22
		L _{Amax} , daytime	71 dB(A)	43 dB(A)	50 dB(A)	-7

Conclusion

- 6.7. The assessment has demonstrated that, taking into consideration the existing structures adverse effects of noise are minimal.

7.0 Uncertainties

- 7.1. Where possible uncertainty in the above assessments has been minimised by taking the following steps:
- The measurements of the environmental sound levels were taken over a 24-hour period.
 - The meters and calibrators used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.
 - Uncertainty in the calculated impacts has been reduced by the use of well-established calculation methods.

8.0 Summary

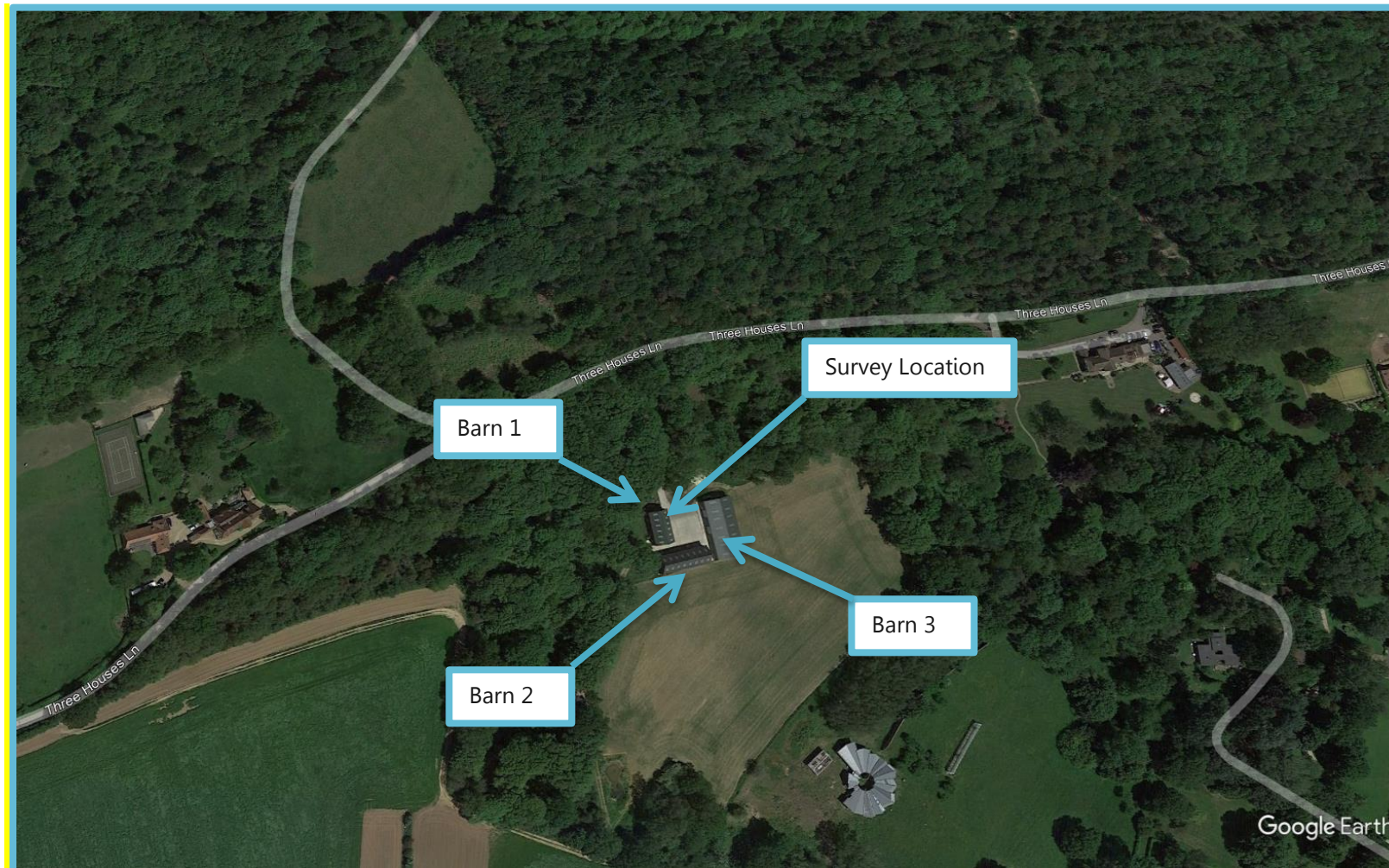
- 8.1. It is proposed to convert three agricultural barns to storage use.
- 8.2. An environmental noise survey at the proposed site was undertaken in order to establish the typical highest incident noise levels at the proposed development.

- 8.3. The assessment has demonstrated that the proposals will not result in excessive sound levels and would be suitable for the proposed use.
- 8.4. Therefore, the assessment has demonstrated that incident ambient noise levels around the proposed development should not be viewed as a constraint for the planning application.

Appendix A Acoustic Terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq,T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq,T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max,T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10,T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10,18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10,1h}$ values from 06:00-24:00.
$L_{90,T}$	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.

Appendix B Aerial photograph of site



Appendix C Environmental Sound Survey

Details of unmanned environmental sound survey

- C.1 Measurements of the existing background sound levels were undertaken between 11.30 hours on Friday 15th March and 11.45 hours on Monday 18th March 2024.
- C.2 The sound level meters were programmed to record the A-weighted L_{eq} , L_{90} , L_{10} and L_{max} noise indices for consecutive 15-minute sample periods for the duration of the survey.

Measurement position

- C.3 The sound level meter was located outside the window of Barn 1, as indicated in [Appendix B](#).
- C.4 In accordance with BS 7445-2:1991 'Description and measurement of environmental noise - Part 2: Guide to the acquisition of data pertinent to land use', the measurements were undertaken under free-field conditions.

Equipment

- C.5 Details of the equipment used during the survey is provided in the table below. The sound level meters were calibrated before and after the survey; no significant change in the calibration level was noted.

Description	Model / serial no.	Calibration date	Calibration certificate no.
Class 1 Sound level meter	Svantek 977/ 97446	16/01/2023	1504305-1
Condenser microphone	Microtech MK255 / 20194		
Preamplifier	Svantek SV12L / 106487		
Calibrator	Svantek SV 30A / 10847	01/06/2023	1505421-1

Weather Conditions

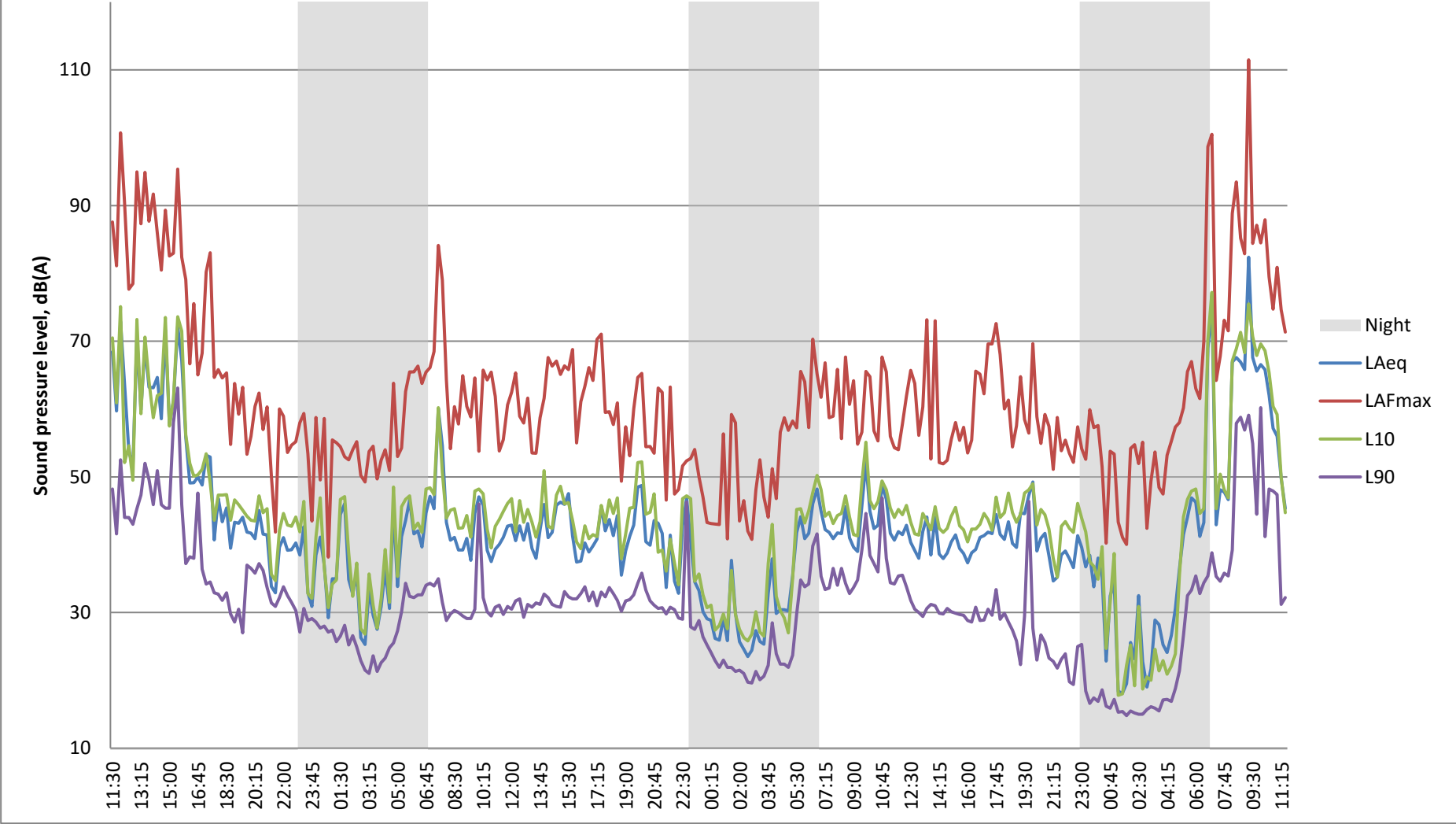
- C.6 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for the environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.

Weather Conditions				
Measurement Location	Date/Time	Description	Beginning of Survey	End of Survey
As indicated on Appendix B	11.30 15/3/24 - 11.45 18/3/24	Temperature (°C)	10	13
Cloud Cover Symbol Scale in oktas (eighths) 0 Sky completely clear 1 2 3 4 Sky half cloudy 5 6 7 8 Sky completely cloudy (9) Sky obstructed from view		Precipitation:	Yes	No
		Cloud cover (oktas - see guide)	5	6
		Presence of fog/snow/ice	No	No
		Presence of damp roads/wet ground	Yes	Yes
		Wind Speed (m/s)	2	2
		Wind Direction	South westerly	Southerly
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No

Results

- C.7 The results of the survey are representative of the typical incident noise levels at the proposed residential blocks. The noise levels around the development were observed to be predominantly due construction activity. The results of the survey are presented in time history graphs overleaf.

Three Houses Lane Friday 15 - Monday 18 Mar 2024



Appendix D

Proposed development plans

