Mixed-Use Development at Cropper Road, Blackpool, Lancashire:

Noise Assessment

Breck Homes Ltd / Eden Land and Developments Limited

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EXECUTIVE SUMMARY

The results of a noise measurement survey and desk-based assessment are presented, with respect to the proposed mixed use commercial and residential development of land at Cropper Road, Blackpool, Lancashire.

The assessment shows that the site is not adversely affected by noise and concludes that it can be suitably developed for mixed commercial and residential use, and that noise need not be a reason for refusal of planning permission

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1 INTRODUCTION AND SITE DESCRIPTION

1.1 Echo Acoustics was commissioned by Breck Homes Ltd / Eden Land and Development Ltd to undertake an assessment of noise affecting the proposed development of land at Cropper Road, Blackpool, Lancashire.

1.2 The proposals comprise mixed-use commercial and residential development on land currently occupied by a garden centre and associated small businesses. The area is a mixture of agricultural land, housing and small businesses. Cropper Road, defining the site's eastern boundary, is a poorly-maintained local access road providing access to the new housing development on the opposite side of Cropper Road and a few small-scale commercial operations.

1.3 School Road, a local access road, and the B5410 Annes way, which provides access from the southern side of Blackpool to the M55, both lie a short distance to the south/south-east of the site.

1.4 The M55 motorway lies approximately 1 km to the north and the site also sits under the circuit for aircraft operating out of Blackpool Airport, located approximately 2km to the south-west.

1.5 The site location and its immediate surroundings are presented in Figure 1.

Figure 1: Site location and surroundings

1.6 The ambient noise at the site is generally dominated by traffic noise from School Road and Annes Way, with lesser occasional contributions from vehicle movements on Cropper Road, local domestic and commercial noise, including materials handling at the garden centre and customer vehicles moving in the car park, and occasional overflights of aircraft.

1.7 The proposals for the development, comprising a mixture of residential properties and local commercial uses e.g. office/storage, retail/local foodstore etc, are presented in Figure 2.

Figure 2: Proposed site layout (Drawing P01 Cropper Road - Proposed Site Layout - Rev A)

1.8 This report presents the results of a noise measurement survey, desk-based assessment of noise affecting the site and its significance with respect to the proposed residential uses and, where appropriate, a discussion of suitable noise mitigation requirements for the site.

1.9 A glossary of acoustic terminology is presented at Appendix A.

2 GUIDANCE

Noise – national and local policy guidance

2.1 Planning policies are set at both a national and local level. With respect to national policy, assessment of the suitability of a site for residential development is guided by the National Planning Policy Framework (NPPF), issued in March 2012 and amended in 2018, 2019 and 2021.

2.2 With regard to noise, the NPPF ("the Framework") does not provide specific noise policies or defined noise limits, but rather is intended to enable the planning system to support the Government's aims and objectives with respect to sustainable development, and provides "*a framework within which locally-prepared plans for housing and other development can be produced*" and "*requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise*".

2.3 None of the current local or national planning policies preclude residential development of the site on the grounds of noise.

2.4 Additional national planning guidance is provided in the Government's Noise Policy Statement for England (NPSE – "the Noise Policy"), to which the Framework makes specific reference as the main source of national guidance specifically on planning and noise.

2.5 The Noise Policy has a long term vision to "*Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development*". The vision is supported by three key aims intended to promote sustainable development with respect to noise so that "*Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

2.6 • *avoid significant adverse impacts on health and quality of life;*

2.7 • *mitigate and minimise adverse impacts on health and quality of life; and*

2.8 • *where possible, contribute to the improvement of health and quality of life*".

2.9 Health is defined by the World Health Organisation as "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity, and recognises the enjoyment of the highest attainable standard of health as one of the fundamental rights of every human being*" and the Noise Policy makes "*a distinction between 'quality of life' which is a subjective measure that refers to people's emotional, social and physical well being and 'health' which refers to physical and mental well being*".

2.10 However, the Noise Policy recognises that it is not currently possible to define a single objective noise level having specific effects on people, hence the emphasis on "*promoting*" improvements to health and quality of life through effective management of noise, considered in the context of the wider environment and factors other than noise.

2.11 Additional guidance is given in the Planning Practice Guidance Note (PPG) on noise, issued in March 2014, alongside the NPPF and updated in 2018 and July 2019. This "advises on how planning can manage potential noise impacts in new development". The PPG suggests the following noise exposure hierarchy, based on average responses to noise:

Table 1: PPG noise exposure and response hierarchy

Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level (NOEL)			
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non- auditory	Unacceptable Adverse Effect	Prevent

2.10 Beyond this, however, the guidance is relatively generic. It avoids specifying 'acceptable' environmental noise levels as the acceptability of a source of is both subjective and context-dependant.

Noise – technical guidance

2.11 In May 2017, a Working Group consisting of representatives of the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH) produced a Professional Practice Guidance (Pro-PG) document[1]. The guidance was produced "*to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England*" and "*which encourages better acoustic design for new residential development and aims to protect people from the harmful effects of noise*". Its primary aim is "*to assist the delivery of sustainable development by promoting good health and wellbeing through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise*".

2.12 The guidance identifies that "*Good acoustic design is about more than the numbers. It is a holistic design process that creates places that are both comfortable and attractive to live in, where acoustics is considered integral to the living environment.*

Good acoustic design can involve, for example, careful site layouts and better orientation of rooms within dwellings. Good acoustic design does not mean "gold plating" or significantly increasing costs. This guidance seeks to encourage and promote design outcomes that are proportionate and reasonable in the particular circumstances of each development site".

2.13 It should be noted that the Pro-PG *"does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate*".

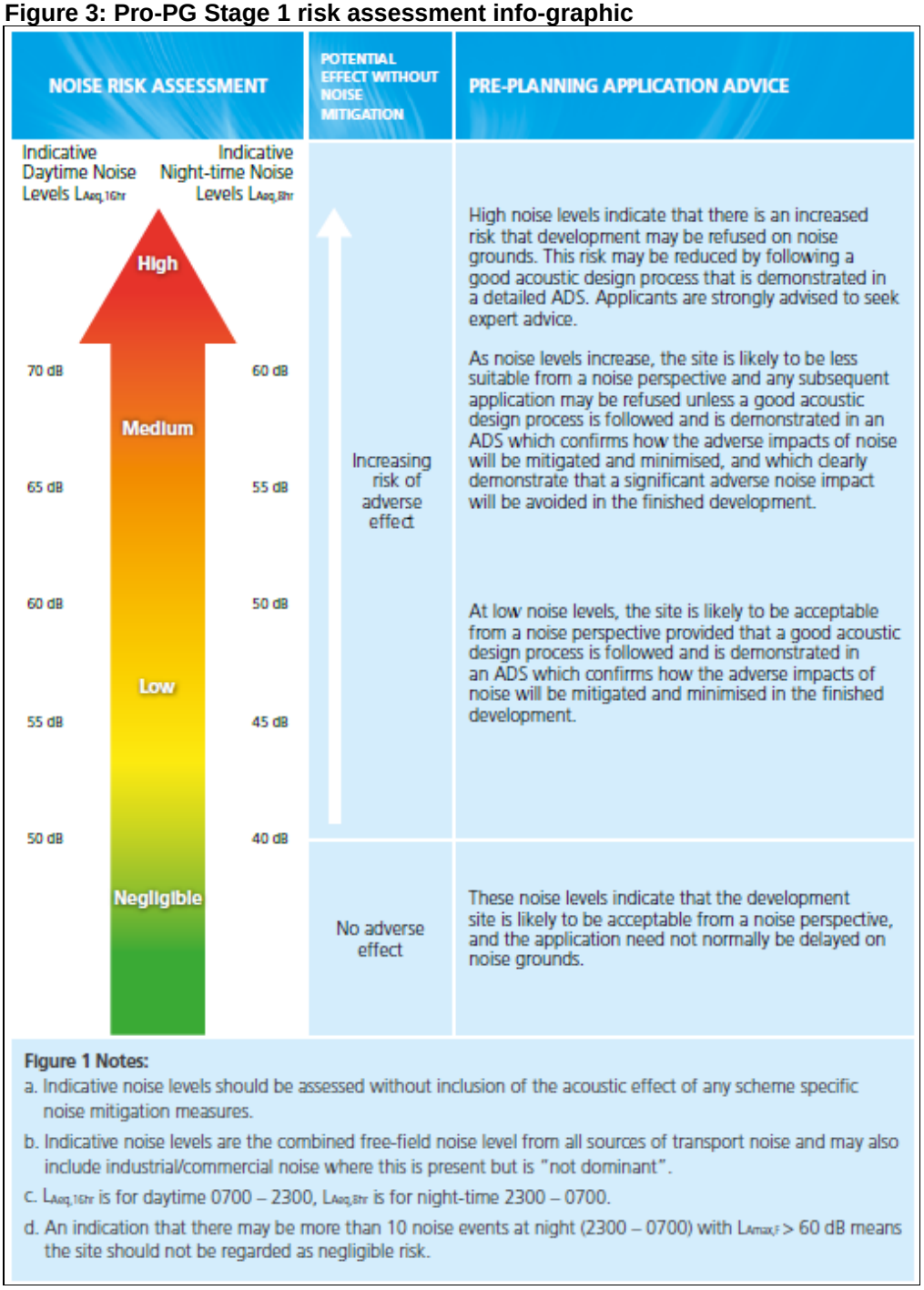
2.14 The guidance "*advocates a systematic, proportionate, risk based, 2-stage, approach. The approach encourages early consideration of noise issues, facilitates straightforward accelerated decision making for lower risk sites, and assists proper consideration of noise issues where the acoustic environment is challenging*". The two sequential stages are:

- Stage 1 – an initial noise risk assessment of the proposed development site; and
- Stage 2 – a systematic consideration of four key elements.

2.15 Figure 1 of the guidance provides a useful graphical overview of the Stage 1 risk assessment considerations, reproduced as Figure 4.

[1] ANC, IOA & CIEH (2017) *Pro-PG: Planning & Noise Professional Practice Guidance on Planning & Noise: New Residential Development*

Figure 3: Pro-PG Stage 1 risk assessment info-graphic



2.16 The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

- Element 1 – demonstrating a "Good Acoustic Design Process";
- Element 2 – observing internal "Noise Level Guidelines";
- Element 3 – undertaking an "External Amenity Area Noise Assessment"; and
- Element 4 – consideration of "Other Relevant Issues".

2.17 "*The approach is underpinned by the preparation and delivery of an "Acoustic Design Statement" (ADS). An ADS for a site assessed as high risk should be more detailed than for*

a site assessed as low risk. An ADS should not be necessary for a site assessed as negligible risk".

2.18 With respect to noise affecting residential amenity, BS 8233: 2014 *Guidance on sound insulation and noise reduction for buildings* gives recommendations for external and internal noise levels for residential dwellings in order to protect residential amenity, based on health-based research, as follows:

- Living rooms during the day 35 dB $L_{Aeq,16hour}$
- Dining rooms during the day 40 dB $L_{Aeq,16hour}$
- Bedrooms during the day 35 dB $L_{Aeq,16hour}$
- Bedrooms during the night 30 dB $L_{Aeq,8hour}$

2.19 These values can be taken to be broadly equivalent with the LOAEL in the PPG. Note that these are not specific criteria or 'target' noise levels, merely indicative recommendations which will be context-dependant. However, most Local Authorities tend to apply the recommended noise levels as strict criteria.

2.20 In most standard modern properties, the walls and roof provide relatively high levels of sound insulation of greater than 40 dB; the weakest part of a building facade, with respect to noise, is generally the windows. Modern construction methods for new residential properties incorporate standard thermal double-glazing which, the standard suggests, will provide approximately 30 dB R_w of sound attenuation when closed. The standard does not specifically give sound attenuation values for partially open windows, although the worked example (G.1) at Annex G of the Standard indicates that a partially open window would provide 15 dB of sound attenuation.

2.21 With respect to noise affecting external areas i.e. gardens, BS 8233:2014 states that "*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.*".

2.22 With regard to maximum (L_{AFmax}) internal noise levels at night, BS 8233 (Note 4) states the following:

"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 LAmax,F, depending on the character and number of events per night. Sporadic noise events could require separate values".

2.23 A study of aircraft noise, undertaken by Vallet & Vernet[2], suggests that, for good sleep, indoor sound pressure levels in bedrooms should not exceed approximately 45 dB L_{Amax} more than 10-15 times per night. The findings of this research are conventionally accepted as being suitable for use in the assessment of other forms of noise.

[2] Vallet M. & Vernet I. (1991) *Night noise index for aircraft noise and sleep disturbance*. Proceedings Internoise 1991, Sydney, Vol. 1 pp 207-210

3 METHODOLOGY

3.1 The assessment included a noise measurement survey between 2.45pm on Wednesday 30 June and 12.45pm on Thursday 1 July 2021. The measurements comprised continuous, consecutive noise data samples of 1-second and 15-minutes duration.

3.2 The measurements were made at a single location within the site as presented in Figures 4 and 5 .

Figure 4: Noise measurement location

Figure 5: Meter in position

3.3 The survey was undertaken using a Class 1 (IEC 61672) *Casella CEL633C* sound level meter, placed in a locked weatherproof box and with the microphone mounted on a tripod at a height of 1.4 metres above the ground. The microphone was protected by a proprietary wind-shield and was field-calibrated before and after the survey; no significant variation in calibration tone was observed.

3.4 The weather during the survey was hot and dry with negligible to light south-westerly winds.

3.5 The assessment of noise effects on future residential occupants was undertaken with reference to the guidance provided in the Pro-PG and BS 8233.

4 RESULTS, ASSESSMENT AND DISCUSSION

Site boundary measurement data and observations

4.1 The 15-minute data were consolidated into day time (07:00 – 23:00) and night time (23:00 – 07:00) periods. The data are summarised in Table 2 with the full 15-minute data set presented in Table 4 at Appendix B.

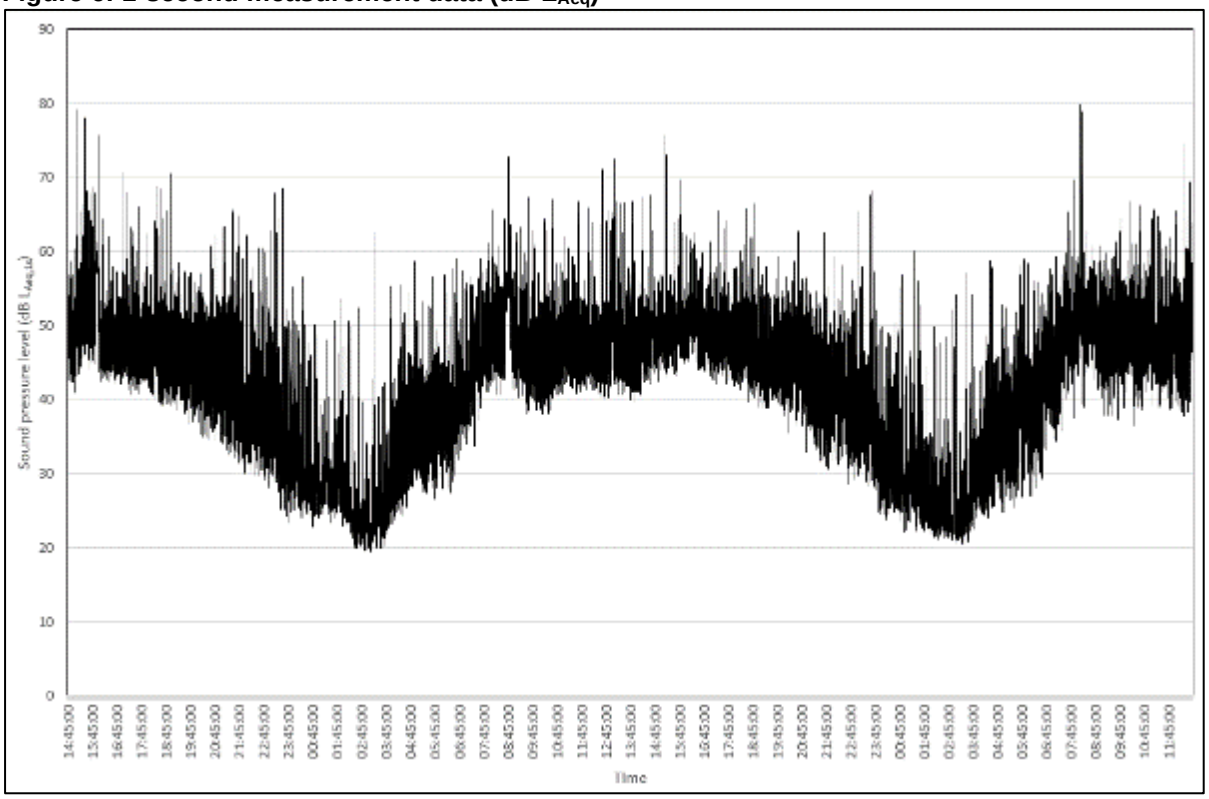
4.2 The 1-second data were used to provide detailed post-measurement analysis, where necessary; the data are too numerous to present in this report in tabulated form but are available on request and are presented graphically in Figure 6.

Table 2: Summarised noise measurement data

Period		Measured noise (dB)		
		L_{A90}*	L_{Aeq}	L_{Amax}
Day	14:32 - 23:00	44.5	51.1	-
Night	23:00 - 07:00	25.5	39.2	73.5
Day	07:00 - 23:00	45.5	50.3	-
Night	23:00 - 07:00	31.5	40.2	73.2
Day	07:00 - 12:45	43.5	51.8	-

** Modal value i.e. most frequently occurring*

Figure 6: 1-second measurement data (dB L_{Aeq})

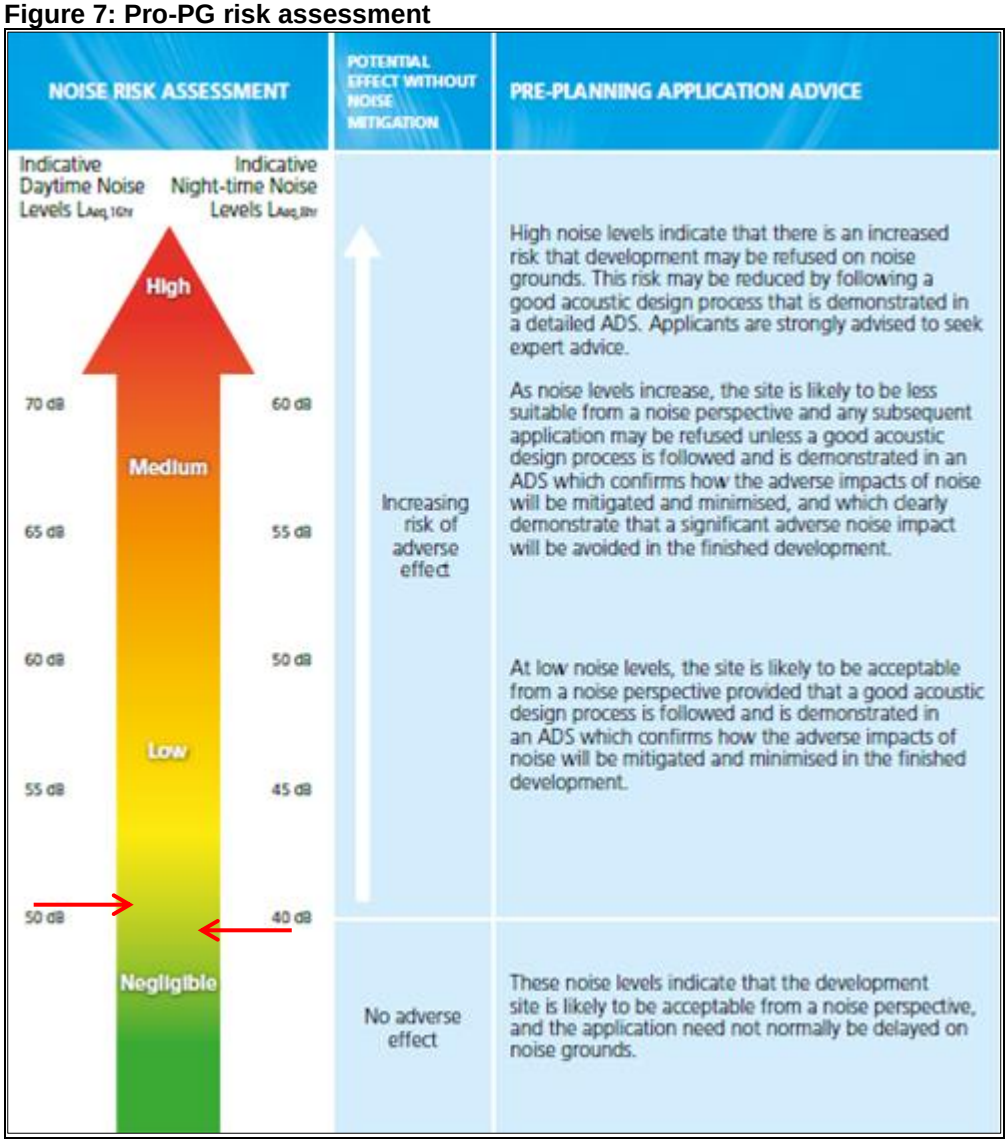


4.3 Qualitatively, the site is not particularly noisy with traffic on the surrounding roads and occasional aircraft movements creating moderate amounts of noise.

Pro-PG risk assessment

4.4 With respect to the Pro-PG Stage 1 risk assessment, the site was deemed to be a "negligible" to "low" risk site (Figure 7); this report is provided as the Acoustic Design Statement (ADS) for the development.

Figure 7: Pro-PG risk assessment



BS8233 external noise assessment:

4.5 The data in Table 2 indicate that day time external noise levels are at, or just above, the lower 51 dB $L_{Aeq,\ 16h}$ guideline noise level suggested in BS 8233.

4.6 **No mitigation will be required** with respect to protection of external amenity areas.

BS8233 internal noise assessment and mitigation

4.7 The measurement data from Table 2 were used to calculate internal noise levels in habitable rooms. The calculation assumed 15 dB and 30 dB R_W of sound attenuation through an open and closed window, respectively.

4.8 The results of this are presented in Table 3.

Table 3: Internal noise levels

Period		Calculated noise (dB)	
		L_{Aeq}	L_{Amax}
Windows closed			
Day	14:32 - 23:00	21.1	-
Night	23:00 - 07:00	9.2	43.5
Day	07:00 - 23:00	20.3	-
Night	23:00 - 07:00	10.2	43.2
Day	07:00 - 12:45	21.8	-
Windows open			
Day	14:32 - 23:00	36.1	-
Night	23:00 - 07:00	24.2	58.5
Day	07:00 - 23:00	35.3	-
Night	23:00 - 07:00	25.2	58.2
Day	07:00 - 12:45	36.8	-

4.9 The data in Table 3 show that, with windows both open and closed, internal ambient (L_{Aeq}) noise levels are suitable for the protection of residential amenity in all habitable rooms. This assumes the use of standard thermal double-glazed units.

4.10 The data suggest that, with windows open, the 45 dB L_{Amax} guideline value for bedrooms at night may be exceeded. Figures 8 and 9 present the night time 1-second measurement data for the 2 nights, with a line marking the external 60 dB L_{Amax} level; this level would be commensurate with a 45 dB L_{Amax} level inside the bedrooms, assuming 15 dB of attenuation through an open window.

4.11 The charts show that the 60 dB L_{Amax} level is not exceeded "*more than 10 to 15 times per night*".

Figure 8: Night time maximum (dB L_{Amax}) noise level data – 1st night

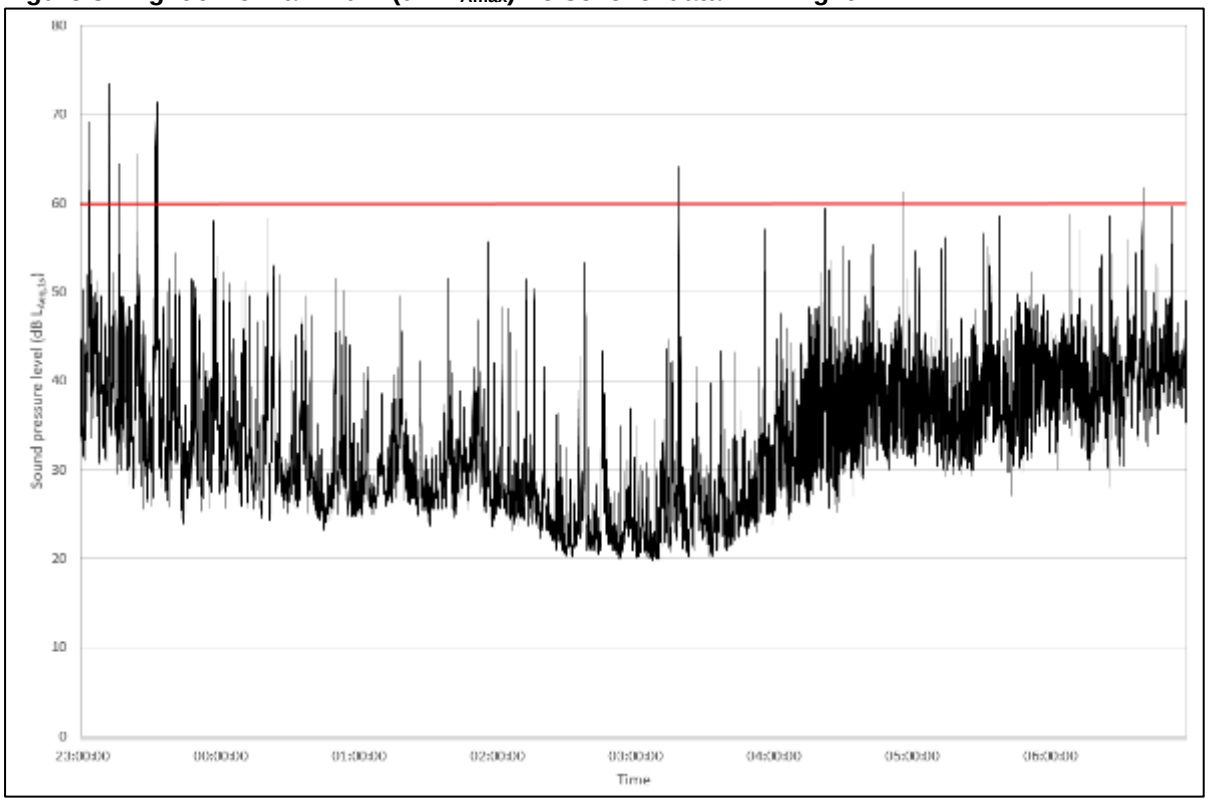
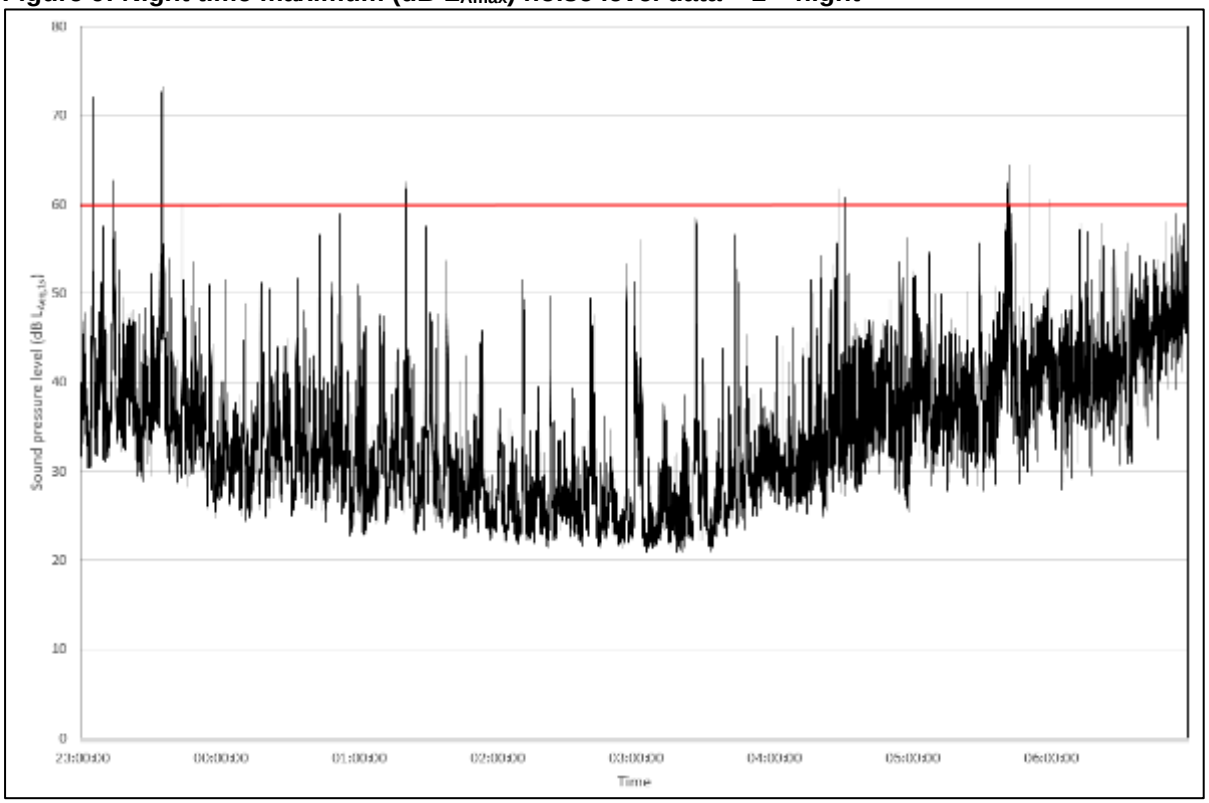


Figure 9: Night time maximum (dB L_{Amax}) noise level data – 2nd night



4.12 The data show that suitable internal noise levels can be achieved in all habitable rooms; **no specific noise mitigation measures will be required**.

Noise from commercial uses

4.13 At this stage of the development it is not possible to predict the noise that might arise from the commercial uses on the site.

4.14 The commercial uses would operate during the day time and evening and, in terms of noise generation, would most likely be similar to the existing commercial activities on the site; from experience, these kinds of commercial uses give rise to very little adverse noise.

4.15 Potential sources of noise that might give rise to disturbance, in this setting, would be associated with the operation of fixed plant equipment, installed on the outside of the commercial buildings, running during the night time.

4.16 The data in Table 2 provide 'modal' night time background (dB L_{A90}) noise levels which can be used, through a suitably-worded planning condition, to control noise from any future plant equipment installed on the site by setting 'permissible' operational noise limits for the equipment, as measured at the nearest houses.

5 SUMMARY & CONCLUSION

5.1 The assessment has shown that the site is not particularly noisy and that, without a requirement for any specific noise mitigation measures, the guideline noise levels recommended in BS 8233: 2014 *Guidance on sound insulation and noise reduction for buildings* can be achieved in all properties.

5.2 Potential noise arising from the operation of fixed plant equipment cannot be predicted at this stage but the measured background (dB L_{A90}) data in Table 2 of this report can be used to set 'permissible' operational limits from the equipment, through a suitably-worded planning condition.

5.3 The assessment concludes that the site is not adversely affected by noise, can be suitably developed for mixed commercial and residential use, and that noise need not be a reason for refusal of planning permission.

6 APPENDICES

Appendix A: Glossary of acoustic terms

Ambient noise: the noise from all sources, both near and far, at any given time. Conventionally defined using the A-weighted equivalent continuous noise level (L_{Aeq}) [see below].

Background noise level (dB L_{A90}):In the UK, the 90th percentile noise level (L_{A90}) is generally used to define 'background' noise. This is a statistical parameter describing the noise level that is exceeded for 90% of the measurement or assessment time. Its value lies in the fact that it is a statistical value, towards the lower end of a measured range of data, and which is relatively 'stable' i.e. not adversely affected by occasional high-energy noise events.

Decibel (dB): a unit of level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 micro-Pascals (µPa), 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) / A-weighting: 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 (in steady noise) 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 level 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).

$L_{Aeq,T}$*:* the equivalent continuous sound level - the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). L_{Aeq} is used to describe many types of noise and can be measured directly with an integrating sound level meter.

L_{Amax}*:* the maximum single-event noise level attained during a measurement period.

Noise: any audible sound. Often defined as unwanted sound. Can be damaging to hearing if it is too loud or can be just annoying if it interferes with the normal enjoyment of others.

Sound / *sound pressure:* a fluctuation in air pressure over the static ambient pressure.

Sound pressure level: the sound pressure relative to a standard reference pressure of 20 µPa (20 x 10^{-6}) on the decibel scale.

Appendix B: Measurement data

Table 4: 15-minute noise measurement data

Time	Measured noise (dB)		
	L_{AF90}	L_{Aeq}	L_{AFmax}
14:45:00	44.5	48.9	63.8
15:00:00	44.5	58.1	83.5
15:15:00	47.0	59.1	81.7
15:30:00	48.0	54.9	74.8
15:45:00	47.5	56.7	70.6
16:00:00	45.0	55.0	77.0
16:15:00	44.5	48.7	62.8
16:30:00	44.0	47.8	59.7
16:45:00	44.0	50.4	75.9
17:00:00	44.0	49.9	70.3
17:15:00	43.0	48.9	69.3
17:30:00	43.5	48.8	69.5
17:45:00	43.5	47.4	64.8
18:00:00	43.0	48.2	64.4
18:15:00	42.5	53.3	70.7
18:30:00	41.0	48.7	70.3
18:45:00	41.5	51.2	72.4
19:00:00	41.0	45.7	59.6
19:15:00	41.5	47.3	59.5
19:30:00	40.0	45.5	58.4
19:45:00	40.5	46.0	60.5
20:00:00	40.0	46.0	59.8
20:15:00	41.0	45.8	56.9
20:30:00	38.5	45.5	63.6
20:45:00	39.5	45.7	65.3
21:00:00	36.5	47.8	65.4
21:15:00	36.0	45.4	69.2
21:30:00	34.5	46.5	66.8
21:45:00	34.0	44.8	65.7
22:00:00	33.0	42.0	64.3
22:15:00	32.5	43.2	59.7
22:30:00	32.5	45.1	67.7
22:45:00	31.5	43.0	61.6
23:00:00	32.5	44.6	73.5
23:15:00	29.0	45.5	65.5
23:30:00	27.5	45.9	71.3
23:45:00	27.5	39.9	58.0
00:00:00	27.5	37.5	52.3
00:15:00	26.0	39.3	58.2
00:30:00	25.5	34.0	49.5
00:45:00	24.5	34.8	51.5

Time	Measured noise (dB)		
	L_{AF90}	L_{Aeq}	L_{AFmax}
01:00:00	25.5	28.6	41.6
01:15:00	26.0	33.0	49.5
01:30:00	25.0	30.8	51.5
01:45:00	25.5	34.6	55.7
02:00:00	24.0	33.3	51.4
02:15:00	21.5	30.5	50.4
02:30:00	20.5	31.1	53.3
02:45:00	20.5	25.5	43.3
03:00:00	20.0	26.2	44.6
03:15:00	21.0	37.7	64.1
03:30:00	20.5	27.2	43.3
03:45:00	23.5	34.5	57.1
04:00:00	25.5	33.0	47.6
04:15:00	28.0	38.1	59.4
04:30:00	29.0	39.1	55.3
04:45:00	31.0	39.3	61.3
05:00:00	30.5	38.1	54.8
05:15:00	29.5	35.7	56.1
05:30:00	30.5	39.9	58.6
05:45:00	32.5	40.6	52.2
06:00:00	33.5	41.0	58.7
06:15:00	31.5	40.6	58.6
06:30:00	34.0	42.5	61.7
06:45:00	37.0	42.1	59.6
07:00:00	39.5	46.6	61.6
07:15:00	42.5	49.0	60.2
07:30:00	46.0	51.8	72.1
07:45:00	45.0	50.6	75.7
08:00:00	47.0	60.5	86.0
08:15:00	46.5	51.7	64.6
08:30:00	48.0	52.2	63.3
08:45:00	45.5	49.8	64.0
09:00:00	43.5	49.5	61.2
09:15:00	43.0	48.7	63.1
09:30:00	43.5	50.5	62.4
09:45:00	43.5	50.2	68.3
10:00:00	45.5	50.1	75.4
10:15:00	43.5	49.9	62.5
10:30:00	42.0	49.6	69.4
10:45:00	44.5	49.3	62.6
11:00:00	44.5	49.7	67.6
11:15:00	42.0	49.1	68.3
11:30:00	43.0	49.2	61.6

Time	Measured noise (dB)		
	L_{AF90}	L_{Aeq}	L_{AFmax}
11:45:00	41.5	48.3	64.8
12:00:00	42.0	51.4	70.5
12:15:00	41.5	51.8	76.8
12:30:00	42.5	53.4	71.7
14:32:37	45.5	52.4	69.1
14:45:00	45.5	49.1	58.6
15:00:00	45.5	54.3	77.3
15:15:00	45.5	49.3	64.1
15:30:00	45.5	50.7	67.3
15:45:00	46.5	50.8	74.9
16:00:00	47.0	52.2	66.3
16:15:00	48.0	52.9	69.7
16:30:00	46.0	49.9	63.5
16:45:00	46.5	49.3	64.2
17:00:00	44.5	48.5	65.5
17:15:00	45.5	49.5	69.3
17:30:00	45.0	51.2	67.1
17:45:00	44.5	48.4	64.4
18:00:00	43.5	47.6	60.9
18:15:00	44.5	48.9	68.0
18:30:00	42.5	50.0	70.7
18:45:00	43.0	48.9	68.7
19:00:00	41.5	46.4	59.0
19:15:00	41.5	45.5	60.5
19:30:00	41.5	45.8	57.9
19:45:00	42.0	46.5	61.6
20:00:00	41.5	46.7	58.0
20:15:00	42.5	47.6	60.6
20:30:00	41.0	47.7	64.1
20:45:00	39.0	46.0	58.8
21:00:00	37.5	44.4	57.1
21:15:00	36.5	43.4	58.5
21:30:00	34.5	44.0	65.5
21:45:00	34.5	42.1	57.4
22:00:00	35.5	43.9	66.3
22:15:00	35.0	42.8	59.9
22:30:00	32.5	41.1	53.9
22:45:00	33.0	42.0	58.1
23:00:00	32.0	44.8	72.1
23:15:00	31.5	39.3	56.9
23:30:00	31.5	46.3	73.2
23:45:00	27.0	37.3	53.5
00:00:00	26.0	33.2	51.5

Time	Measured noise (dB)		
	L_{AF90}	L_{Aeq}	L_{AFmax}
00:15:00	27.0	35.3	51.2
00:30:00	26.5	37.1	56.6
00:45:00	24.5	38.0	58.9
01:00:00	24.5	33.5	51.0
01:15:00	24.5	42.8	62.6
01:30:00	24.0	36.9	53.7
01:45:00	23.0	29.9	45.8
02:00:00	22.5	32.8	51.5
02:15:00	22.5	30.1	49.7
02:30:00	22.0	31.8	49.4
02:45:00	22.0	31.4	53.3
03:00:00	21.5	33.7	56.0
03:15:00	22.0	35.3	58.5
03:30:00	21.5	32.8	56.6
03:45:00	26.0	32.3	51.2
04:00:00	26.0	31.3	46.2
04:15:00	27.0	38.7	61.7
04:30:00	28.5	39.0	60.8
04:45:00	28.5	37.8	56.2
05:00:00	30.5	39.1	54.7
05:15:00	30.0	38.4	55.6
05:30:00	31.5	44.5	64.4
05:45:00	32.5	41.1	64.5
06:00:00	33.0	41.9	60.6
06:15:00	34.0	41.7	57.9
06:30:00	33.5	44.0	55.7
06:45:00	42.0	47.4	58.9
07:00:00	39.5	46.6	61.6
07:15:00	42.5	49.0	60.2
07:30:00	46.0	51.8	72.1
07:45:00	45.0	50.6	75.7
08:00:00	47.0	60.5	86.0
08:15:00	46.5	51.7	64.6
08:30:00	48.0	52.2	63.3
08:45:00	45.5	49.8	64.0
09:00:00	43.5	49.5	61.2
09:15:00	43.0	48.7	63.1
09:30:00	43.5	50.5	62.4
09:45:00	43.5	50.2	68.3
10:00:00	45.5	50.1	75.4
10:15:00	43.5	49.9	62.5
10:30:00	42.0	49.6	69.4
10:45:00	44.5	49.3	62.6

Time	Measured noise (dB)		
	L_{AF90}	L_{Aeq}	L_{AFmax}
11:00:00	44.5	49.7	67.6
11:15:00	42.0	49.1	68.3
11:30:00	43.0	49.2	61.6
11:45:00	41.5	48.3	64.8
12:00:00	42.0	51.4	70.5
12:15:00	41.5	51.8	76.8
12:30:00	42.5	53.4	71.7