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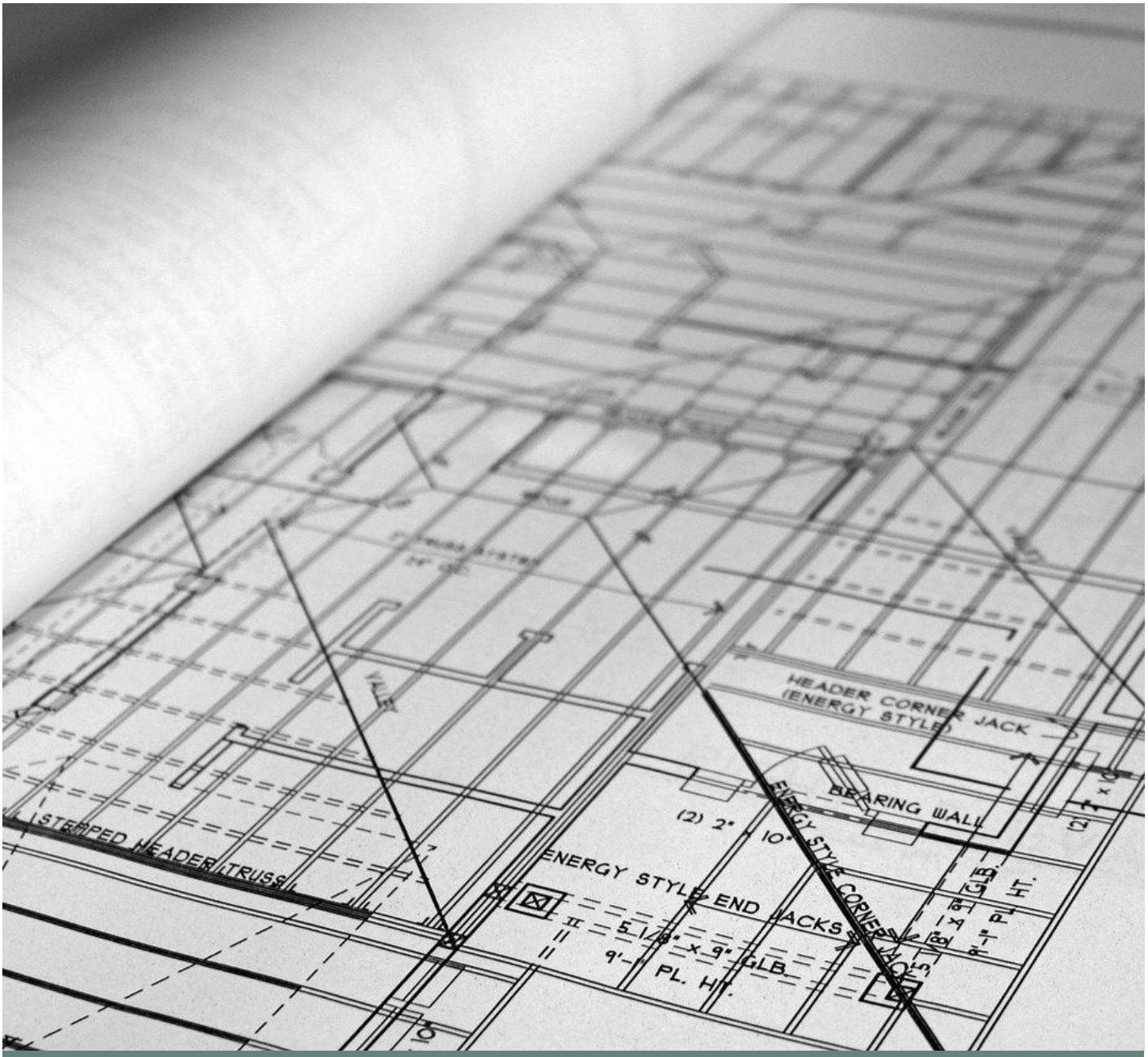

Froghall Road, Cheadle

Noise Impact Assessment Report

Client: Bloor Homes North West

Project Number: 0512021

Date: 16th July 2021

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1 INTRODUCTION

1.1 OVERVIEW

1.1.1 JPM Acoustics Ltd has been appointed by Bloor Homes North West to undertake a noise impact assessment to support a planning application for a proposed residential development on land off Froghall Road in Cheadle, Staffordshire.

1.1.2 This noise impact assessment considers the impact of the existing noise environment on the proposed noise sensitive development.

1.1.3 The assessment has been undertaken with due consideration to relevant British Standards, Planning Policy and guidance documents relating to noise, and draws on the results of a baseline noise survey undertaken in June 2021.

1.1.4 This report is necessarily technical in nature. Therefore, to assist the reader, a glossary of acoustic terminology is provided in Appendix A.

1.2 SITE DESCRIPTION

1.2.1 The proposed development site is located to the east of Froghall Road in Cheadle, Staffordshire. The site is bounded by Froghall Road and existing residential dwellings to the west, residential dwellings on Hammersley Hays Road and public open space to the south, Broad Haye Farm and open fields to the east, and open fields to the north. Figure 1-1 shows the site location.

Figure 1-1: Indicative Redline Site Boundary

1.3 PROPOSED DEVELOPMENT

1.3.1 The proposed residential development comprises circa 250 dwellings spread over three development parcels. Figure 1-2 shows the proposed residential development parcels.

Figure 1-2: Proposed Development

2 LEGISLATION AND GUIDANCE

2.1 PROFESSIONAL PRACTICE GUIDANCE ON PLANNING & NOISE – NEW RESIDENTIAL DEVELOPMENT (PROPG)

2.1.1 The ProPG document was published in May 2017 and is intended to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England. The guidance only relates to new residential development affected by transportation noise sources such as road, rail and air traffic.

2.1.2 The document was jointly authored, published and supported by the Association of Noise Consultants (ANC), the Institute of Acoustics (IoA) and the Chartered Institute of Environmental Health (CIEH). It is recognised in the document that whilst current Government planning and noise policy and guidance sets clear objectives it does not prescribe specific numerical acoustics standards.

2.1.3 The ProPG is spread over three documents. The main document and two supplementary documents. The main document presents planning guidance, the first supplementary document details a summary of extant and superseded noise related planning policy and guidance, and the second supplementary document describes what is meant by Good Acoustic Design.

2.1.4 The main document recommends a two-stage approach to assessment. The first stage of the assessment comprises an Initial Site Risk Assessment which looks at external noise levels on the site and gives a broad indication of the risk of an adverse effect on future residents. Where noise levels are above the point at which 'no adverse effect' is indicated, the assessment moves on to the second stage. Where noise levels on the site are below this level, it is advised that the 'application need not normally be delayed on noise grounds'.

2.1.5 At the second stage, a full assessment is undertaken, which has four elements:

- Good Acoustic Design Process;
- Internal Noise Level Guidelines;
- External Amenity Area Noise Assessment; and
- Assessment of Other Relevant Issues.

2.1.6 The results of the assessment will inform the recommendation from the environmental health officer to the decision maker, the planning officer. The recommendation will be one of the following:

- Grant without noise conditions;
- Grant with noise conditions;
- Avoid (where significant adverse effects are indicated); or
- Prevent (where unacceptable adverse effects are indicated).

2.1.7 The first two options representing 'no objection on noise grounds' and the last two being 'an objection on noise grounds'.

2.1.8 This assessment has followed the general approach in the document by undertaking the Initial Site Risk Assessment and considering internal and external noise level criteria, as required by the second stage of the assessment approach from the ProPG.

2.2 BS 8233:2014: GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS (BS 8233)

2.2.1 This standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use.

2.2.2 The British Standard includes recommended internal and external noise level criteria which are applicable to dwellings for steady external noise sources. In accordance with the guidance from the British Standard, it is desirable that the internal ambient noise level does not exceed the guideline values set out in Table 2-1.

Table 2-1: Desirable Guideline Values from BS 8233

Activity	Location	Period	
		Daytime 07:00 to 23:00	Night-time 23:00 to 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 $L_{Aeq,8hour}$

2.2.3 Whilst BS 8233 recognises that a guideline value may be set in terms of SEL or L_{AFmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated.

2.2.4 It is common practice to adopt 45 dB L_{AFmax} as a criterion for typical events at night, based on the guidance from the World Health Organisation (WHO) *Guideline for Community Noise* 1999 and *Environmental Noise Guidelines for the European Region* 2018. Therefore, this criterion has been adopted for this assessment.

2.2.5 With respect to external amenity space such as gardens and patios, it is stated that it is desirable that the 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. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres, urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

3 BASELINE NOISE SURVEY

3.1 OVERVIEW

3.1.1 A baseline noise survey has been undertaken to determine the prevailing noise climate across the proposed development site.

3.1.2 During the survey, it was noted that the dominant source of noise on the site was the passage of vehicles along Froghall Road.

3.2 MEASUREMENT LOCATION

3.2.1 A measurement location was adopted adjacent Froghall Road to the north of the site. The measurement location was chosen to determine the daytime and night-time noise levels generated by Froghall Road. The measurement location is shown in Figure 3-1.

Figure 3-1: Measurement Location

3.2.2 Measurement Location 1 was 1.5 m above local ground level and at 5 m from the nearside kerb edge of Froghall Road in free-field conditions. Monitoring was undertaken over a 24-hour period starting at 16:30 on 29th June 2021.

3.3 EQUIPMENT

3.3.1 The baseline noise survey was undertaken using the Class 1 specification noise measurement equipment detailed in Table 3-1. The measurement equipment was calibrated using a portable calibrator immediately before and after the measurements with no significant drift in calibration observed. The sound level meter, pre-amplifier and microphone were calibrated to traceable standards within 24 months prior to the measurements. The portable calibrator was calibrated within 12 months prior to the measurements.

Table 3-1 – Equipment Details

Item	Make & Model	Serial Number	Calibration Due
Sound Level Meter	01 dB Fusion	11327	05/05/23
Pre-Amplifier	Grass 40CE	259479	
Microphone	01 dB PRE 22	1605201	
Calibrator	01dB-Stell Cal 21	34675335	19/11/2021

3.4 WEATHER CONDITIONS

3.4.1 Weather conditions during the survey were conducive to environmental noise monitoring, it being dry with wind speeds below 5 m/s at the measurement location.

3.5 RESULTS

3.5.1 A summary of the measured noise levels at Measurement Location 1 is included in Table 3-2 below, full survey results are included in Appendix B.

Table 3-2 – Measured Sound Pressure Levels at Measurement Location 1

Start Time and Date	Period	dB $L_{Aeq,T}$	dB L_{AFmax}[1]
16:30 29/06/2021	Daytime (16-hours)[2]	61	-
23:00 29/06/2021	Night-time (8-hours)	53	78

[1] 90th percentile of measured $L_{AFmax,15min}$ values during the night-time period.
[2] Includes the periods between 16:30 to 23:00 on 29/06/2021 and from 07:00 to 16:30 on 30/06/2021.

4 ASSESSMENT

4.1 NOISE MODEL

4.1.1 A detailed computer based acoustic model of the site was generated in order to predict the daytime and night-time noise propagation across the site. The noise model was generated applying the following methodology:

- The model was generated using the PC based CadnaA® noise modelling package;
- The noise model was set to apply the prediction methodology from the Department of Transport document *Calculation of Road Traffic Noise* (CRTN) 1988 for the prediction of L_{Aeq} noise levels from Froghall Road;
- To reflect local ground cover, ground absorption was set to G=1 (100% absorptive ground);
- The model accounted for the screening afforded by existing buildings in the vicinity of the site;
- Noise emissions from Froghall Road were calibrated to the measured noise levels at Measurement Location 1; and
- L_{AFmax} noise levels from Froghall Road have been predicted using a simplified model of a 6 dB reduction in noise level per doubling of distance from the nearside edge of Froghall Road.

4.2 EXTERNAL NOISE LEVELS

4.2.1 Figure 4-1 and Figure 4-2 show the predicted noise levels across the site from Froghall Road at a height of 1.5 m, during the daytime and night-time respectively, without the screening afforded by the proposed development. The predicted noise levels without the development can be used to undertake a Stage 1 assessment in accordance with the ProPG.

Figure 4-1: Predicted Daytime Noise Levels (dB $L_{Aeq,16h}$) at 1.5 m Height

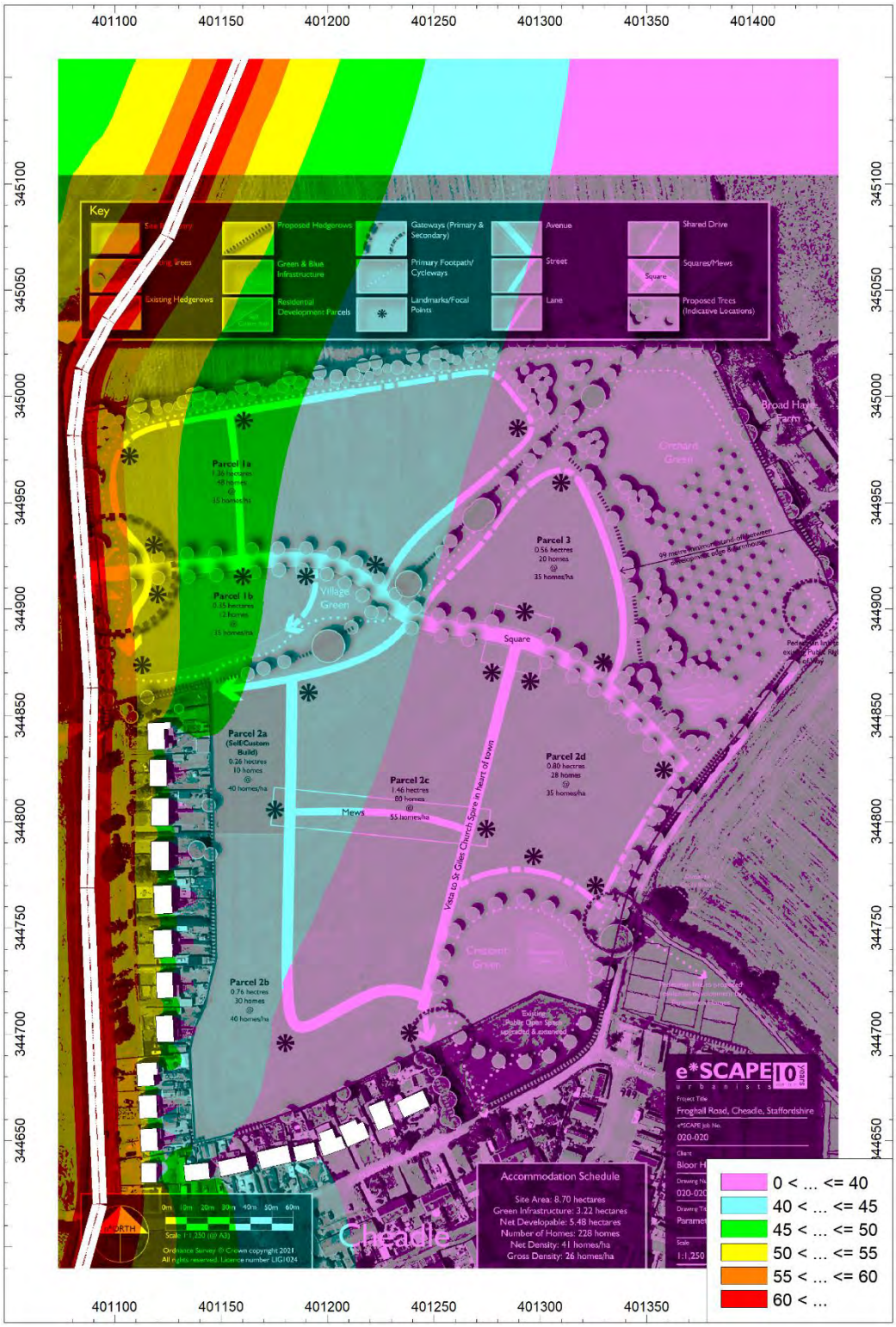
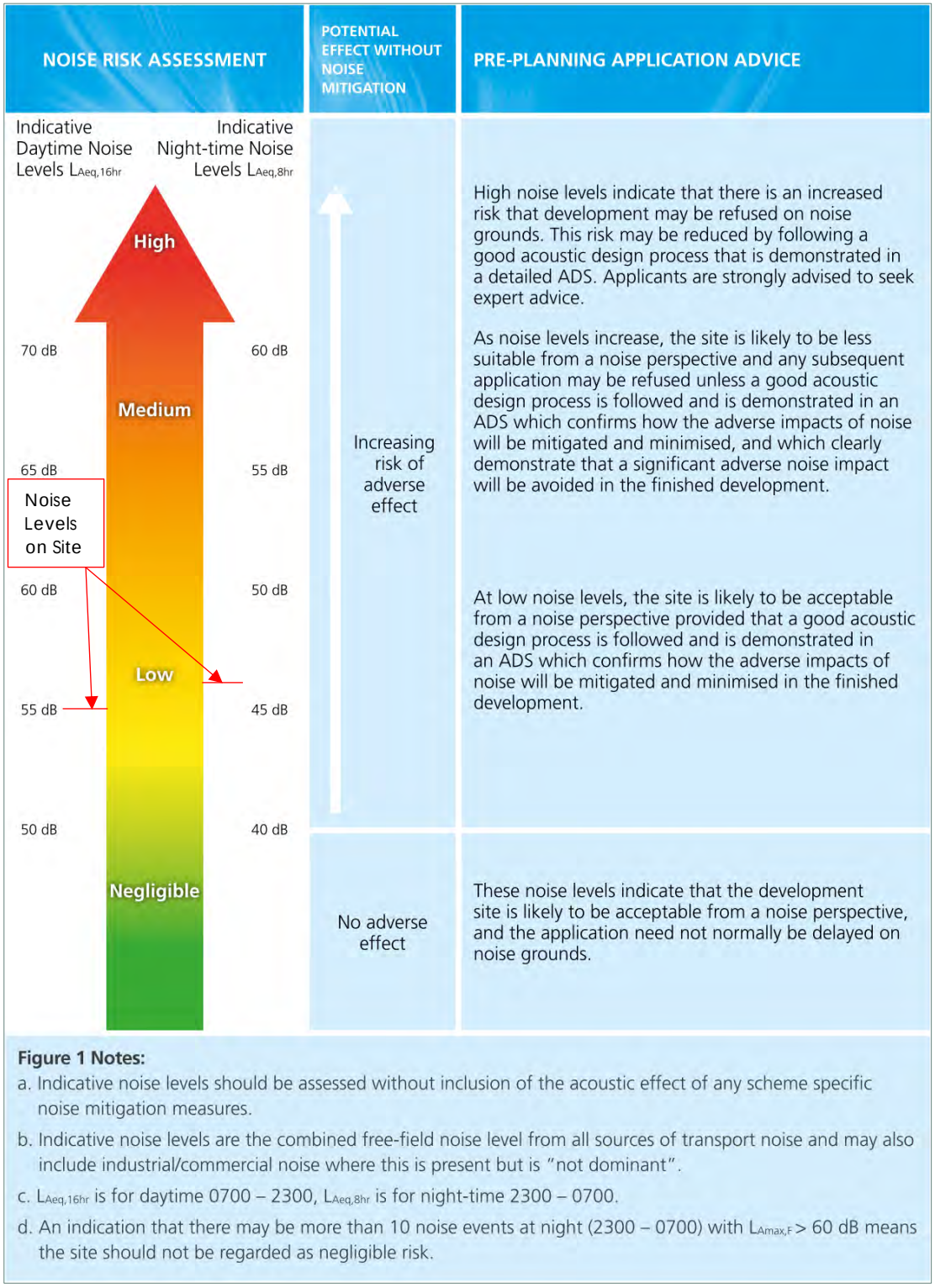


Figure 4-2: Predicted Night-time Noise Levels (dB $L_{Aeq,8h}$) at 1.5 m Height

4.2.2 It can be seen from Figures 4-1 and 4-2 that the closest areas to Froghall Road proposed for residential development are subject to noise levels of circa 55 dB and 47 dB during the daytime and night-time respectively.

Figure 4-3: Stage 1 Initial Site Noise Risk Assessment



4.2.3 It can be seen from Figure 4-3 that L_{Aeq} noise levels at the closest areas to Froghall Road proposed for residential development would be in the 'low' risk category due to road traffic noise. The related application advice is that '*the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed*'.

4.2.4 The external noise levels at the closest proposed residential areas to Froghall Road are predicted to achieve the 55 dB upper limit guideline value from BS 8233. Areas further from the road will be subject to lower noise levels.

4.2.5 Given that the upper limit guideline value is predicted to be achieved at the worst affected areas of the site, it is considered that further mitigation measures are unwarranted.

4.3 INTERNAL NOISE LEVELS

4.3.1 Two assessment locations that are representative of the closest proposed residential areas to Froghall Road were included in the noise model. The assessment locations are shown in Figure 4-4.

Figure 4-4: Assessment Locations

4.3.2 The noise levels at Assessment Locations 1 and 2 were predicted at 1.5 m height (ground floor height) during the daytime and 4.0 m height (first floor height) during the night-time. The predicted noise levels are shown in Table 4-1.

Table 4-1 – Predicted Noise Levels at Assessment Locations 1 and 2

Assessment Location	Period	dB $L_{Aeq,T}$	dB L_{AFmax}
1	Daytime (16-hours)	55	-
	Night-time (8-hours)	49	67
2	Daytime (16-hours)	55	-
	Night-time (8-hours)	49	67

4.3.3 It can be seen from Table 4-1 that the predicted noise levels at Assessment Locations 1 and 2 are the same to the nearest 1 dB.

4.3.4 Internal noise levels can be predicted from external noise levels by applying a -15 dB correction, assuming the façade contains a partially open window. Table 4-2 below details the predicted internal noise levels with partially open windows.

Table 4-2 – Predicted Internal Noise Levels at Assessment Locations 1 and 2, with Partially Open Windows

Assessment Location	Period	dB $L_{Aeq,T}$	dB L_{AFmax}
1 and 2	Daytime (16-hours)	40	-
	Night-time (8-hours)	34	52

4.3.5 It can be seen from Table 4-2 and Table 2-1 that the predicted internal noise levels with partially open windows are between 4 and 5 dB above the desirable guideline values from BS 8233. BS 8233 states the following regarding noise levels 5 dB above the desirable guideline values:

> "*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.*"

4.3.6 Based on the above, it is anticipated that reasonable conditions would be achieved for spaces on the worst affected elevations of the first row of houses closest to Froghall Road, with partially open windows.

4.3.7 Given that the desirable guideline values are predicted to be exceeded with windows open, consideration has been given to internal noise levels with windows closed and ventilators open. In accordance with the 'Simple Calculation' from Section G.1 of BS 8233 internal noise levels can be estimated from external free-field noise levels, assuming closed windows, by subtracting the R_w sound insulation performance of the proposed glazing.

4.3.8 Thermally proficient double glazing with a configuration similar to 4 mm glass/ 12 mm air gap/ 4 mm glass has a sound insulation performance of circa 31 dB R_w. Standard window mounted trickle ventilators achieve a performance of circa 32 dB $D_{n,e,w}$ in the open position.

4.3.9 Based on the above performances and prediction methodology, the predicted internal noise levels would be as shown in Table 4-3. It is noted in BS 8233 that the simple calculation can underestimate internal noise levels by up to 5 dB. Therefore, a 5 dB uplift has been applied to the predicted noise levels to account for any potential underestimation.

Table 4-3: Internal Noise Levels in Worst Affected Spaces with Windows Closed and Trickle Ventilators Open

Assessment Location	Period	dB $L_{Aeq,T}$	dB L_{AFmax}
1 and 2	Daytime (16-hours)	29	-
	Night-time (8-hours)	23	41

4.3.10 It can be seen from Table 4-3 that the desirable internal guideline values from Table 3-1, will be achieved with windows closed and trickle ventilators open. Typical L_{AFmax} noise levels will also be below the 45 dB criterion from the WHO *Guidelines for Community Noise* 1999.

4.3.11 Given the findings of the above assessment, it is considered that any further mitigation measures are unwarranted.

5 CONCLUSION

5.1.1 JPM Acoustics Ltd has been appointed by Bloor Homes North West to undertake a noise impact assessment to support a planning application for a proposed residential development on land off Froghall Road in Cheadle, Staffordshire.

5.1.2 This noise impact assessment considers the impact of the existing noise environment on the proposed noise sensitive development.

5.1.3 The assessment has been undertaken with due consideration to relevant British Standards, National and Local Planning Policy and guidance documents relating to noise and draws on the results of a baseline noise survey undertaken in June 2021.

5.1.4 An assessment of the impact of road traffic noise on external amenity spaces has identified that the 55 dB upper limit guideline value is predicted to be achieved in all rear gardens and that the site is in the 'low' risk category from the ProPG.

5.1.5 An assessment of the impact of road traffic noise on internal spaces has identified that, even within the worst affected proposed dwellings, reasonable internal conditions would be achieved with windows open. With windows closed desirable internal conditions would be achieved, assuming standard double glazing and trickle ventilators.

5.1.6 Given the findings of this assessment, it is considered that noise need not be a determining factor in granting planning consent for the proposed development.

APPENDIX A: TECHNICAL GLOSSARY

Term	Descriptions
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level (Sound Level)	The sound level is the sound pressure relative to a standard reference pressure of 20 µPa ($20x10^{-6}$ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sound pressures S1 and S2 is given by $20 \log_{10}$ (S1 / S2). 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 µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
$L_{eq,T}$	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 during the 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.
$L_{90,T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. L_{90} can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5 m.
Façade	At a distance of 1 m in front of a large sound reflecting object such as a building façade.
Fast/Slow Time Weighting	Averaging times used in sound level metres.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit.

APPENDIX B – FULL SURVEY RESULTS

Start Date and Time	Duration	Measured Sound Pressure Level	
		dB $L_{Aeq,T}$	dB L_{AFmax}
29/06/2021 16:30	15-minutes	62	77
29/06/2021 16:45	15-minutes	65	92
29/06/2021 17:00	15-minutes	63	81
29/06/2021 17:15	15-minutes	61	76
29/06/2021 17:30	15-minutes	61	80
29/06/2021 17:45	15-minutes	62	87
29/06/2021 18:00	15-minutes	60	79
29/06/2021 18:15	15-minutes	58	76
29/06/2021 18:30	15-minutes	60	81
29/06/2021 18:45	15-minutes	60	86
29/06/2021 19:00	15-minutes	61	82
29/06/2021 19:15	15-minutes	59	79
29/06/2021 19:30	15-minutes	69	97
29/06/2021 19:45	15-minutes	59	77
29/06/2021 20:00	15-minutes	59	78
29/06/2021 20:15	15-minutes	60	77
29/06/2021 20:30	15-minutes	60	85
29/06/2021 20:45	15-minutes	58	79
29/06/2021 21:00	15-minutes	56	74
29/06/2021 21:15	15-minutes	55	74
29/06/2021 21:30	15-minutes	60	82
29/06/2021 21:45	15-minutes	56	78
29/06/2021 22:00	15-minutes	57	78
29/06/2021 22:15	15-minutes	56	77
29/06/2021 22:30	15-minutes	54	73
29/06/2021 22:45	15-minutes	61	88
29/06/2021 23:00	15-minutes	49	73
29/06/2021 23:15	15-minutes	45	74
29/06/2021 23:30	15-minutes	53	75
29/06/2021 23:45	15-minutes	50	74
30/06/2021 00:00	15-minutes	52	76
30/06/2021 00:15	15-minutes	51	78
30/06/2021 00:30	15-minutes	47	72
30/06/2021 00:45	15-minutes	48	74
30/06/2021 01:00	15-minutes	27	46

Start Date and Time	Duration	Measured Sound Pressure Level	
		dB $L_{Aeq,T}$	dB L_{AFmax}
30/06/2021 01:15	15-minutes	42	68
30/06/2021 01:30	15-minutes	44	70
30/06/2021 01:45	15-minutes	25	39
30/06/2021 02:00	15-minutes	49	78
30/06/2021 02:15	15-minutes	23	36
30/06/2021 02:30	15-minutes	22	34
30/06/2021 02:45	15-minutes	45	70
30/06/2021 03:00	15-minutes	28	42
30/06/2021 03:15	15-minutes	23	38
30/06/2021 03:30	15-minutes	50	78
30/06/2021 03:45	15-minutes	39	55
30/06/2021 04:00	15-minutes	44	55
30/06/2021 04:15	15-minutes	51	74
30/06/2021 04:30	15-minutes	49	71
30/06/2021 04:45	15-minutes	55	76
30/06/2021 05:00	15-minutes	53	78
30/06/2021 05:15	15-minutes	55	77
30/06/2021 05:30	15-minutes	57	78
30/06/2021 05:45	15-minutes	61	83
30/06/2021 06:00	15-minutes	56	76
30/06/2021 06:15	15-minutes	57	76
30/06/2021 06:30	15-minutes	59	75
30/06/2021 06:45	15-minutes	62	81
30/06/2021 07:00	15-minutes	60	77
30/06/2021 07:15	15-minutes	62	81
30/06/2021 07:30	15-minutes	62	81
30/06/2021 07:45	15-minutes	62	77
30/06/2021 08:00	15-minutes	62	77
30/06/2021 08:15	15-minutes	63	80
30/06/2021 08:30	15-minutes	63	77
30/06/2021 08:45	15-minutes	62	77
30/06/2021 09:00	15-minutes	62	82
30/06/2021 09:15	15-minutes	62	81
30/06/2021 09:30	15-minutes	61	76
30/06/2021 09:45	15-minutes	61	79
30/06/2021 10:00	15-minutes	62	80
30/06/2021 10:15	15-minutes	61	76

Start Date and Time	Duration	Measured Sound Pressure Level	
		dB $L_{Aeq,T}$	dB L_{AFmax}
30/06/2021 10:30	15-minutes	61	83
30/06/2021 10:45	15-minutes	62	81
30/06/2021 11:00	15-minutes	62	78
30/06/2021 11:15	15-minutes	60	76
30/06/2021 11:30	15-minutes	60	75
30/06/2021 11:45	15-minutes	60	78
30/06/2021 12:00	15-minutes	62	81
30/06/2021 12:15	15-minutes	61	79
30/06/2021 12:30	15-minutes	60	82
30/06/2021 12:45	15-minutes	60	81
30/06/2021 13:00	15-minutes	59	84
30/06/2021 13:15	15-minutes	60	76
30/06/2021 13:30	15-minutes	61	85
30/06/2021 13:45	15-minutes	62	84
30/06/2021 14:00	15-minutes	59	74
30/06/2021 14:15	15-minutes	61	81
30/06/2021 14:30	15-minutes	63	87
30/06/2021 14:45	15-minutes	63	78
30/06/2021 15:00	15-minutes	62	82
30/06/2021 15:15	15-minutes	60	76
30/06/2021 15:30	15-minutes	61	79
30/06/2021 15:45	15-minutes	60	74
30/06/2021 16:00	15-minutes	61	80
30/06/2021 16:15	15-minutes	62	78