



MEC
Consulting Group

ACOUSTICS

**Land off Ashby Road and Normandy Way,
Hinckley**
Acoustic Assessment
August 2026

Report Ref: 28420-ENV-0404 Rev A



Land off Ashby Road and Normandy Way, Hinckley

Acoustic Assessment

August 2026

REPORT REF: 28420-ENV-0404 Rev A

CLIENT: Miller Homes

ENGINEER: MEC Consulting Group Ltd
The Old Chapel
Station Road
Hugglescote
Leicestershire
LE67 2GB

Tel: 01530 264 753
Email group@m-ec.co.uk

REGISTRATION OF AMENDMENTS

Date	Rev	Comment	Prepared By	Checked By	Approved By
April 2026	-	First issue	Elliot Williams BSc (Hons) Assistant Acoustic Consultant	Harry Johnson BSc (Hons) AMIOA Senior Acoustic Consultant	Alexander Bennett BSc (Hons) MCIHT MTPS Managing Director
August 2026	A	Updating NPPF reference	Elliot Williams BSc (Hons) Assistant Acoustic Consultant	Daniel Newbery BSc(Hons) MIOA MEnvSc Senior Acoustics & Air Quality Consultant	Alexander Bennett BSc (Hons) MCIHT MTPS Managing Director

COPYRIGHT

The contents of this document must not be copied or reproduced in whole or part without the written consent of MEC Consulting Group Ltd.

EXECUTIVE SUMMARY

Site Address	Land off Ashby Road and Normandy Way, Hinckley
Site Description and Setting	The Site is located approximately 1.5 km north of Hinckley town centre and comprises two parcels of arable land. The northern parcel, near Rogue's Lane, Ashby Road, and the Hinckley & Bosworth Community Hospital, is influenced by road traffic and hospital activity. The southern parcel, bordered by residential properties and Normandy Way, is primarily affected by road traffic.
Proposed Development	Full planning application for the erection of 482 dwellings on land at Normandy Way and Ashby Road, Hinckley, comprising development across two parcels including: - the northern parcel (off Ashby Road) for residential development, public open space, play provision, structural landscaping, sustainable drainage infrastructure and the provision of a new vehicular route; - the southern parcel (off Normandy Way) for residential development, public open space, landscaping and drainage infrastructure. Together with associated access, internal roads, pedestrian and cycle connections, utilities and all other associated infrastructure.
Road Traffic Assessment	An environmental sound survey was undertaken between 11th and 17th January 2024 in accordance with BS 7445. A 3D acoustic model was developed using CadnaA to predict road traffic noise levels across the Site. Assessments were carried out in accordance with ProPG, BS 8233, AVOG and Approved Document O. <u>External Sound Levels</u> Predicted external sound levels indicate that the majority of garden areas achieve the BS 8233 criterion of 55 dB without mitigation. For the most exposed external amenity areas with a line of sight to Normandy Way, the BS 8233 upper criterion can be met with the provision of raised 2.0m and 2.2m high close boarded timber fencing. <u>Internal Sound Levels</u> Embedded façade mitigation measures have been suggested in order to achieve internal noise level criteria in line with BS 8233, ProPG and AVOG. Large portions of the Site can be satisfied through appropriate thermal double glazing coupled with either direct airpath window mounted trickle ventilators or acoustically attenuated trickle ventilators. For the most exposed dwellings, up-rated glazing and through wall trickle ventilators have been demonstrated to meet the relevant internal criteria.
Commercial Assessment	A BS 4142 assessment has been undertaken, with the Initial Numerical Impact Assessment for the most exposed plot to the Hinckley & Bosworth Community Hospital indicating a 'Low' impact during the daytime and a potential 'Adverse' impact at night-time, depending on context. When contextual factors are considered, daytime garden sound levels are expected to be significantly lower than façade predictions due to rear garden locations benefiting from building and boundary screening. Whilst night-time façade exceedances are expected to be substantially reduced internally due to attenuation provided by the building envelope, with standard mitigation measures such as appropriate glazing and acoustic ventilation further reducing internal noise.
Overheating Assessment	External façade levels at the most exposed plots to Ashby Road and Normandy Way represent a 'High' risk of overheating under AVOG Level 1, whilst the most exposed plots to Rogue's Lane do not require an AVOG Level 2 assessment due to the 'Negligible' risk. A Level 2 assessment found that the use of room-specific mechanical ventilation systems achieves the relevant internal acoustic criteria.
Conclusions	The Site is suitable for residential development, subject to the implementation of the recommended mitigation measures. External amenity targets can largely be achieved, with localised enhanced boundary fencing required for some plots. Internal noise standards can be met through appropriate façade design and ventilation strategies, with mechanical ventilation required to maintain compliance during overheating conditions.
Recommendations	- Provide up to 2.0m and 2.2m high close-boarded timber fencing at the most exposed gardens where required. - Install glazing and ventilation systems in accordance with the mitigation schedule including uprated glazing and acoustically rated through wall vents for the most dwellings.

- 
- Incorporate room-specific mechanical ventilation (or a whole-dwelling MVHR system) for plots requiring overheating mitigation.
 - Ensure any mechanical ventilation systems meet the noise limits set out in AD-F and AVOG.
 - Review and refine ventilation and overheating mitigation at Building Control stage following any dynamic thermal modelling.

This summary should be read in conjunction with the full report and reflects an assessment of the site based on information received by MEC at the time of production.



CONTENTS

1.0	INTRODUCTION	6
2.0	STANDARDS AND GUIDANCE	8
3.0	ENVIRONMENTAL SOUND SURVEY	13
4.0	ASSESSMENT METHODOLOGY	21
5.0	ROAD TRAFFIC ASSESSMENT	24
6.0	ACOUSTICS LED OVERHEATING ASSESSMENT	26
7.0	COMMERCIAL ASSESSMENT	30
8.0	MITIGATION	33
9.0	CONCLUSIONS	35

APPENDICES

A.	PLANNING LAYOUT
B.	ACOUSTIC GLOSSARY
C.	ENVIRONMENTAL SOUND SURVEY DATA
D.	ROAD TRAFFIC SOUND LEVEL CONTOUR MAPS
E.	COMMERCIAL SOUND LEVEL CONTOUR MAPS
F.	GHA TOOLKIT TABLE
G.	MITIGATION REFERENCE DRAWINGS
H.	GLAZING AND VENTILATION PERFORMANCE REQUIREMENTS

1.0 INTRODUCTION

- 1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Miller Homes (hereafter referred to as 'the Client'), to undertake an Acoustic Assessment for a proposed residential development on Land off Ashby Road and Normandy Way, Hinckley (hereafter referred to as 'the Site').

Existing Site

- 1.2 The Site is located approximately 1.5 km north of Hinckley town centre and comprises two separate parcels, both currently composed of arable land.
- 1.3 The northern parcel is bounded by Rogue's Lane to the north; Ashby Road to the east; further arable land and Hinckley & Bosworth Community Hospital to the south; and additional arable land to the west. The principal noise sources affecting the northern parcel are anticipated to be local road traffic, together with potential contributions from the adjacent hospital.
- 1.4 The southern parcel is bounded by arable land, with a farm beyond, to the north; residential dwellings to the east with Ashby Road beyond; Normandy Way to the south; and further arable land to the west. The principal noise source affecting the southern parcel is anticipated to be local road traffic.
- 1.5 The approximate redline boundaries of the Site are presented in Figure 1.1.

Figure 1.1: Approximate Redline Boundaries



Development Proposals

- 1.6 The development proposals comprise of the following:

“Full planning application for the erection of 482 dwellings on land at Normandy Way and Ashby Road, Hinckley, comprising development across two parcels including:

- *the northern parcel (off Ashby Road) for residential development, public open space, play provision, structural landscaping, sustainable drainage infrastructure and the provision of a new vehicular route;*
- *the southern parcel (off Normandy Way) for residential development, public open space, landscaping and drainage infrastructure.*

Together with associated access, internal roads, pedestrian and cycle connections, utilities and all other associated infrastructure.”

1.7 A planning layout is presented in **Appendix A**.

Assessment Scope

1.8 The following scope of works has been undertaken:

- An environmental sound survey has been undertaken within the site in order to determine the prevailing acoustic conditions;
- An acoustic model has been created in order to predict sound levels across the Site for comparison against relevant criteria contained within ProPG¹, BS 8233² and AVOG³ with consideration given to the acoustic criteria contained in AD-O⁴;
- Where necessary, sound levels from the existing Hinckley & Bosworth Community Hospital adjacent to the northern parcel have been monitored and have been assessed against the guidance outlined in BS 4142⁵; and
- Where required, appropriate mitigation measures have been provided to demonstrate compliance with the relevant standards.

1.9 The conclusions of this report aim to demonstrate to the Local Authority that external and internal acoustic conditions will be compliant with the relevant British Standards and Acoustic Guidance.

Disclaimer

1.10 MEC has completed this report for the benefit of the individuals referred to in Paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.11 MEC accepts no responsibility or liability for:

- The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
- The issue of this document to any third party with whom approval for use has not been agreed.

¹ Professional Practice Guidance on Planning and Noise, May 2017.

² BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

³ Acoustics Ventilation and Overheating, Residential Design Guide, V1.1. January 2020.

⁴ The Building Regulations 2010, Overheating, Approved Document 'O'.

⁵ BS 4142:2014 +A1:2019 'Methods for rating and assessing industrial and commercial sound.'

2.0 STANDARDS AND GUIDANCE

General

2.1 An acoustic glossary is provided in **Appendix B** to assist the reader.

Summary of Guidance and Standards

2.2 The following guidance and standards relevant to the assessment are outlined below:

- National Planning Policy Framework (NPPF) 2026;
- Noise Policy Statement for England (NPSE) 2010;
- Professional Practice Guidance on Planning and Noise (ProPG) 2017;
- BS 8233:2014 '*Guidance on sound insulation and noise reduction for buildings*,'
- Acoustics, Ventilation and Overheating Guide (AVOG) 2020; and
- BS 4142:2014 +A1:2019 '*Methods for rating and assessing industrial and commercial sound*'.

2.3 For conciseness, the guidance and standards most appropriate to this assessment are summarised in this section.

Noise Policy Statement for England (NPSE)

2.4 The guidance of the Noise Policy Statement for England (NPSE) applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise, but does not apply to noise in the workplace (occupational noise). It introduces the concepts of 'No Observed Effect Level' (NOEL), which is the level below which there is no detectable effect on health and quality of life due to the noise; the 'Lowest Observed Adverse Effect Level' (LOAEL), which is the level above which adverse effects on health and quality of life can be detected; and the 'Significant Observed Adverse Effect Level' (SOAEL), which is the level above which significant adverse effects on health and quality of life occur.

2.5 In March 2014, the Department for Communities & Local Government updated its on-line planning guidance to assist with interpretation of the original NPPF and the NPSE. The guidance covered general matters such as relevance of noise issues, noise concerns and factors, how to determine impacts, and mitigation. To assist with recognising when noise could be a concern, the guidance summarises the noise exposure hierarchy as follows, based on the likely average response.

Table 2.1: Noise Exposure Hierarchy Based on Likely Average Response

Perception	Examples of Outcomes	Increasing Effect Level	Action
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			
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			
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

Professional Practice Guidance on Planning and Noise – ProPG

- 2.6 ProPG seeks to secure good acoustic design for new residential developments. The guidance includes a framework to enable situations where noise is not an issue but to help identify the extent of risk at noisier sites. The guidance does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy.
- 2.7 The guidance is restricted to sites that are exposed predominantly to noise from transportation sources. Where industrial or commercial noise is present on the site but is “not dominant”, its contribution may be included in the noise level used to establish the degree of risk. However, if the industrial/commercial source is dominant, an assessment in accordance with BS 4142⁶ should be conducted.
- 2.8 A two-stage approach is considered whereby:
- Stage 1 – an initial noise risk assessment of the proposed development site is undertaken;
 - Stage 2 – a systematic consideration of internal and external noise levels is considered ensuring good acoustic design and consideration of other relevant issues is recognised.
- 2.9 ProPG also references the World Health Organisation (WHO) guidance on maximum noise levels at night. Guidance from the WHO states that indoor sound pressure levels should not exceed approximately 45 dB L_AF_{max} more than 10 – 15 times per night. ProPG indicates that individual noise events do not exceed

⁶ BS 4142:2014 +A1:2019 ‘Methods for rating and assessing industrial and commercial sound.’

45 dB L_{AFmax} more than 10 times a night and therefore this is considered as criteria in addition to that outlined in Table 2.2.

- 2.10 Whilst ProPG does not define a measurement interval for the assessment of L_{AFmax} levels, research⁷ has been undertaken which indicates that, for Maximum Event Level assessments, a sampling interval of between 1 and 3 minutes relates most closely to how awakening events are experienced by people in reality when compared to longer sampling periods.
- 2.11 For brevity, within the study, the majority of people (circa 75-85%) under test returned to a sleep state by approximately 2.5 minutes after the initial awakening event.
- 2.12 In summary, a longer sampling period can result in the under assessment of the 10th highest maximum level, therefore, based upon research and the recommendation of the Institute of Acoustics (IOA), a sample measurement of 1 minute has been used to inform this assessment.
- 2.13 Upon completion of the ProPG's Stage 1 and 2 assessments, the findings should enable one of four possible recommendations to be presented to the decision maker, namely to grant permission without conditions, grant with conditions, 'avoid' or 'prevent'.

BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

- 2.14 BS 8233 provides recommendations for the control of noise in and around buildings.
- 2.15 The guidance provided includes appropriate internal and external noise level criteria which are applicable to residential buildings exposed to steady external noise sources. It is stated in the British Standard that it is desirable for internal ambient noise levels to not exceed the criteria set out in Table 2.2.

Table 2.2: BS 8233: 2014 Table 4 – Indoor Ambient Noise Levels for Dwellings

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

- 2.16 Additional guidance in BS 8233 indicates that appropriate ventilation should be provided, if relying on closed windows to meet the guide values, and that such ventilation should not compromise the façade insulation and resulting noise levels.
- 2.17 BS 8233 additionally includes guidance on external amenity areas whereby it states that external noise levels should not exceed 50 dB $L_{Aeq, T}$ with an upper guideline of 55 dB $L_{Aeq, T}$ which would be acceptable in noisier environments.

⁷ Paxton et al., Assessing L_{max} for residential development: The AVO Guide Approach, Institute of Acoustics, 2019

Acoustics, Ventilation and Overheating Guide – AVOG

- 2.18 AVOG outlines a methodology for the assessment of airborne sound during overheating conditions, and emphasises the co-dependency of acoustics, ventilation and overheating design.
- 2.19 Many developments require closed windows to provide good internal acoustic conditions which is in direct contrast to residents opening windows to keep a building cool. These opposing requirements are becoming a significant issue in residential building design as only one environmental comfort is then possible: either comfortable noise levels with windows closed or thermal comfort with windows open.
- 2.20 AVOG prescribes a two-level assessment procedure, the first stage is based upon external sound levels and provides a risk of adverse acoustic conditions during periods of overheating. The second stage is a formal assessment which considers both internal acoustic conditions and increased ventilation during overheating concurrently, and is typically reserved for detailed design stage.
- 2.21 A Level 2 AVOG assessment gives consideration to internal noise levels on a sliding scale depending on the likelihood and duration of overheating, with the potential for internal adverse effect levels described as follows:
- NOAEL – No Observed Adverse Effect Level (no effect can be detected, typically BS 8233 criteria);
 - LOAEL – Lowest Observed Adverse Effect Level (adverse effects start to be detected); and
 - SOAEL – Significant Observed Adverse Effect Level (significant adverse effects on health and quality of life occur).
- 2.22 An interpretation of the sliding scale within AVOG is presented in Table 2.3.

Table 2.3: AVOG Level 2 Criteria, dB

Effect Level	Internal Noise Level Criteria	
	Daytime $L_{Aeq,16hr}$	Night-time $L_{Aeq,8hr}$
NOAEL	< 35	< 30
LOAEL	35	30
SOAEL	40 – 50	35 – 42
Note: As internal noise levels rise from LOAEL to SOAEL, there is an increasing risk of an adverse effect level and mitigation measures may be required. Furthermore, SOAEL is dependent on how often overheating is likely to occur as higher noise levels may only be tolerable for shorter periods.		

- 2.23 With regards to maximum event exposure during periods of overheating, and whilst AVOG does present a fixed external criterion of 65 dB L_{AFmax} , the more stringent internal criterion of 55 dB L_{AFmax} contained within AD-O for Building Control purposes, will be used to define mitigation where it is found that maximum event levels drive the acoustic design.

BS 4142:2014 +A1:2019 'Methods for rating and assessing industrial and commercial sound'

- 2.24 BS 4142 describes methods for rating and assessing industrial and/or commercial sound and includes, but is not limited to, the assessment of:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical equipment;
- Sound from the (un)loading of goods and materials at industrial/commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes such as that from forklift trucks on or around an industrial and/or commercial site.

2.25 The methods described in BS 4142 use outdoor sound levels to assess the likely effects of sound on people who are typically outside residential premises. Although indoor effects can be indicated where the façade composition is known. A summary of the approach set out in BS 4142 is set out below:

- Establish or predict the specific sound level of the source(s) by considering both the ambient (includes the source to be assessed) and residual (excludes the source to be assessed but includes all remaining sources) sound level;
- Measure the representative background sound levels, typically by measuring close to the receptor location;
- Rate the specific sound level to account for any distinguishing characteristics (see below);
- Estimate the impact by subtracting the background sound level from the rating level; and
- Consider the initial estimate of impact, as determined above, in the context of the noise and its environment.

2.26 The specific sound level is rated to account for distinguishing characteristics by using penalties for tonality, impulsivity, intermittency and other sound characteristics. The dominant acoustic characteristic should be applied to avoid large penalties which is in accordance with the Institute of Acoustics response to BS 4142.

2.27 The character corrections are flexible according to whether the acoustic character is just perceptible at the noise receptor, or is clearly perceptible or highly perceptible, and range from 0 to 6 dB for tonal noise, 3 to 9 dB for impulsive noise, and 3 dB for other non-tonal/impulsive acoustic characteristics.

2.28 An initial estimate of impact of the specific sound is obtained by subtracting the background sound level from the rating level. Typically, the greater the difference, the greater the magnitude of impact.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;
- At differences lower than +5 dB a low impact is likely, depending on the context. The lower the rating level is to the measured background sound level, the less likely it is that the specific sound source will have an impact.

2.29 The results of the initial assessment should then be considered in light of all pertinent contextual factors.

3.0 ENVIRONMENTAL SOUND SURVEY

- 3.1 An environmental sound survey was undertaken between Thursday 11th and Wednesday 17th January 2024 to monitor noise emanating from road traffic on Normandy Way, Ashby Road, Rogue's Lane and potential activity from Hinckley & Bosworth Community Hospital and the farm immediately north of the southern parcel.
- 3.2 The survey was undertaken in full accordance with the guidance set out in BS 7445⁸.
- 3.3 Sound Level Meters (SLMs) were installed at six locations, as follows:
- Continuous Measurement 1 (CM1): approximately 5m from the carriageway edge of Rogue's Lane;
 - Continuous Measurement 2 (CM2): on the eastern boundary of the northern parcel, approximately 10m from the carriageway edge of Ashby Road;
 - Continuous Measurement 3 (CM3): on the southern boundary of the northern parcel, adjacent with Hinckley and Bosworth Hospital;
 - Continuous Measurement 4 (CM4): on the western boundary of the northern parcel, to get representative background sound levels for the BS 4142 assessment;
 - Continuous Measurement 5 (CM5): at the northern boundary of the southern parcel, approximately 40m from the nearby farm; and
 - Continuous Measurement 6 (CM6): on the southern boundary of the southern parcel, approximately 8m from Normandy Way.
- 3.4 It is noted that at CM5, an attended measurement was undertaken over a 30-minute period from 12:10 to 12:40 on Thursday 11th January 2024.
- 3.5 A monitoring location plan is provided in Figure 3.1.

⁸ BS 7445-1:2003 'Description and measurement of environmental noise, Part 1: Guide to quantities and procedures.'

Figure 3.1: Measurement Positions



Equipment

- 3.6 Measurements were taken using Class 1 integrating/averaging SLMs housed in environmental protection apparatus. The SLMs were installed in free field positions at a height of 1.5m above local ground level, and field calibrated before and after the survey using a Class 1 calibrator, with no significant drift in calibration noted.
- 3.7 The SLMs were set up to capture the following parameters at a minimum: L_{Aeq} , L_{A90} and L_{AFmax} values, and full details of the equipment used to undertake the survey are presented in Table 3.1.

Table 3.1: Equipment and Calibration Details

Measurement Position	Description	Manufacturer & Type No.	Serial No.	Calibration Due Date
CM1 & CM3	Sound Level Meter	Type NOR140	1407773	27/03/2025
	Pre-Amplifier	Type 1209	23168	
	Microphone	Type 1225	413180	
	Calibrator	Norsonic 1255	125525772	05/03/2024
CM2 & CM4	Sound Level Meter	Type NOR140	1407599	04/09/2024
	Pre-Amplifier	Type 1209	22646	
	Microphone	Type 1225	384571	
	Calibrator	Norsonic 1255	125525494	18/09/2024
CM5 & CM6	Sound Level Meter	Type NOR140	1407932	26/02/2025
	Pre-Amplifier	Type 1209	23695	
	Microphone	Type 1225	505583	
	Calibrator	Norsonic 1251	34315	07/04/2025

Meteorological Conditions

- 3.8 During setup of the monitoring equipment, weather conditions were cold and dry, with a gentle south westerly breeze of 0.7 m/s. On collection, weather conditions were cold and clear, with westerly winds of up to 2.4 m/s.
- 3.9 On review of online weather data (taken from www.timeanddate.com), it is understood that weather conditions appeared to be consistent with those observed on setup and collection of the equipment. It can therefore be concluded that there were no significant adverse meteorological conditions that could influence the survey outcomes.

Observations

- 3.10 Site observations indicate that the dominant noise source across the Site is road traffic from surrounding local roads. At CM3, adjacent to the Hospital, faint extract plant noise was audible.
- 3.11 No noise from the transformer within the Hospital yard or from agricultural activities to the northwest of the northern parcel was audible, and no dominant noise sources were identified that would warrant assessment under BS 4142.
- 3.12 Similarly, no noise was audible from the farm immediately north of the southern parcel during Site visits. Nevertheless, further investigation of the measured sound levels will be undertaken to determine if operations are audible on site.

Road Traffic Survey Results

- 3.13 Time history graphs for all monitoring positions are provided in **Appendix C**.
- 3.14 Table 3.2 to Table 3.4 provide a summary of measured sound levels at the continuous measurement positions adjacent to Rogues Lane, Ashby Road and Normandy Way.

Table 3.2: Summary of Measured Sound Levels at CM1, dB

Date	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00	
	L _{Aeq,T}	L _{Aeq,8hr}	Typical Maximum Event Level ^(a) L _{AFmax,1min}
Mon 15 th January	59 ^(b)	48	73
Tue 16 th January	59	47	75
Wed 17 th January	61 ^(c)	-	-
(a) Maximum noise level not exceeded more than 10 times per night. (b) T = 10hr (c) T = 7hr			

- 3.15 At CM1, the measured daytime L_{Aeq, T} ranged between 59 dB and 61 dB (rounding to the nearest whole number for assessment purposes), while the measured night-time L_{Aeq, 8hr} ranged between 47 dB and 48 dB.
- 3.16 For the purpose of the assessment the L_{Aeq,16hr} of 59 dB obtained over a full 16-hour period on Tuesday 16th January will be used. For the night-time, the highest L_{Aeq,8hr} of 48 dB will be used to provide a robust assessment.
- 3.17 Analysis of the night-time L_{AFmax, 1min} levels shows that the individual events did not exceed 75 dB more than 10 times during each measured night-time period. Investigation of the audio recordings shows that all values above 75 dB were caused by vehicular ‘pass-bys’, with no significant low frequency spectral content. Therefore, a value of 75 dB L_{AFmax, 1min} is considered appropriate for the assessment.

Table 3.3: Summary of Measured Sound Levels at CM2, dB

Date	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00	
	L _{Aeq,T}	L _{Aeq,8hr}	Typical Maximum Event Level ^(a) L _{AFmax,1min}
Mon 15 th January	63 ^(b)	56	72
Tue 16 th January	63	57	73
Wed 17 th January	64 ^(c)	-	-
(a) Maximum noise level not exceeded more than 10 times per night. (b) T = 9.75hr (c) T = 9hr			

- 3.18 At CM2, the measured daytime L_{Aeq, T} ranged between 63 dB and 64 dB, while the measured night-time L_{Aeq, 8hr} ranged between 56 dB and 57 dB.
- 3.19 The derived L_{Aeq,16hour} sound level of 64 dB will be used for the purpose of the daytime assessment. Whilst the highest L_{Aeq,8hr} of 57 dB will be used to provide a robust night-time assessment.
- 3.20 Analysis of the night-time L_{AFmax, 1min} levels shows that the individual events did not exceed 73 dB more than 10 times during each measured night-time period. Investigation of the audio recordings show that all values

above 73 dB were caused by vehicular ‘pass-bys’, with no significant low frequency spectral content. Therefore, a value of 73 dB $L_{AFmax, 1min}$ is considered appropriate for the assessment.

Table 3.7: Summary of Measured Sound Levels at CM6, dB

Date	Daytime 07:00 – 23:00	Night-time 23:00 – 07:00	
	$L_{Aeq,T}$	$L_{Aeq,8hr}$	Typical Maximum Event Level ^(a) $L_{AFmax,1min}$
Mon 15 th January	68 ^(b)	64	79
Tue 16 th January	69	64	80
Wed 17 th January	69 ^(c)	-	-
(a) Maximum noise level not exceeded more than 10 times per night. (b) T = 9hr (c) T = 7hr			

- 3.21 At CM6, ambient daytime $L_{Aeq, T}$ sound levels ranged between 68 dB and 69 dB, and for the night-time, the measured $L_{Aeq, 8hr}$ sound level was 64 dB across both the night-time periods.
- 3.22 Based on the above results, the daytime $L_{Aeq, 16hr}$ of 69 dB, which occurred over a full 16-hour period on Tuesday 16th January, and the measured night-time $L_{Aeq, 8hr}$ of 64 dB will be used for the purpose of the assessment.
- 3.23 Analysis of the night-time $L_{AFmax, 1min}$ levels shows that the individual events did not exceed 80 dB more than 10 times during the measured night-time period. This sound level was not exceeded by more than 5 dB throughout the duration of both night-time periods. Furthermore, audio recordings indicate that all levels above 80 dB are as a result of road traffic passing by the Site. Therefore, a value of 80 dB $L_{AFmax, 1min}$ is considered to be an appropriate typical maximum event level for the assessment.

Commercial Survey Results

- 3.24 In accordance with BS 4142, sound levels measured at CM3 and CM5 have been analysed over the specified reference time intervals (1-hour daytime and 15-minute night-time), and to avoid significant tabulation within the body of the report, the highest measured daytime and night-time periods for the survey period are presented in Table 3.8 and 3.9.

Table 3.8: Summary of Measured Sound Levels at CM3, dB

Date	Daytime 07:00 – 23:00		Night-time 23:00 – 07:00	
	Time Period	$L_{Aeq,1hr}$	Time Period	$L_{Aeq,15min}$
Thu 11 th January	15:00 – 16:00	53	06:15 – 06:30	50
Fri 12 th January	11:00 – 12:00	52	23:00 – 23:15	47
Sat 13 th January	12:00 – 13:00	50	06:45 – 07:00	47
Sun 14 th January	21:00 – 22:00	51	21:00 – 22:00	51
Mon 15 th January	13:00 – 14:00	51	13:00 – 14:00	-

- 3.25 At CM3 the highest daytime measurement of 53 dB $L_{Aeq,1hr}$ occurred on Thursday 11th January between the hour of 15:00 – 16:00. Whilst the highest night-time measurement of 52 dB $L_{Aeq,15mins}$ occurred on the morning of Sunday 15th January between the 15-minute period of 05:45 – 06:00.
- 3.26 Analysis of the audio recordings for the highest respective measurement period indicates that during the relevant time interval, the predominant noise was from extracts located on the Hospital, with occasional contributions from metal ‘clangs’ within the storage area.
- 3.27 Due to the identifiable operations at the Hospital, a BS 4142 assessment will be undertaken.

Table 3.9: Summary of Measured Sound Levels at CM5, dB

Date	Daytime 07:00 – 23:00		Night-time 23:00 – 07:00	
	Time Period	$L_{Aeq,1hr}$	Time Period	$L_{Aeq,15min}$
Thu 11 th January	15:00 – 16:00	54	06:15 – 06:30	51
	16:00 – 17:00		06:30 – 06:45	52
	17:00 – 18:00		06:45 – 07:00	52
Fri 12 th January	14:00 – 15:00	54	23:00 – 23:15	47
			23:30 – 23:45	
Sat 13 th January	16:00 – 17:00	55	06:45 – 07:00	49
Sun 14 th January	13:00 – 14:00	52	05:45 – 06:00	55
	15:00 – 16:00		06:30 – 06:45	54
	17:00 – 22:00		06:45 – 07:00	
Mon 15 th January	08:00 – 09:00	56	-	-
	18:00 – 19:00	57		

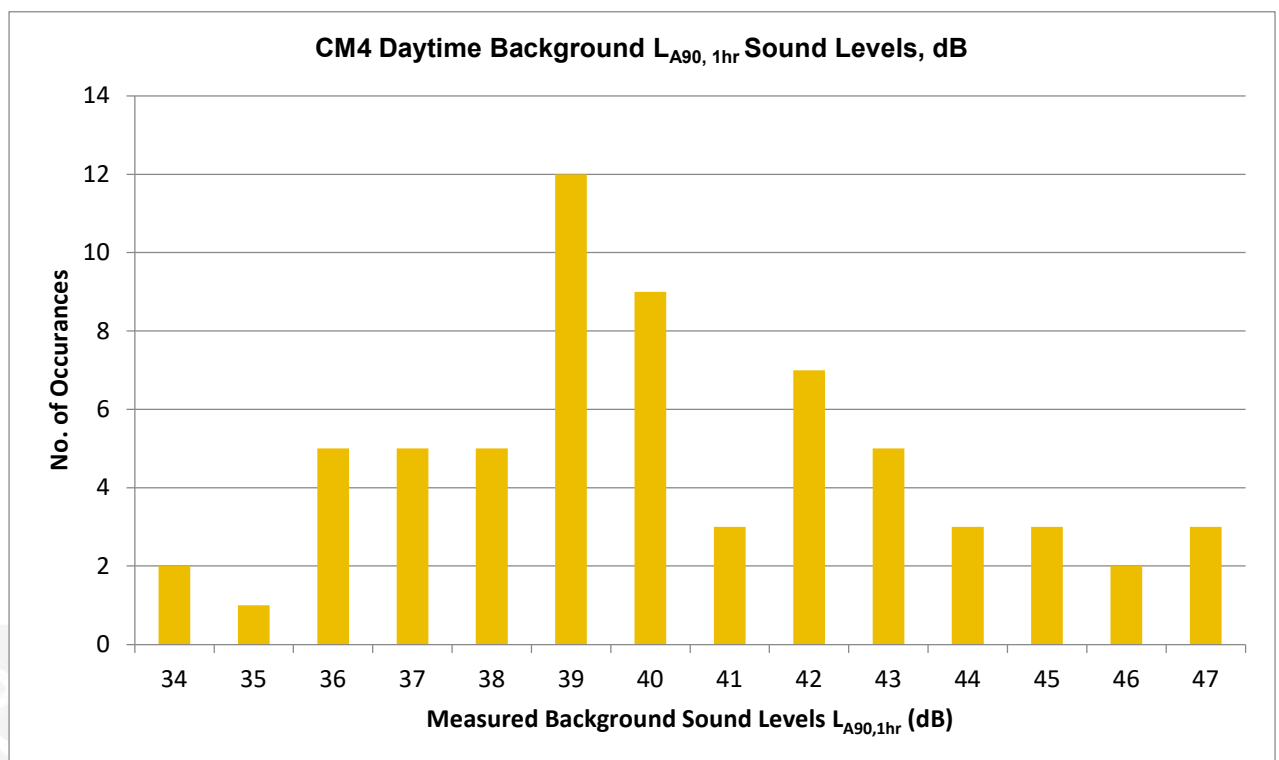
- 3.28 At CM5 the highest daytime measurement of 57 dB $L_{Aeq,1hr}$ occurred on Monday 15th January between the hour of 18:00 – 19:00. Whilst the highest night-time measurement of 55 dB $L_{Aeq,15mins}$ occurred on the morning of Sunday 14th January between the 15-minute period of 05:45 – 06:00.
- 3.29 Analysis of the audio recordings for the highest respective daytime and night-time measurement periods indicates that during the relevant time intervals, the predominant noise was from vehicles using the local transport network combined with other noises such as car alarms and bird song.
- 3.30 Further review of audio recordings captured during other peak noise periods indicates that no farm operations are audible at the Site.
- 3.31 Therefore, as no audible operations occurred during the measurement period, a BS 4142 assessment is not considered to be warranted for the farm.

Statistical Analysis of L_{A90} Data

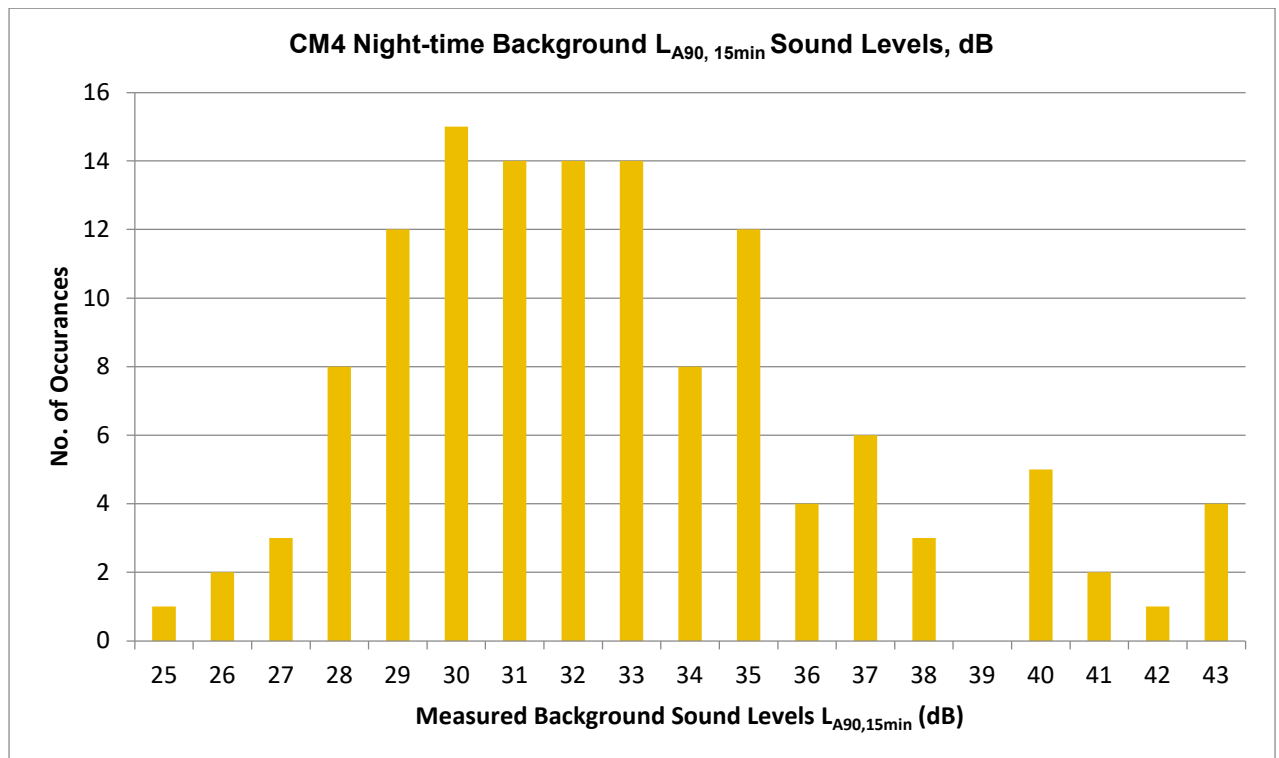
- 3.32 With regard to derivation of the L_{A90} background sound level for assessment purposes, CM4 is considered to be appropriately representative of typical conditions for the dwellings in close proximity to the Hospital, as it is located away from the nearby roads and Hospital operations, and is therefore considered robust.

- 3.33 Section 8 of BS 4142 makes it clear that the objective of the assessment “*is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.*”
- 3.34 Paragraph 8.14 of BS 4142 similarly remarks that “*The monitoring duration should reflect the range of background sound levels for the period being assessed. In practice, there is no ‘single’ background sound level as this is a fluctuating parameter. However, the background sound level used for the assessment should be representative of the period being assessed.*”.
- 3.35 The subsequent Note 1 states that “*A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value.*”.
- 3.36 A statistical analysis of the daytime $L_{A90, 1hr}$ and night-time $L_{A90, 15min}$ sound measurements, consistent with the BS 4142 advice, is shown in Figure 3.2 and Figure 3.3.

Figure 3.2: Statistical Analysis of Daytime Background Sound Levels $L_{A90, 1hr}$, CM4



- 3.37 During the daytime, the data shows a clear distribution pattern centred around 39 dB, with an overall range of daytime values extending from 34 to 47 dB $L_{A90, T}$. Therefore, 39 dB is considered to be an appropriate value to use for assessment purposes during the daytime.

Figure 3.3: Statistical Analysis of Night-time Background Sound Levels $L_{A90,15min}$, CM4

- 3.38 During the night-time, the data shows a more linear spread in values, with 30 dB occurring the most. Therefore, 30 dB is considered to be an appropriate value to use for assessment purposes during the night-time.

4.0 ASSESSMENT METHODOLOGY

Acoustic Modelling

- 4.1 An acoustic model of the Site and environs has been generated in Datakustik CadnaA® modelling software. The model was generated to determine noise levels across the Site and noise source emissions have been informed by survey data.
- 4.2 CadnaA® considers various inputs, including topography, buildings and road noise sources, and calculates sound levels in accordance with national and international standards; in this case, the relevant UK standards are the procedures set out within ISO 9613-2⁹.

Modelling Parameters

- 4.3 The modelling assumptions and input information for the acoustic model are as follows:
- Digital Terrain Model – Lidar 1m (Environment Agency, downloaded on 8th January 2023)
 - Open Street Map data (publicly available);
 - Ground absorption for the Site = 0.5 (mixed ground);
 - Building heights estimated following site observations or based upon masterplan;
 - First order reflections included in the modelling;
 - Temperature set to 10°C; and
 - Relative humidity set to 70%.

Road Traffic Assessment

- 4.4 Based on the environmental sound survey, the sound levels used to calibrate the roads in the 3D acoustic model are presented in Table 4.1.

Table 4.1: Sound Levels Used to Calibrate Acoustic Model, dB

Parameter	CM1 (Rogue's Lane)	CM2 (Ashby Road)	CM3 (Normandy Way)
Daytime Ambient L _{Aeq,16hr}	59	64	69
Night-time Ambient L _{Aeq,8hr}	48	57	64
Night-time Maximum L _{AFmax,1min}	75	73	80

Assessment Scenarios

- 4.5 With reference to the noise criteria outlined in Section 2.0 the acoustic model has been used to predict sound levels across the Site in the following scenarios:

⁹ ISO 9613-2 'Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation.'

- Daytime $L_{Aeq,16hr}$ external sound levels at ground floor (1.5m) height;
- Night-time $L_{Aeq,8hr}$ external sound levels at first floor (4m) height; and
- Night-time $L_{AFmax,1min}$ external sound levels at first floor (4m) height.

4.6 Sound level contour maps for the above scenarios are presented in **Appendix D**.

4.7 For conciseness, this report tabulates the most exposed receptors to give context to the most stringent mitigation measures. The most exposed dwelling to Rogue's Lane is Plot 35, the most exposed dwelling to Ashby Road is Plot 393, and the most exposed dwelling to Normandy Way is Plot 458.

4.8 All other receptors are assessed through the various sound level contour and mitigation reference drawings presented in the various appendices to this report.

Commercial Assessment

4.9 To account for the operations at Hinckley & Bosworth Community Hospital, a model has been generated to determine sound levels across the Site and source emissions have been informed by the highest 1-hour daytime sound level of 53 dB, which occurred between 15:00 and 16:00 hours. The extracts were audible for a total of 43-minutes, with metal clangs also noted during this period, and the ambient sound level was calculated to be 52 dB. For the remainder of the 1-hour period, when no contributions other than road traffic could be heard, a residual sound level of 52 dB was calculated, resulting in a specific sound level used to calibrate the acoustic model of 42 dB. This calculation is summarised in Table 4.2.

Table 4.2: Specific Sound Level Analysis, dB

Measurement Position	Date & Time	Measured sound Level		On-time Correction	Calculated Specific Sound Level ^(a)
		Ambient	Residual		
CM3	Thursday 11 th 15:00 – 16:00	52	52	-1	42
(a) Calculated using Formula 4, Section 7.3.14 of BS 4142					

4.10 In terms of the modelling methodology, point sources were used to represent the extraction units located at the rear of the hospital. In addition, an area source was applied across the hospital's storage area. These sources were incorporated into the model and calibrated to achieve a sound level of 42 dB.

4.11 It should be noted that for the night-time $L_{Amax,1min}$ assessment scenario, a sound level of 60 dB was assigned to the hospital storage area. This was considered alongside the maximum event noise levels associated with the respective roads, to provide a robust scenario.

4.12 With reference to the noise criteria outlined in Section 2.0, the acoustic model has been used to predict sound levels across the Site in the following BS 4142 assessment scenario:

- Daytime $L_{Aeq,1hr}$ external sound levels at ground floor (1.5m) height; and
- Night-time $L_{Aeq,15min}$ external sound levels at first floor (4m) height.

- 4.13 As with the road traffic assessment, the Nearest Sensitive Receptor (NSR) to the commercial operations will be tabulated within the report and all other receptors are assessed through the sound level contour drawings found in **Appendix E**.
- 4.14 The most exposed dwelling to Hinckley & Bosworth Community Hospital is Plot 315.



5.0 ROAD TRAFFIC ASSESSMENT

ProPG Initial Noise Risk Assessment

5.1 As required by the ProPG, an Initial Noise Risk Assessment (INRA) is presented in Table 5.1.

Table 5.1: Initial Site Noise Risk Assessment, dB

Risk	Negligible		Low		Medium		High	
Period	Day	Night	Day	Night	Day	Night	Day	Night
ProPG Threshold ^(a)	< 50	< 40	50 – 60	40 – 50	60 – 70	50 – 60	> 70	> 60
Plot 35			52	44				
Risk Assessment			Low					
Plot 393					63	58		
Risk Assessment					Medium			
Plot 458					68			64
Risk Assessment					Medium			High
^(a) L _{Aeq,16hr} dB for daytime assessment purposes and L _{Aeq,8hr} dB for night-time assessment purposes.								

- 5.2 Based on the modelled sound levels, receptors fall within the ProPG risk category of 'Low' during both the day and night-time for dwellings overlooking Rogue's Lane (Plot 35), for which the guidance states the Site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed.
- 5.3 The noise exposure increases to a 'Medium' risk for the most exposed dwellings overlooking Ashby Road (Plot 393) during the daytime and night-time, for which the guidance requires that the Site should follow a good acoustic design process which confirms how the adverse impacts of noise will be mitigated and minimised.
- 5.4 For the most exposed receptors to Normandy way (Plot 458), dwellings fall within the ProPG risk category of 'Medium' during the daytime, with the noise exposure increasing to a 'High' risk during the night-time, for which the guidance states the Site has an increased risk of being refused on noise grounds and should therefore follow a good acoustic design process that is demonstrated in an Acoustic Design Statement (ADS).
- 5.5 This report is considered to form the basis of the 'Acoustic Design Statement', which considers appropriate design measures to achieve suitable acoustic conditions for residential amenity.

External Amenity Criteria

- 5.6 The acoustic criterion often the most difficult to meet in residential environments situated next to busy transportation sources is BS 8233's criterion of 55 dB L_{Aeq,16hr} applicable to private external amenity spaces such as gardens.
- 5.7 It is noted that the Site generally follows good acoustic design principles, with dwelling frontages facing towards the surrounding roads and gardens located behind. The resulting daytime L_{Aeq,16hr} sound level contour map, shown on drawing 28420_04_120_13 in **Appendix D**, demonstrates that BS 8233's criterion

of 55 dB $L_{Aeq,16hr}$ will be satisfied at the vast majority of gardens across the Site without the need for any additional mitigation.

- 5.8 For the most exposed gardens which have a clear line of sight to Normandy Way (Plots 448 and 478) it has been shown that the 55 dB criterion can be achieved with the provision of increased garden fencing of up to 2m for Plot 448, and 2.2m for Plot 478.

Internal Acoustic Criteria

- 5.9 Table 5.2 presents the required external to internal reduction requirements for the most exposed dwellings.

Table 5.2: Required Façade Performance, dB

Plot	Parameter	External Level	Internal Criteria	Required Reduction ^(a)
35	Daytime Ambient $L_{Aeq,16hr}$	52	35	17
	Night-time Ambient $L_{Aeq,8hr}$	44	30	14
	Night-time Maximum $L_{AFmax,1min}$	68	45	23
393	Daytime Ambient $L_{Aeq,16hr}$	63	35	28
	Night-time Ambient $L_{Aeq,8hr}$	58	30	28
	Night-time Maximum $L_{AFmax,1min}$	74	45	29
458	Daytime Ambient $L_{Aeq,16hr}$	68	35	33
	Night-time Ambient $L_{Aeq,8hr}$	64	30	34
	Night-time Maximum $L_{AFmax,1min}$	80	45	35

- 5.10 For the most exposed receptor to Rogue's Lane (Plot 35), the results in Table 5.2 show that a sound reduction of up to 17 dB will be required to achieve the internal $L_{Aeq,16hr}$ criteria within habitable rooms during the daytime. Façade performance for bedrooms is driven by the night-time maximum scenario, with a sound reduction of up to 23 dB required to achieve the 45 dB L_{AFmax} criteria.
- 5.11 For the most exposed receptor to Ashby Road (Plot 393), a sound reduction of up to 28 dB will be required to achieve the internal $L_{Aeq,16hr}$ criteria within habitable rooms during the daytime. Façade performance for bedrooms is driven by the night-time maximum scenario, with a sound reduction of up to 29 dB required to achieve the 45 dB L_{AFmax} criteria.
- 5.12 For the most exposed receptor to Normandy Way (Plot 458), a sound reduction of up to 33 dB will be required to achieve the internal $L_{Aeq,16hr}$ criteria within habitable rooms during the daytime. Façade performance for bedrooms is driven by the night-time maximum scenario, with a sound reduction of up to 35 dB required to achieve the 45 dB L_{AFmax} criteria.

6.0 ACOUSTICS LED OVERHEATING ASSESSMENT

- 6.1 This part of the report considers the assessment of overheating in accordance with AVOG, and looks to determine whether an open windows acoustic strategy is permissible across the Site.

AVOG Level 1 Assessment

- 6.2 AVOG prescribes a two-stage assessment. Level 1 looks to determine if overheating needs to be considered further, based on the predicted external façade levels for the most exposed receptors.
- 6.3 The initial Level 1 assessment is presented in Table 6.1.

Table 6.1: AVOG Level 1 Assessment

Plot	Parameter	Predicted External Level dB	Level 1 Risk Grading	Level 2 Advised?
35	Daytime Ambient $L_{Aeq,16hr}$	52	Negligible	Not required
	Night-time Ambient $L_{Aeq,8hr}$	44		
393	Daytime Ambient $L_{Aeq,16hr}$	63	High	Recommended
	Night-time Ambient $L_{Aeq,8hr}$	58		
458	Daytime Ambient $L_{Aeq,16hr}$	68	High	Recommended
	Night-time Ambient $L_{Aeq,8hr}$	64		

- 6.4 The results demonstrate that for the most exposed receptors to Rogue's Lane an AVOG Level 2 assessment is not required. However, for the most exposed receptors to Ashby Road and Normandy Way an AVOG Level 2 is recommended due to the high external ambient sound levels.
- 6.5 It should also be noted that the night-time L_{AFmax} sound levels drive the acoustic design. Therefore, consideration will be given to internal sound levels during periods of overheating through a numerical assessment with comparisons also being made to internal acoustic criteria contained in AD-O.

AVOG Level 2 Assessment

Risk of Overheating

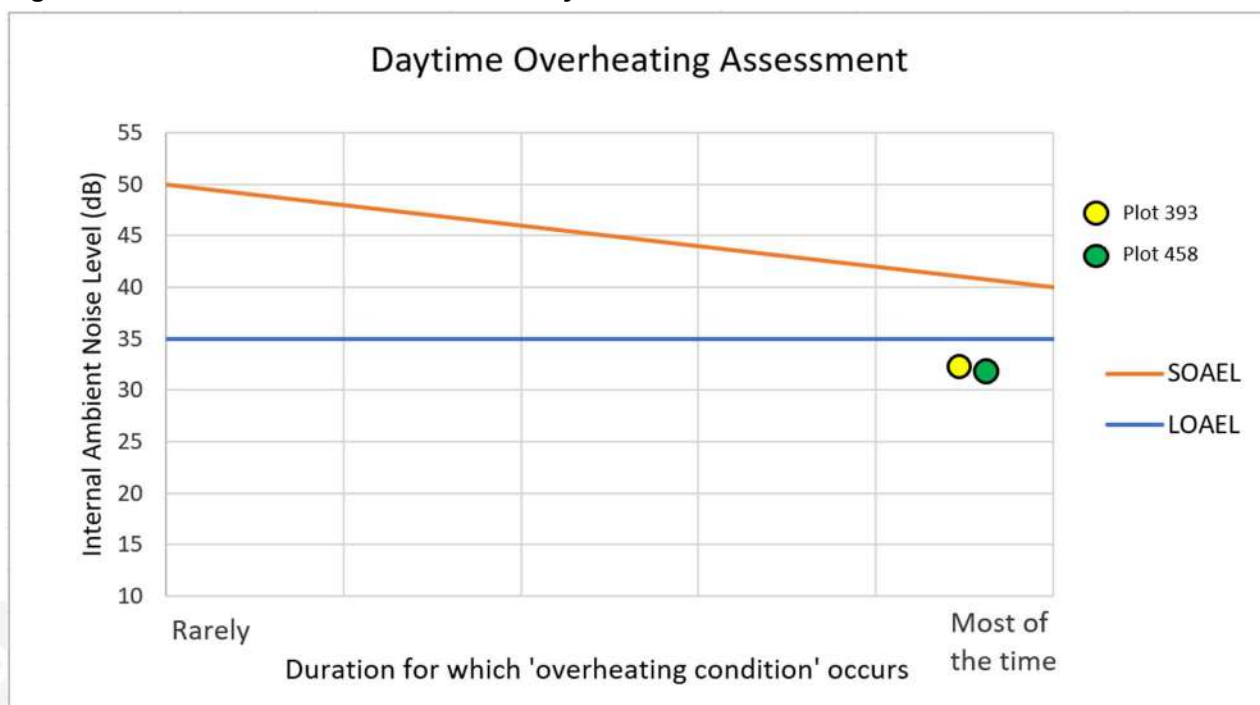
- 6.6 The likelihood of overheating can be determined via a qualitative assessment through the GHA Toolkit¹⁰.
- 6.7 A qualitative assessment using the GHA Toolkit is presented in **Appendix F**. The qualitative assessment indicates a 'High' risk of overheating, due to the fact that internal noise levels will be exceeded with windows open and therefore, the 'duration for which overheating occurs' is considered to be 'most of the time' in accordance with AVOG.
- 6.8 To combat overheating, an increased ventilation rate is typically required to remove excess heat from the property. The means in which increased ventilation can be achieved, without opening windows, is typically viable through a passive ventilator, such as a room specific mechanical ventilation system within affected habitable rooms, or whole dwelling Mechanical Ventilation with Heat Recovery (MVHR) systems where

¹⁰ Good Homes Alliance, Early-Stage Overheating Risk Tool, V1, July 2019 Toolkit

significantly high external noise levels are present. For the purpose of this assessment, a room specific MV system will be assumed.

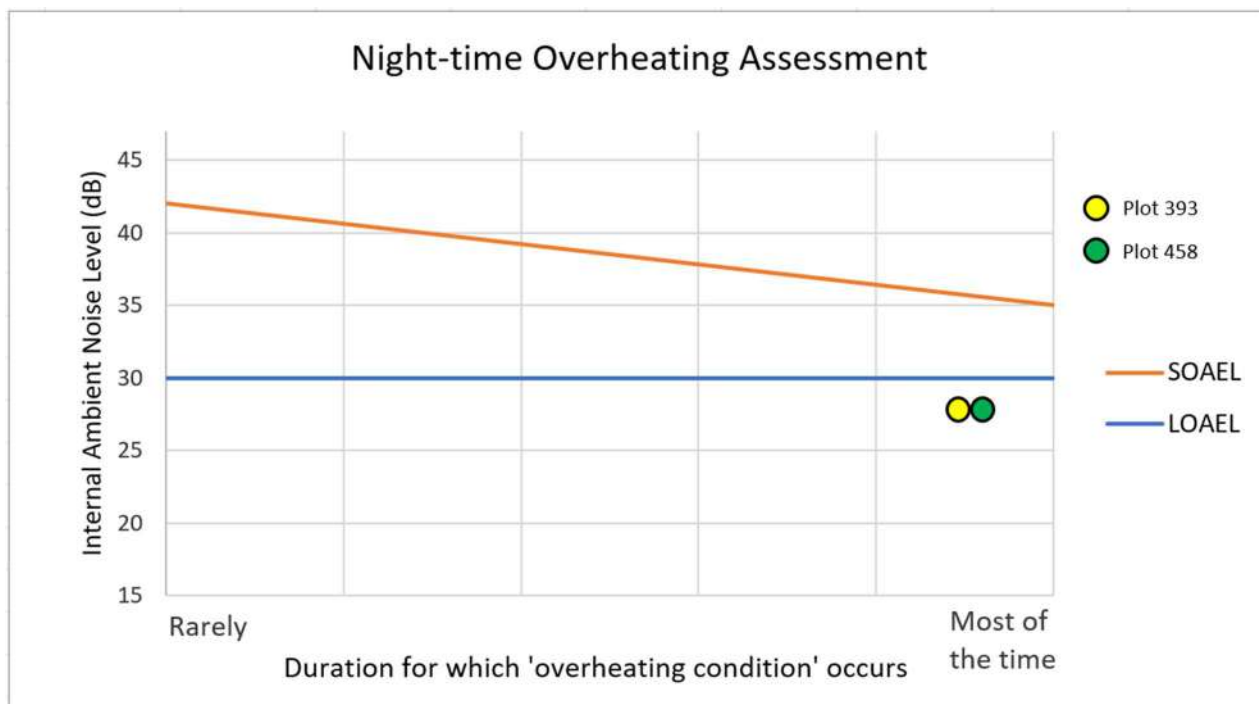
- 6.9 Calculations have been undertaken in accordance with BS 12354-3¹¹ to determine the predicted internal noise levels using the passive ventilation means for the most exposed plots based upon a 'High' risk of overheating in accordance with the GHA toolkit.
- 6.10 It is noted that this AVOG Level 2 Assessment can be seen as a worst-case scenario as the proposed ventilation measures would theoretically reduce the risk of overheating from that of a 'High' risk. Therefore, assuming a 'High' risk with the inclusion of the mitigation measures, would represent a robust assessment scenario.
- 6.11 The resulting AVOG Level 2 Assessment for Plot 393 and Plot 458 with the inclusion of a room specific MV system is presented in Figure 6.1 and Figure 6.2.

Figure 6.1: AVOG Level 2 Assessment of Daytime Conditions – Plot 393 & Plot 458



¹¹ BS EN ISO 12354-3:2017 'Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound.'

Figure 6.2: AVOG Level 2 Assessment of Night-time Conditions – Plot 393 & Plot 458



6.12 The results in Figure 6.1 and Figure 6.2 indicate that internal noise levels using a room specific MV system would lie substantially below the LOAEL.

Acoustic led Overheating Assessment – Numerical Summary

6.13 Table 6.2 presents a summary numerical assessment for overheating conditions using a room specific MV system as a means of additional ventilation for the most exposed dwellings.

Table 6.2: Overheating Acoustics Assessment, dB

Plot	Parameter ^(a)	Criteria	Calculated Internal Level
393	Daytime Ambient $L_{Aeq,16hr}$	40	33
	Night-time Ambient $L_{Aeq,8hr}$	35	28
	Night-time Maximum $L_{AFmax,1min}^{(b)}$	55	44
458	Daytime Ambient $L_{Aeq,16hr}$	40	32
	Night-time Ambient $L_{Aeq,8hr}$	35	28
	Night-time Maximum $L_{AFmax,1min}^{(b)}$	55	44
^(a) $L_{Aeq,T}$ criteria chosen as a point on the SOAEL based upon a high risk of overheating. ^(b) L_{AFmax} criterion as presented within AD-O.			

6.14 The information in Table 6.2 demonstrates that, with the inclusion of room specific MV systems, AVOG and AD-O criteria are comfortably satisfied.

- 6.15 However, it should be noted that the above indicative ventilation strategy is based on the qualitative GHA Toolkit, which does not take into consideration mechanical ventilation flow rates needed to satisfy CIBSE TM59¹².
- 6.16 Therefore, the mitigation schedule may be subject to change at Building Control stage based upon the outcome of any Dynamic Thermal Modelling undertaken to satisfy the requirements of AD-O.
- 6.17 It should be noted that where room specific mechanical ventilation systems are used to achieve suitable ventilation measures for overheating, whole dwelling ventilators (such as window mounted trickle vents) will also need to be included.
- 6.18 However, if a whole dwelling MVHR system is to be installed, this would negate the need to install whole dwelling ventilation solutions for typical conditions (window mounted trickle vents).
- 6.19 In any event, such measures should not influence the planning decision due to the fact that, as shown in this assessment, acoustic conditions have been considered during periods of overheating, and Environmental Health matters will be satisfied with an appropriate ventilation strategy.

Mechanical Ventilation System Limits

- 6.20 Any mechanical system included in the Site should adhere to the noise limits outlined in Table 6.3 for AD-F purposes and, ideally target the guidance values for overheating conditions.
- 6.21 The purpose of the guidance values during overheating periods is due to the fact that research indicates any increase in the noise produced by Mechanical Systems during periods of overheating, above that outlined below, is likely to result in residents turning off, or reducing the performance of such systems, which would result in a poor living environment. Once a Mechanical & Electrical engineer has specified the system to be installed, further acoustic calculations should be undertaken to determine appropriate in-line attenuation measures accordingly.
- 6.22 'Noise Sensitive Rooms' are defined as bedrooms and living rooms with the likes of kitchens and bathrooms defined as 'Less Sensitive.' The overheating guidance values are derived from AVOG and AD-O and is a reasonable target during brief overheating periods.

Table 6.3: Mechanical System Noise Limits

Area	Typical Conditions Limit ^(a) L _{Aeq, T} dB	Overheating Conditions Guidance Value ^(b) L _{Aeq, T} dB
Noise Sensitive Rooms	30	30 (±5)
Less Sensitive Rooms	45	35 (±5)
^(a) Taken from section 1.7 of Approved Document F ¹³ , Volume 1, 2021 Edition.		
^(b) Taken from AVOG.		

¹² Design Methodology for the Assessment of Overheating Risk in Homes, TM59:2017.

¹³ The Building Regulations 2010, Ventilation, Approved Document 'F'.

7.0 COMMERCIAL ASSESSMENT

- 7.1 An assessment in accordance with BS 4142 has been conducted for the most exposed plots to the Hinckley & Bosworth Community Hospital.
- 7.2 BS 4142's character corrections are flexible according to whether the acoustic character is just perceptible at the noise receptor, or is clearly perceptible or highly perceptible, and range from 0 to 6 dB for tonal noise, 3 to 9 dB for impulsive noise, and 3 dB for other non-tonal/impulsive acoustic characteristics.
- 7.3 Noise from the extracts was not particularly tonal, or impulsive, and they were only faintly distinguishable from the road traffic noise. Therefore, no acoustic character corrections have been applied. However, due to the intermittent nature of the loading/unloading operations within the storage area, a character correction of +3 dB has been applied in accordance with BS 4142.

Initial Numerical Impact Assessment

- 7.4 The Initial Numerical Impact Assessments (INIA) for Plot 315 is presented in Table 7.1.

Table 7.1: Initial Numerical Impact Assessment

Assessment Step	Plot 315	
	Daytime (Front Elevation)	Night-time
Modelled Specific Sound Level [A]	35 dB $L_{Aeq,1hr}$	36 dB $L_{Aeq,15min}$
Acoustic Character Correction [B]	+3 dB	+3 dB
Rating Level [C = A + B]	38 dB $L_{Ar,1hr}$	39 dB $L_{Ar,15min}$
Background Sound Level [D]	39 dB $L_{A90,1hr}$	30 dB $L_{A90,15min}$
Rating over Background [E = C – D]	-1 dB	+9 dB
Estimation of Impact ^(a)	Low	Adverse
^(a) Impact dependent upon context and other pertinent factors.		

- 7.5 During the daytime, the Rating Level due to the extracts and loading/unloading operations within the storage area of the Hospital, lies below the background sound level. Therefore, the overall conclusion in accordance with BS 4142 is that *“Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context”*.
- 7.6 During the night-time, the Rating Level due to the extracts and loading/unloading operations within the storage area of the Hospital, exceeds the background sound level by up to +9 dB. Therefore, the overall conclusion in accordance with BS 4142 is that this is likely an indication of an Adverse impact, depending on context.

Context

- 7.7 Context is an important factor in determining the BS 4142 impact upon existing receptors. BS 4142 states “... to fully understand the context in which the sound from an industrial and/or commercial source(s) is being assessed, describe and report the sources of sound which comprise the acoustic environment.”. BS 4142 goes on to state “...The significance of sound of an industrial and/or commercial nature depends upon both margin by which the rating level of the specific sound source exceeds the background sound level, and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the context in which the sound occurs/will occur. When making assessment and arriving at decisions, therefore, it is essential to place the sound in context”.
- 7.8 Consideration should therefore be given to the overall context of the planning application, general environment around the Site as well as other aspects of the design.
- 7.9 Contextual considerations for external conditions and internal impacts are now considered separately within the following subsections:

External Amenity Areas

- 7.10 Sound levels from the BS 4142 assessment have been derived at the front elevation of Plot 315; however, it is recognised that occupants are unlikely to be present in this area for extended periods, as residents will typically be indoors or using garden areas to the rear of dwellings. When façade attenuation provided by buildings and screening from garden fencing is taken into account, the resulting external amenity levels are expected to be lower than those presented in Table 7.1.

Night-time Sound Levels

- 7.11 The night-time assessment has been undertaken using predicted external sound levels at the façades of the nearest proposed dwellings, in accordance with the methodology set out in BS 4142. However, it is noted that occupants are most likely to be indoors during night-time hours, and as such the façade insulation would provide a substantial reduction in internal sound levels. Consequently, the sound levels experienced internally would be substantially lower than those predicted externally, further reducing the likelihood of sleep disturbance or adverse effects.

Receptor Design and Cumulative Noise Mitigation

- 7.12 In considering the introduction of new receptors in proximity to existing noise sources, BS 4142 recognises that appropriate design and mitigation measures may be required to ensure an acceptable internal acoustic environment. In this instance, any mitigation incorporated to address road traffic noise, such as the glazing and ventilation specifications, would also provide a level of attenuation to noise arising from commercial activities at the Site. As a result, measures intended to mitigate the dominant road traffic noise source would also mitigate hospital-related noise, further reducing the potential for adverse impact at the proposed dwellings.

Summary

- 7.13 BS 4142 advises that the significance of noise impact should not be determined solely by numerical comparison between rating and background sound levels but should be informed by professional judgement taking account of sound character, duration, frequency, and context. In this instance, although the calculated noise levels exceed the background sound level during the night-time period, the façade-based assessment methodology, together with the overarching road traffic mitigation strategy, is expected to substantially reduce the influence of commercial noise. As such, an 'Adverse' impact is considered unlikely.

8.0 MITIGATION

External Sound Levels

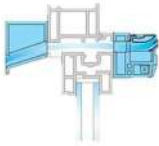
- 8.1 The Site generally follows good acoustic design principles with dwellings facing the nearest respective roads and gardens used for amenity purposes located behind. With the current layout in situ, BS 8233's criterion of 55 dB $L_{Aeq, 16hr}$ will be satisfied for the vast majority of garden locations on the Site without the need for additional mitigation.
- 8.2 For those most exposed gardens which have a clear line of sight to Normandy Way (Plots 448 and 478) it has been shown that the 55 dB criterion can be achieved with the provision of increased garden fencing of up to 2m for Plot 448, and 2.2m for Plot 478.
- 8.3 The locations of the increased fence heights are illustrated in drawing 28420_04_120_13 in **Appendix D**.
- 8.4 Where increased fence heights are proposed, the following specifications are recommended as a minimum:
- Good quality timber with no warping, knots etc;
 - At least 25mm thick in all places;
 - Close-boarder and continued across the front of posts to minimise gaps;
 - Boards should overlap 25mm as a minimum;
 - No gaps should be present between gravel board and the ground; and
 - Minimum mass of 10 to 15kg/m².

Internal Sound Levels

- 8.5 Acoustic modelling has demonstrated potential façade sound levels and, in accordance with BS 8233, ProPG and AVOG, sound reduction performance requirements of the façade have been determined. To ensure a robust approach, both the road traffic noise and commercial noise have been accounted for when determining the required glazing and ventilation.
- 8.6 In terms of acoustics, windows and ventilation strategies are the 'weakest' acoustic point in any façade and subsequently, the composite sound reduction performance is typically dominated by these elements. Therefore, minimum performance requirements to be provided by the glazing and ventilation elements at all dwellings are presented herein.
- 8.7 Drawing on the above, Table 8.1 provides the reduction requirements and indicative glazing and ventilation solutions across the Site in order to demonstrate compliance with the internal sound level criteria outlined in BS 8233 and ProPG during typical conditions; internal sound level criteria outlined in AVOG during overheating conditions; whilst adhering to the ventilation requirements of AD-F.
- 8.8 This table should be read in conjunction with the drawings in **Appendix G** whereby drawing 28420_04_120_18 demonstrates the required reduction for bedrooms and drawing 28420_04_120_19 demonstrates the required reduction for all other habitable rooms.

8.9 For each reference in Table 8.1, the sound reduction performance requirements, in octave band and weighted reduction format, are presented in **Appendix H**.

Table 8.1: Suggested Internal Mitigation Measures

Mitigation Ref.	Glazing Solution	Whole-Dwelling Ventilation Solution ^(a)	Overheating Ventilation Solution ^(b)
Ref. A-1	<u>Indicative Solution</u> 4mm glass panel 12mm air gap 4mm glass panel	<u>Standard Trickle Vent</u> Direct airpath trickle vent located in the top of the window frame 	<u>No Overheating Mitigation Required.</u> Opening windows can be used to combat overheating and provide purge ventilation.
Ref. A-2	Req. 27 dB $R_w + C_{tr}$	Req. $D_{n,e,w} + C_{tr} = 32$ dB	
Ref. B	<u>Indicative Solution</u> 8mm pane 12mm air space 10mm pane Req. $R_w + C_{tr} = 33$ dB	<u>Acoustically Rated Trickle Vent</u> Trickle vent with torturous airpath located in the top of the window frame  Req. $D_{n,e,w} + C_{tr} = 36$ dB	<u>MV System</u> Mechanical Ventilation Systems to provide room specific, or whole dwelling, extract and purge ventilation. 
Ref. C	<u>Indicative Solution</u> 6mm pane 18mm air space 9.5 mm laminated pane Req. $R_w + C_{tr} = 36$ dB	<u>Acoustically Rated Through Wall Trickle Vent</u> Through wall trickle vent with torturous airpath.  Req. $D_{n,e,w} + C_{tr} = 42$ dB	
^(a) If a whole dwelling MVHR system is to be installed, this would negate the need to install whole dwelling ventilation solutions for typical conditions (window mounted trickle vents). ^(b) Indicative overheating solution – subject to change at Building Control stage based upon the outcome of any Dynamic Thermal Modelling undertaken to satisfy the requirements of AD-O.			

9.0 CONCLUSIONS

9.1 MEC has been commissioned by Miller Homes, to undertake an Acoustic Assessment for a proposed residential development on Land off Ashby Road and Normandy Way, Hinckley.

9.2 Assessment has been undertaken in accordance with BS 4142, with consideration given to the guidance contained in BS 8233, ProPG and AVOG.

Road Traffic Assessment

9.3 Detailed assessments of the Site, during typical conditions, have been undertaken in accordance with BS 8233 and ProPG criteria whilst giving consideration to typical condition ventilation requirements in AD-F.

External Sound Levels

9.4 The acoustic modelling has demonstrated that the BS 8233 lower-level criterion of 50 dB $L_{Aeq,16hour}$ will be met for the vast majority of gardens across the Site, without requiring further mitigation. In instances where gardens maintain a line of sight to Normandy Way, compliance with the external amenity criteria can be achieved by increased fence heights of up to 2m and 2.2m with minimum specifications as outlined in Paragraph 8.4.

Internal Sound Levels

9.5 Embedded façade mitigation measures have been suggested in order to achieve internal noise level criteria in line with BS 8233 and ProPG. Calculations demonstrate that the vast majority of the Site can satisfy the internal acoustic criterion through the provision of standard thermal double glazing and standard window mounted trickle ventilators.

9.6 However, it has been determined that for the most exposed dwellings, uprated glazing and acoustically rated through wall vents will be required.

Overheating Considerations

9.7 During periods of overheating, alternative ventilation solutions have been explored. Calculations demonstrate that the relevant internal acoustic criteria can be achieved with the provision of room specific mechanical ventilation systems.

9.8 However, any overheating mitigation measures presented within this report are presented to satisfy internal acoustic conditions only. The exact ventilation requirements to combat overheating will need to be considered during the Building Control process of the Site. Nevertheless, matters relating to noise in respects of Environmental Health have been fully considered within this report.

Commercial Assessment

9.9 With regards to external noise levels associated with Hinckley & Bosworth Community Hospital, a BS 4142 assessment has been undertaken using sound level data obtained from MEC's survey position at CM3. The predicted daytime rating level at the most exposed plots indicates a 'Low' impact due to commercial sound

levels falling below the background sound level. The night-time assessment suggests an 'Adverse' numerical impact based on external façade levels, but the impact is dependent on contextual factors.

- 9.10 When applying the contextual considerations required by BS 4142, the likelihood of an 'Adverse' impact is greatly reduced. Residents are expected to be indoors during night-time hours, where glazing and ventilation systems would reduce the noise levels to well below the levels associated with disturbance.
- 9.11 Overall, when the nature and operational context of the commercial activity is taken into account alongside the embedded façade mitigation specified for the development, the impact of operations at Hinckley & Bosworth Community Hospital is not expected to give rise to adverse effects at the proposed receptors. The commercial-related noise environment is therefore not considered a constraint to the proposed development.

Summary

- 9.12 In summary, based upon the assessment presented within this report, it is considered that the Site is suitable for development provided the mitigation measures are followed.



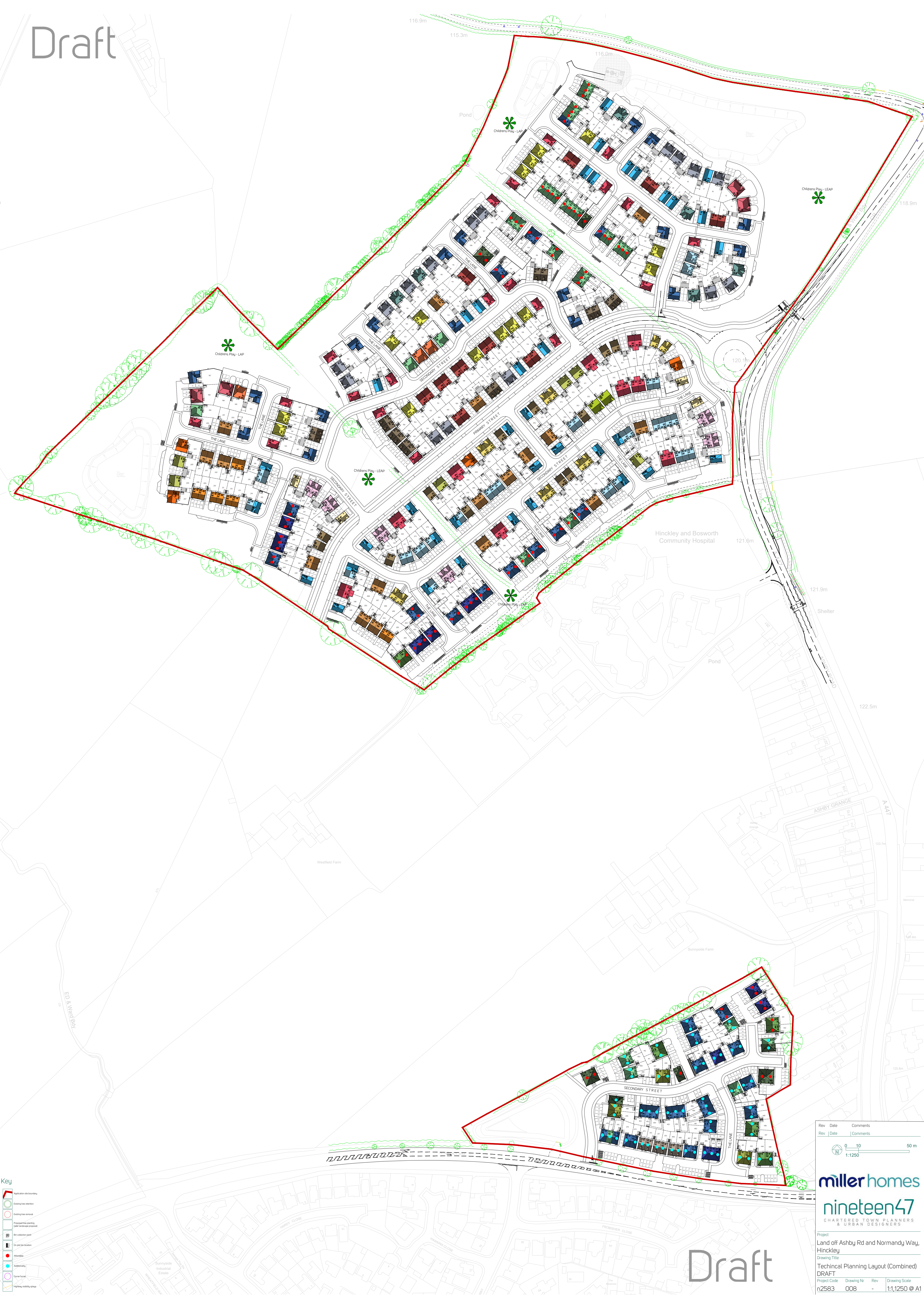
MEC
Consulting Group

APPENDICES

Appendix A



Draft



Key

- Application site boundary
- Existing tree retention
- Existing tree removal
- Proposed tree planting (over 100mm dbh)
- On plot parking
- On plot parking
- Accessibility
- Additional
- Corner fence
- Highway visibility triangle

Rev	Date	Comments

0 10 50 m
1:1250

miller homes
nineteen47
CHARTERED TOWN PLANNERS & URBAN DESIGNERS

Project
Land off Ashby Rd and Normandy Way, Hinckley

Drawing Title
DRAFT

Technical Planning Layout (Combined)

Project Code	Drawing Nr	Rev	Drawing Scale
n2583	008	-	1:1,250 @ A1

Draft



MEC
Consulting Group

APPENDICES

Appendix B



GLOSSARY OF TECHNICAL TERMS

Noise

Noise is defined as unwanted sound. Human ears are able to respond to sound in the frequency range 20 Hz (deep bass) to 20,000 Hz (high treble) and over the audible range of 0 dB (the threshold of perception) to 140 dB (the threshold of pain). The ear does not respond equally to different frequencies of the same magnitude, but is more responsive to mid-frequencies than to lower or higher frequencies. To quantify noise in a manner that approximates the response of the human ear, a weighting mechanism is used. This reduces the importance of lower and higher frequencies, in a similar manner to the human ear.

Furthermore, the perception of noise may be determined by a number of other factors, which may not necessarily be acoustic. In general, the impact of noise depends upon its level, the margin by which it exceeds the background level, its character and its variation over a given period of time. In some cases, the time of day and other acoustic features such as tonality or impulsiveness may be important, as may the disposition of the affected individual. Any assessment of noise should give due consideration to all of these factors when assessing the significance of a noise source.

The most widely used weighting mechanism that best corresponds to the response of the human ear is the 'A'-weighting scale. This is widely used for environmental noise measurements, and the levels are denoted as dB(A) or L_{Aeq} , L_{A90} etc., according to the parameter being measured.

The decibel scale is logarithmic rather than linear, and hence a 3 dB increase in sound level represents a doubling of the sound energy present. Judgement of sound is subjective, but as a general guide a 10 dB(A) increase can be taken to represent a doubling of loudness, whilst an increase in the order of 3 dB(A) is generally regarded as the minimum difference needed to perceive a change under normal listening conditions.

Typical sound levels found in the environment

Sound Level	Location
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a car
60 to 70 dB(A)	Typical high street
70 to 90 dB(A)	Inside a factory
100 to 110 dB(A)	Burglar alarm at 1m away
110 to 130 dB(A)	Jet aircraft taking off
140 dB(A)	Threshold of pain

Descriptor	Terminology
Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of $20\mu\text{Pa}$ (20×10^{-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 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 $20\mu\text{Pa}$.
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.
$L_{AFmax, T}$	A noise level index defined as the maximum noise level during the measurement period. L_{Max} is sometimes used for the assessment of discrete loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. It is typically 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.
$L_{10, T}$	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.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade	At a distance of 1m in front of a large sound reflecting object such as a building facade.
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	A range of frequencies whose upper limit is twice the frequency of the lower limit
One-third Octave Band	A frequency band in which the upper limit is $2^{1/3}$ times the frequency of the lower limit.
Rating Level	The specific sound level, plus any adjustment for characteristic feature of sound in BS 4142.
Specific Sound Level	The A-weighted L_{eq} sound level produced by a sound source during a specified period of time. Commonly known as the sound source under investigation as defined in BS 4142.
Typical Maximum Level	The 90 th percentile maximum event level (L_{AFmax}) measured during a period. Used for assessing night-time maximum levels under typical and overheating conditions.



MEC
Consulting Group

APPENDICES

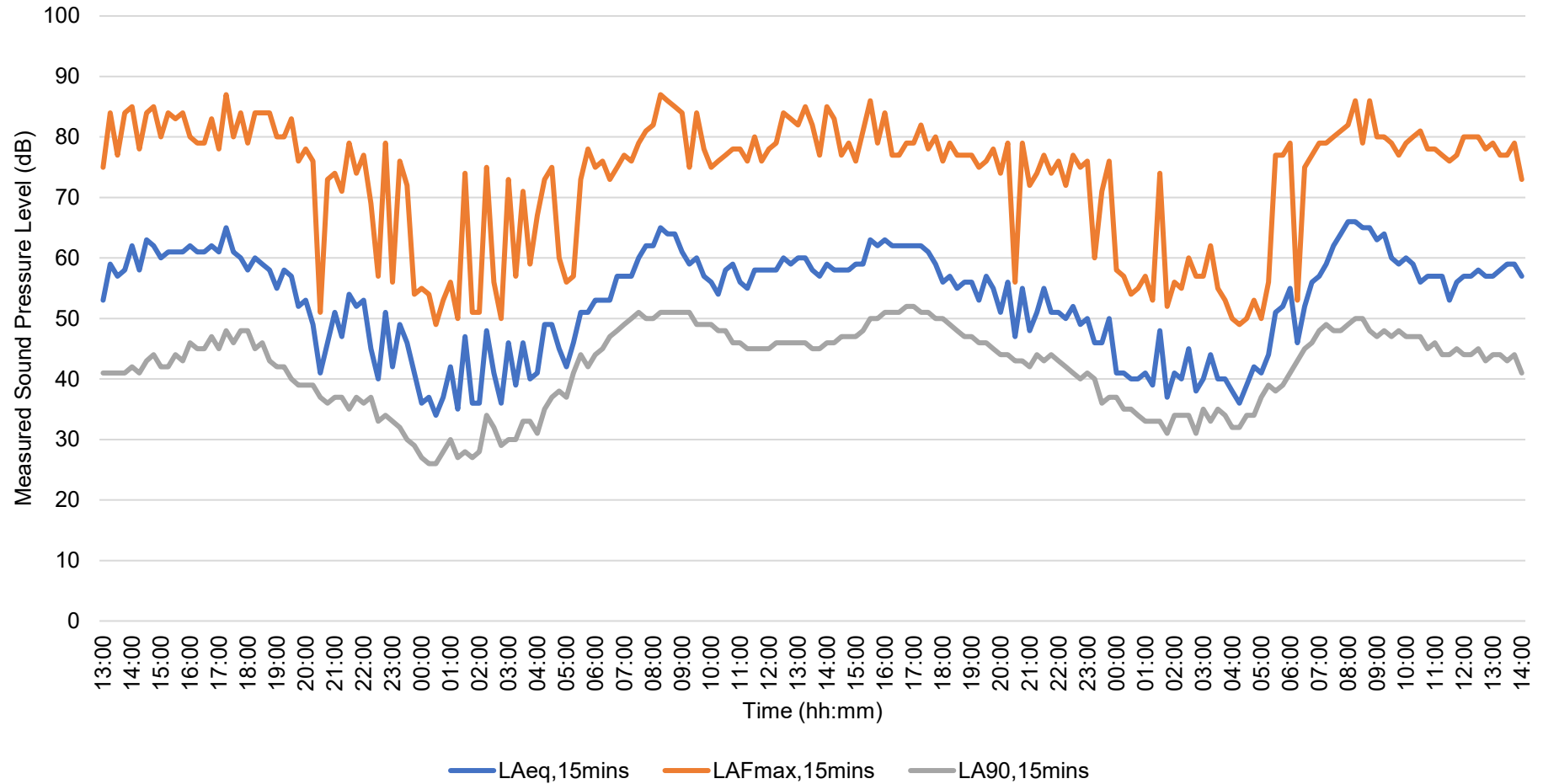
Appendix C



Land off Ashby Road and Normandy Way, Hinckley - CM1

Environmental Sound Monitoring Survey Results

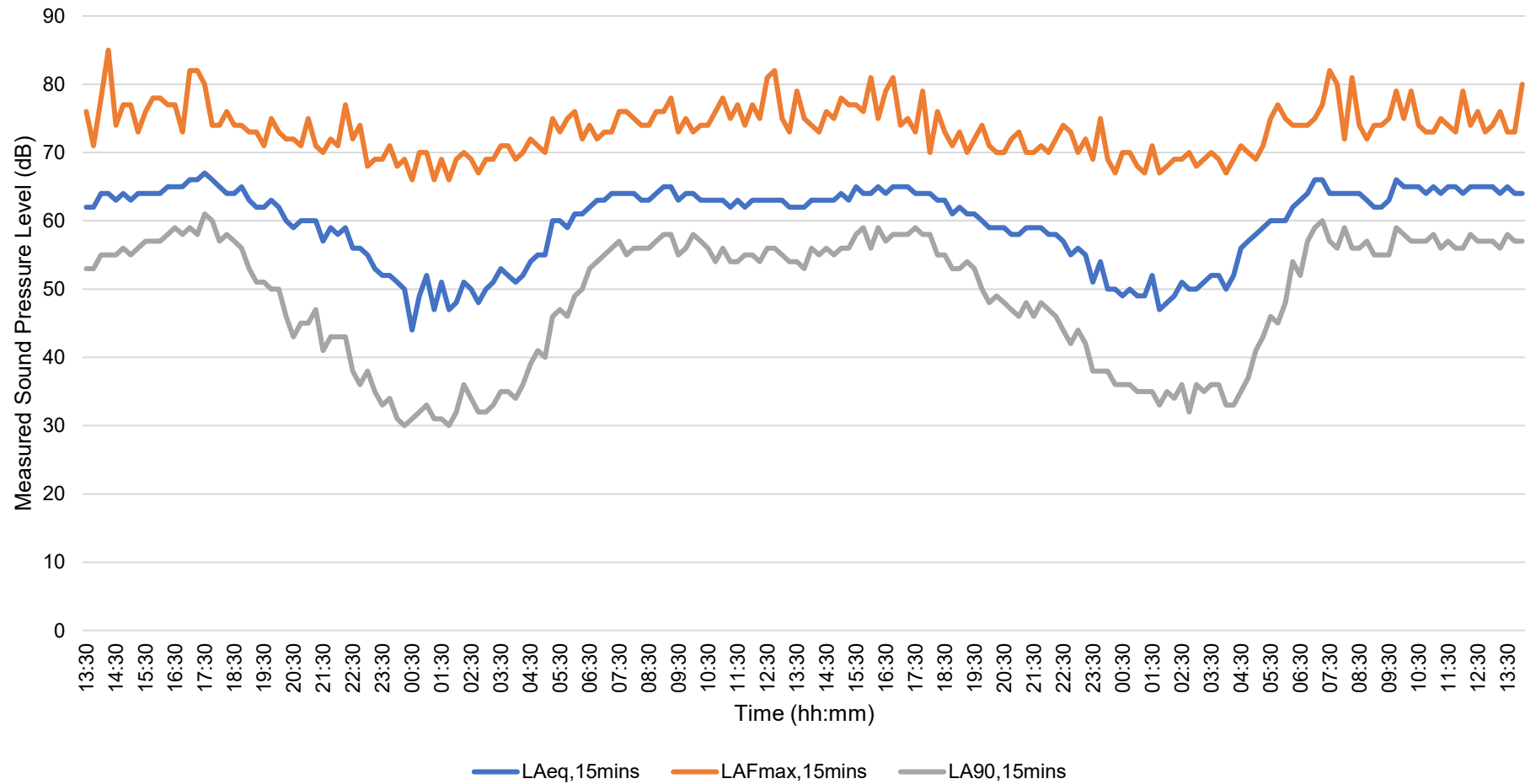
$L_{Aeq,15mins}$, $L_{AFmax,15mins}$ & $L_{A90,15mins}$ Measured Sound Levels 15th - 17th January 2024



Land off Ashby Road and Normandy Way, Hinckley - CM2

Environmental Sound Monitoring Survey Results

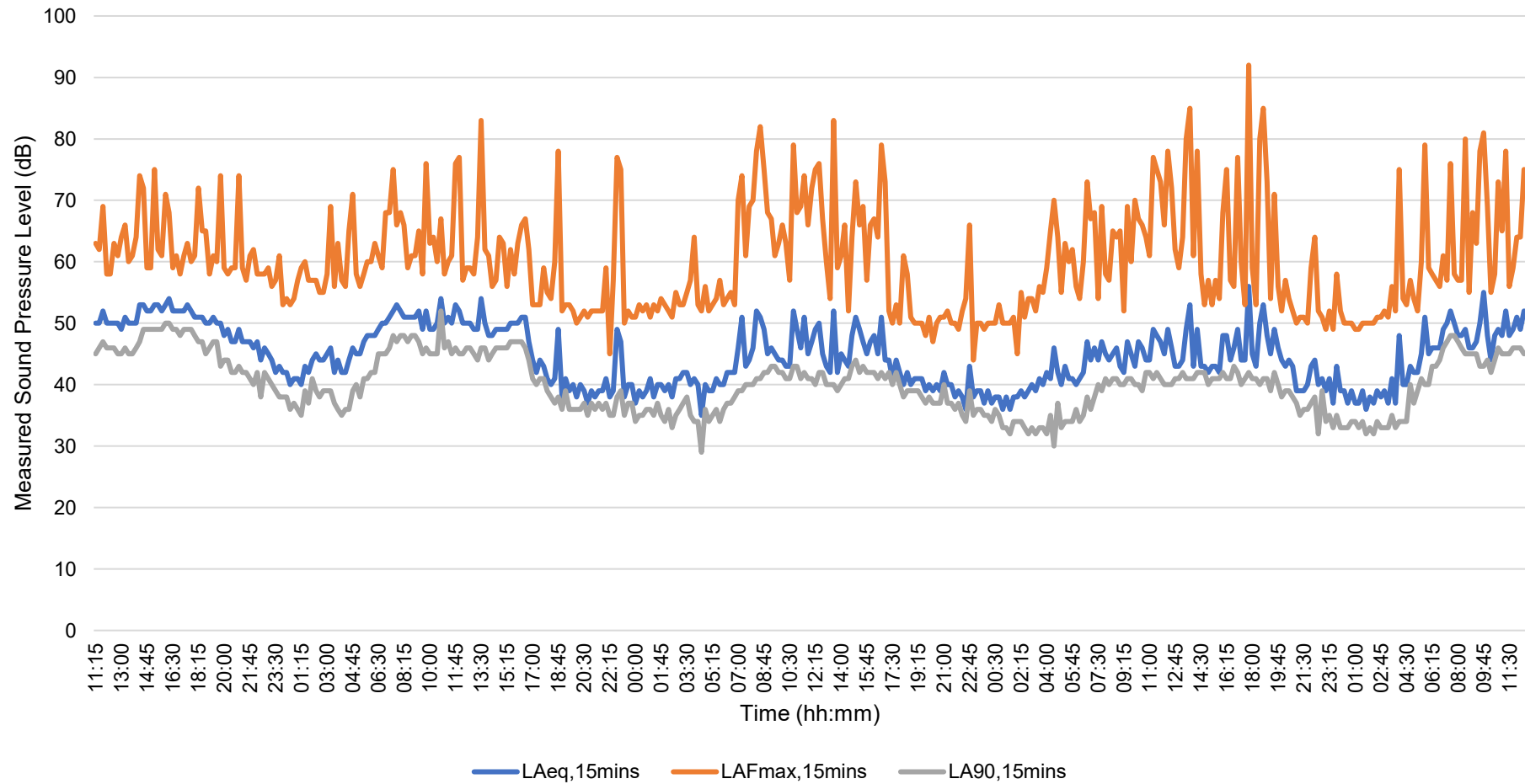
$L_{Aeq,15mins}$, $L_{AFmax,15mins}$ & $L_{A90,15mins}$ Measured Sound Levels 15th - 17th January 2024



Land off Ashby Road and Normandy Way, Hinckley - CM3

Environmental Sound Monitoring Survey Results

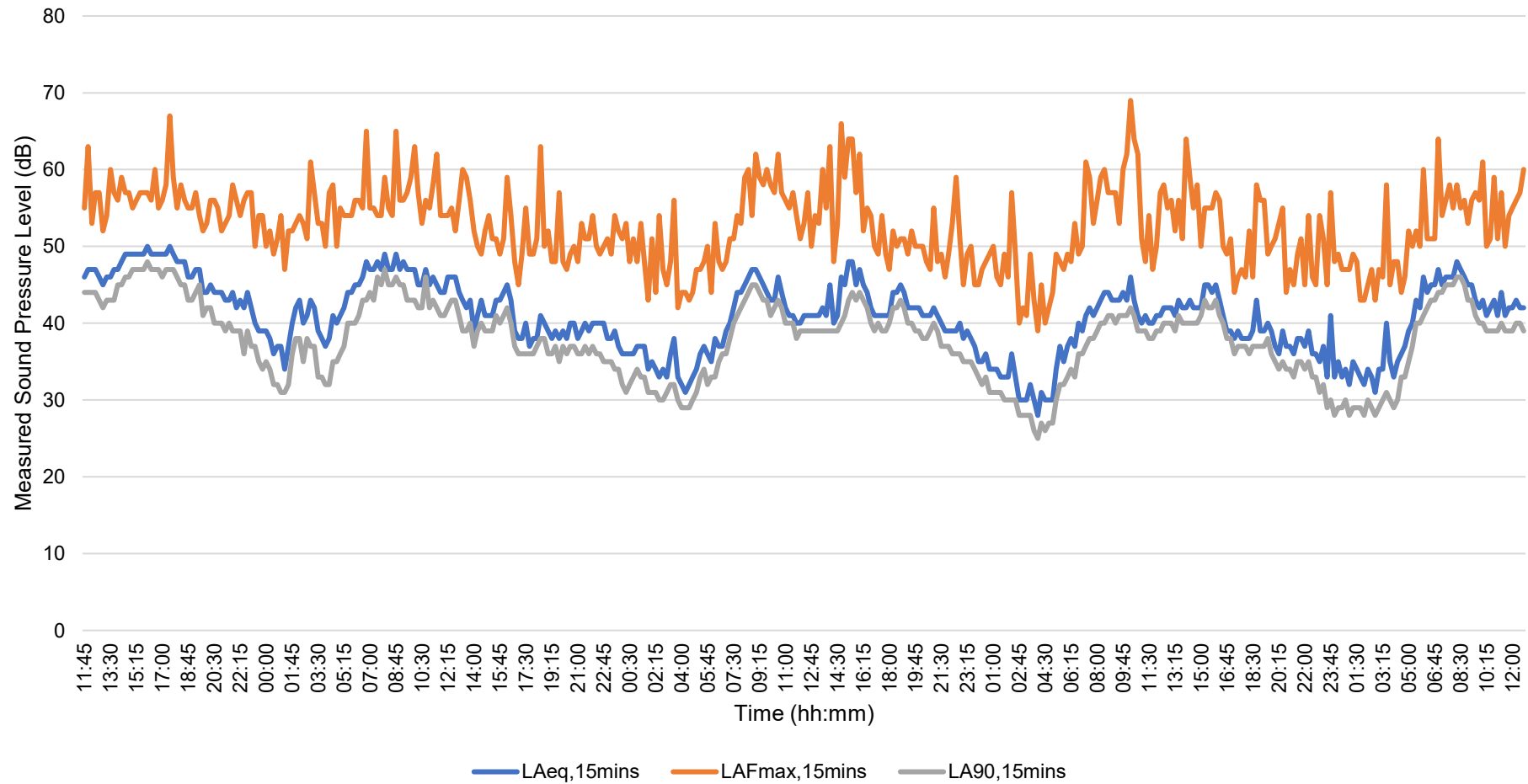
$L_{Aeq,15mins}$, $L_{AFmax,15mins}$ & $L_{A90,15mins}$ Measured Sound Levels 11th - 15th January 2024



Land off Ashby Road and Normandy Way, Hinckley - CM4

Environmental Sound Monitoring Survey Results

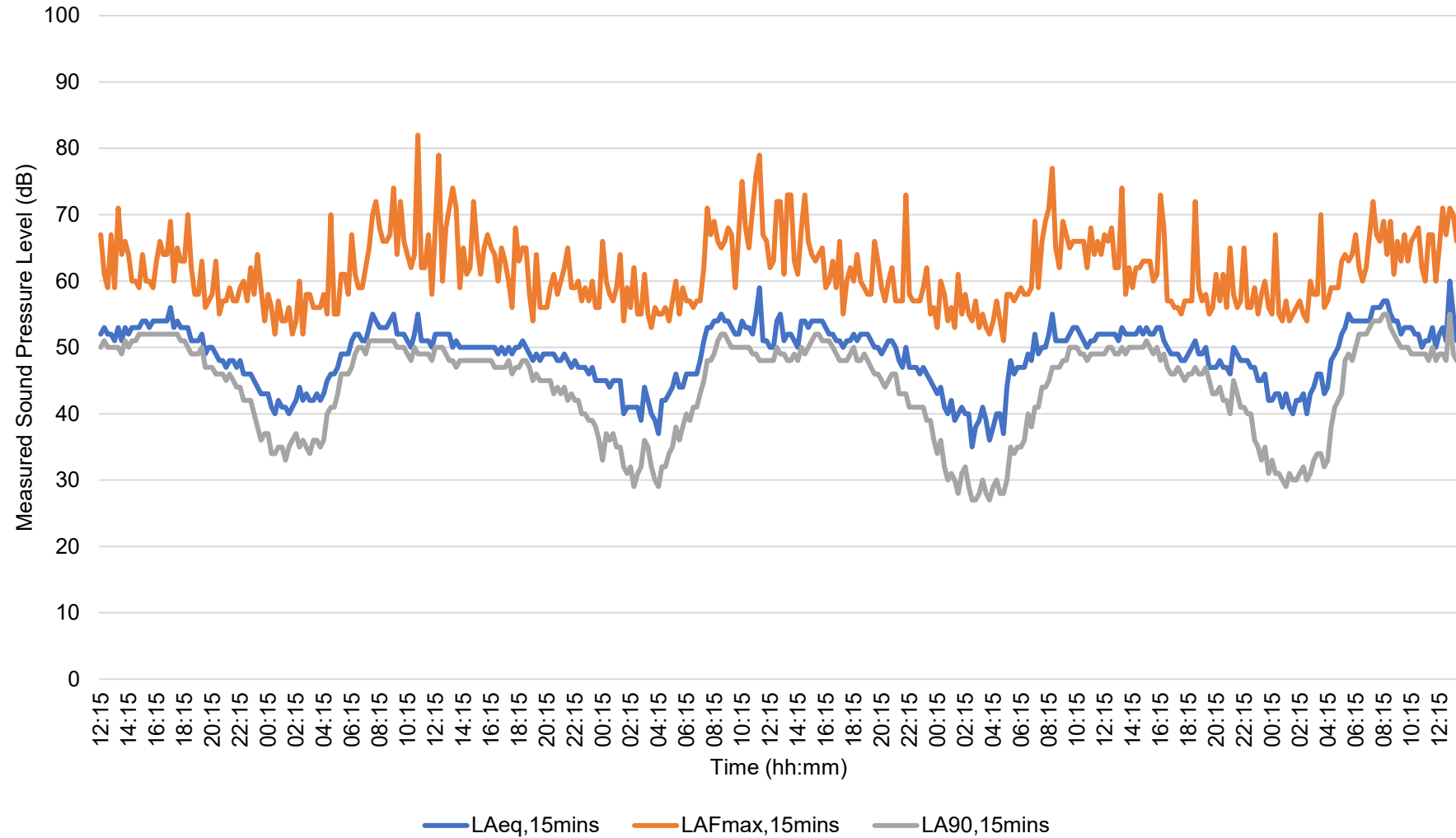
$L_{Aeq,15mins}$, $L_{AFmax,15mins}$ & $L_{A90,15mins}$ Measured Sound Levels 11th - 15th January 2024



Land off Ashby Road and Normandy Way, Hinckley - CM5

Environmental Sound Monitoring Survey Results

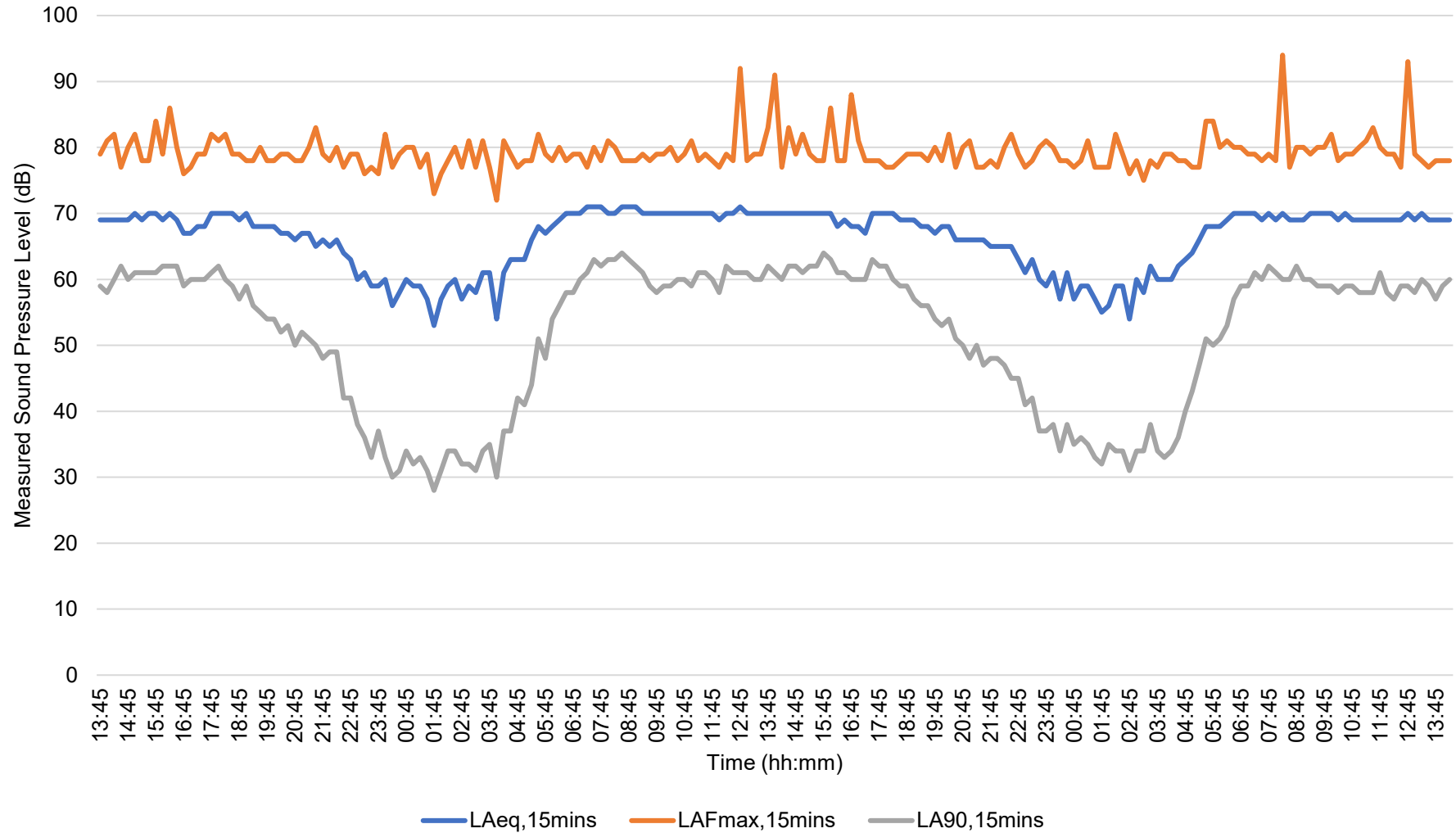
$L_{Aeq,15mins}$, $L_{AFmax,15mins}$ & $L_{A90,15mins}$ Measured Sound Levels 11th - 15th January 2024



Land off Ashby Road and Normandy Way, Hinckley - CM6

Environmental Sound Monitoring Survey Results

$L_{Aeq,15mins}$, $L_{AFmax,15mins}$ & $L_{A90,15mins}$ Measured Sound Levels 15th - 17th January 2024





MEC
Consulting Group

APPENDICES

Appendix D





NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

0–50dB(A)

50–55dB(A)

55–60dB(A)

60–65dB(A)

65–70dB(A)

70–75dB(A)

75–80dB(A)

>80dB(A)

2m Garden Fencing

2.2m Garden Fencing



NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

	0-50dB(A)
	50-55dB(A)
	55-60dB(A)
	60-65dB(A)
	65-70dB(A)
	70-75dB(A)
	75-80dB(A)
	>80dB(A)

REV.	AMENDMENTS:	EW	HJ	NF	15.04.26
		DRN:	CHK:	APP:	DATE:
PROJECT: LAND OFF ASHBY ROAD AND NORMANDY WAY, HINCKLEY					
DRAWING TITLE: NIGHT-TIME AMBIENT SOUND LEVELS Laeq,8hour					
CLIENT: MILLER HOMES LTD					
DRAWING NUMBER: 28420_04_120_14					
REVISION: -	SHEET SIZE: A3	SCALE: NFS			
STATUS: FOR INFORMATION / APPROVAL					
 Birmingham Brighton Leicester		Telephone: 01530 264 753 Email: group@m-ec.co.uk Website: www.m-ec.co.uk ORDNANCE SURVEY © CROWN COPYRIGHT 2015. ALL RIGHTS RESERVED. LICENCE NUMBER 100055865.			



NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

	0–50dB(A)
	50–55dB(A)
	55–60dB(A)
	60–65dB(A)
	65–70dB(A)
	70–75dB(A)
	75–80dB(A)
	>80dB(A)

REV:	AMENDMENTS:	EW	HJ	NF	15.04.20
		DRN:	CHK:	APP:	DATE:
PROJECT: LAND OFF ASHBY ROAD AND NORMANDY WAY, HINCKLEY					
DRAWING TITLE: NIGHT-TIME MAXIMUM SOUND LEVELS LAFmax,T					
CLIENT: MILLER HOMES LTD					
DRAWING NUMBER: 28420_04_120_15					
REVISION: -	SHEET SIZE: A3		SCALE: NFS		
STATUS: FOR INFORMATION / APPROVAL					
			Telephone: 01530 264 753 Email: group@m-ec.co.uk Website: www.m-ec.co.uk ORDNANCE SURVEY © CROWN COPYRIGHT 2015. ALL RIGHTS RESERVED. LICENCE NUMBER 100055865.		

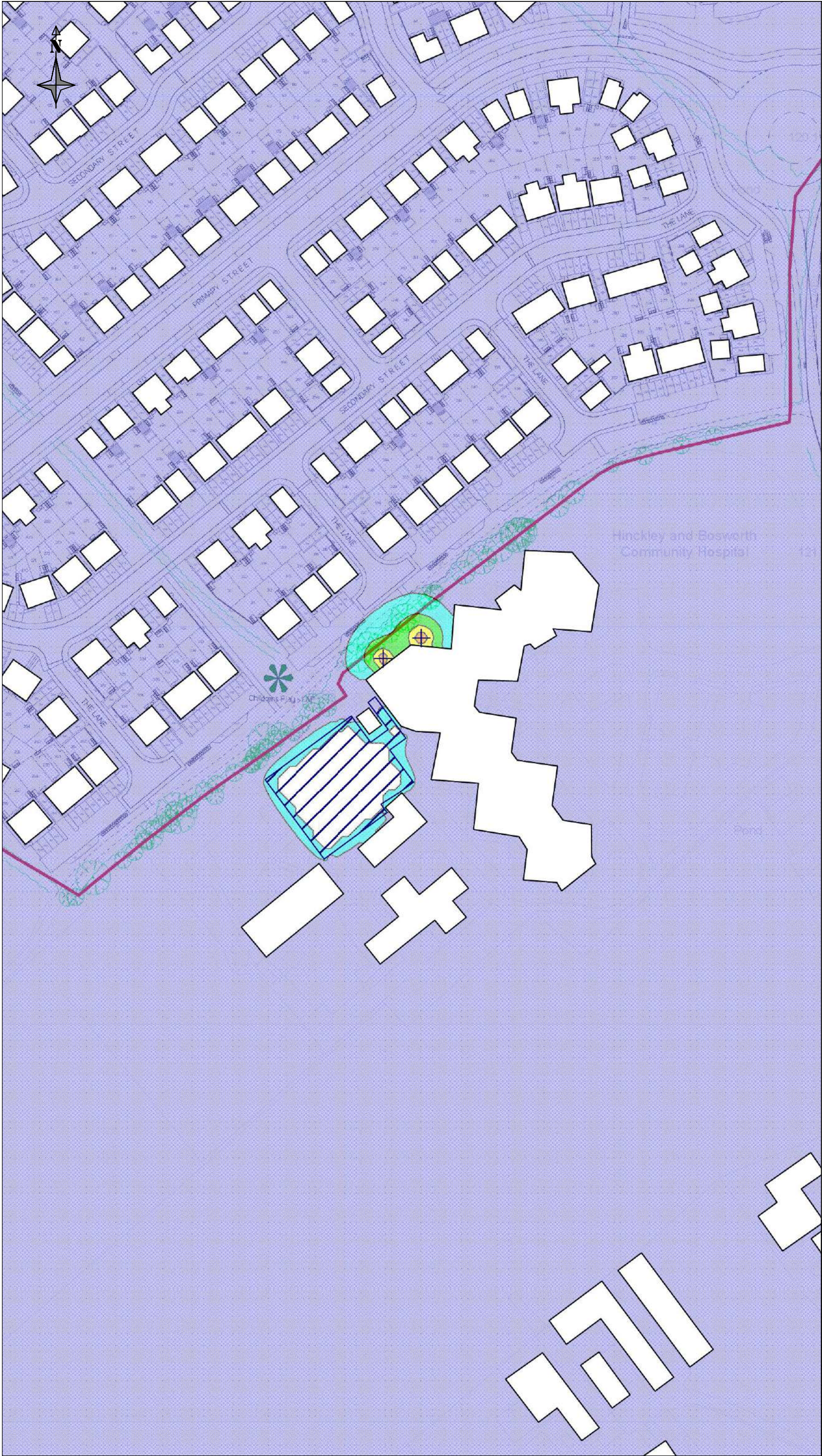


MEC
Consulting Group

APPENDICES

Appendix E





NOTES:
1. DO NOT SCALE THIS DRAWING.

KEY

0–40dB(A)

40–45dB(A)

45–50dB(A)

50–55dB(A)

55–60dB(A)

>60dB(A)

Area Source

Point Source

REV:	AMENDMENTS:	EW	HJ	NF	15.04.20
		DRN	CHK	APP	DATE

PROJECT: LAND OFF ASHBY ROAD AND NORMANDY WAY, HINCKLEY

DRAWING TITLE: DAYTIME SOUND PRESSURE LEVELS FOR BS 4142 ASSESSMENT, LAeq,1hour

CLIENT: MILLER HOMES LTD

DRAWING NUMBER: 28420_04_120_16

REVISION: - SHEET SIZE: A3 SCALE: NFS

STATUS: FOR INFORMATION / APPROVAL

MEC
Consulting Group
Birmingham | Brighton | Leicester

Telephone: 01530 264 753
Email: group@m-ec.co.uk
Website: www.m-ec.co.uk

ORDNANCE SURVEY © CROWN
COPYRIGHT 2015. ALL RIGHTS
RESERVED. LICENCE NUMBER
100055865.



NOTES:

1. DO NOT SCALE THIS DRAWING.

KEY

	0–40dB(A)
	40–45dB(A)
	45–50dB(A)
	50–55dB(A)
	55–60dB(A)
	>60dB(A)

	Area Source
	Point Source

REV:	AMENDMENTS:	EW	HJ	NF	15/04/20
		DRN	CHK	APP	DATE

PROJECT: LAND OFF ASHBY ROAD AND NORMANDY WAY, HINCKLEY

DRAWING TITLE: NIGHT-TIME SOUND PRESSURE LEVELS FOR BS 4142 ASSESSMENT, LAeq,15min

CLIENT: MILLER HOMES LTD

DRAWING NUMBER: 28420_04_120_17

REVISION: -	SHEET SIZE: A3	SCALE: NFS
-------------	----------------	------------

STATUS: FOR INFORMATION / APPROVAL

MEC
Consulting Group
Birmingham | Brighton | Leicester

Telephone: 01530 264 753
Email: group@m-ec.co.uk
Website: www.m-ec.co.uk

ORDNANCE SURVEY © CROWN
COPYRIGHT 2015. ALL RIGHTS
RESERVED. LICENCE NUMBER
100055865.



MEC
Consulting Group

APPENDICES

Appendix F



Question	Answer	Points
#1 Where is the scheme in the UK?	Rest of England and Wales	2
#2 Is the site likely to see an Urban Heat Island effect?	No	0
#3 Does the site have barriers to windows opening?	Day	4
	Night	8
#4 Are the dwellings flats?	No	0
#5 Does the scheme have community heating?	No	0
#6 What is the estimated average glazing ratio for the dwellings	>35%	4
#7 Are the dwellings single aspect?	No	0
#8 Do the site surroundings feature significant blue/green infrastructure?	Yes	-1
#9 Are immediate surrounding surfaces in majority pale in colour, or blue green?	No	0
#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas?	No	0
#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation?	No	0
#12 Do floor-to-ceiling heights allow for ceiling fans now, or in the future?	No	0
#13 Is there useful external shading?	N0	0
#14 Do windows & opening support effective ventilation?	Part F Only	0
Total		17
Overheating Risk		High
(a) Aside from the most exposed dwellings, all windows can be opened during the day and still achieve good acoustic conditions internally in accordance with BS 8233. (b) Calculations have been undertaken for select, most exposed plots to determine the average glazing ratio for the development.		



MEC
Consulting Group

APPENDICES

Appendix G





NOTES:

1. DO NOT SCALE THIS DRAWING.
2. Please refer to report reference 28420-ENV-0404 for the details on the proposed glazing and ventilation references.

KEY

Ref. A-1

Ref. A-2

Ref. B

Ref. C

REV:	AMENDMENTS:	EW	HJ	NF	15.04.20
		DRN	CHK	APP	DATE
PROJECT: LAND OFF ASHBY ROAD AND NORMANDY WAY, HINCKLEY					
DRAWING TITLE: MITIGATION REFERENCE FOR HABITABLE BEDROOMS					
CLIENT: MILLER HOMES LTD					
DRAWING NUMBER: 28420_04_120_18					
REVISION:	-	SHEET SIZE:	A3	SCALE:	NFS
STATUS: FOR INFORMATION / APPROVAL					
MEC Consulting Group Birmingham Brighton Leicester				Telephone: 01530 264 753 Email: group@m-ec.co.uk Website: www.m-ec.co.uk ORDNANCE SURVEY © CROWN COPYRIGHT 2015. ALL RIGHTS RESERVED. LICENCE NUMBER 100055865.	



NOTES:

1. DO NOT SCALE THIS DRAWING.
2. Please refer to report reference 28420-ENV-0404 for the details on the proposed glazing and ventilation references.

KEY

Ref. A-1

Ref. A-2

Ref. B

Ref. C

REV.	AMENDMENTS:	EW	HJ	NF	15.04.20
		DRN	CHK	APP	DATE

PROJECT: LAND OFF ASHBY ROAD AND NORMANDY WAY, HINCKLEY

DRAWING TITLE: MITIGATION REFERENCE FOR ALL OTHER HABITABLE ROOMS (NON-BEDROOMS)

CLIENT: MILLER HOMES LTD

DRAWING NUMBER: 28420_04_120_19

REVISION: -	SHEET SIZE: A3	SCALE: NFS
-------------	----------------	------------

STATUS: FOR INFORMATION / APPROVAL

MEC
Consulting Group
Birmingham | Brighton | Leicester

Telephone: 01530 264 753
Email: group@m-ec.co.uk
Website: www.m-ec.co.uk

ORDNANCE SURVEY © CROWN
COPYRIGHT 2015. ALL RIGHTS
RESERVED. LICENCE NUMBER
100055865.



MEC
Consulting Group

APPENDICES

Appendix H



Reference A-1 & A-2 Performance Requirements

Façade Element	Sound Insulation Performance Requirements (dB) in Octave Band Centre Frequencies (Hz)						$R_w / D_{n,e,w}$ (dB)	C_{tr} (dB)
	125	250	500	1k	2k	4k		
Glazing	22	20	26	36	39	31	31	-4
Ventilation and Overheating	32	32	31	33	31	31	32	0
The glazing reduction requirements can typically be found in a configuration of 4/12/4, where the information is presented in terms of the thickness of one pane of glass in mm, followed by the size of the air gap in mm, followed by the thickness of the second pane of glass in mm. The background ventilation requirements can be found in standard window mounted non-acoustic trickle ventilators.								

Reference B Performance Requirements

Façade Element	Sound Insulation Performance Requirements (dB) in Octave Band Centre Frequencies (Hz)						$R_w / D_{n,e,w}$ (dB)	C_{tr} (dB)
	125	250	500	1k	2k	4k		
Glazing	29	27	35	37	36	45	36	-3
Ventilation (Trickle)	39	38	30	46	42	40	39	-3
The reduction requirements can typically be found in 8/12/10 thermal double glazing, acoustically rated window mounted trickle vents for typical conditions.								

Reference C Performance Requirements

Façade Element	Sound Insulation Performance Requirements (dB) in Octave Band Centre Frequencies (Hz)						$R_w / D_{n,e,w}$ (dB)	C_{tr} (dB)
	125	250	500	1k	2k	4k		
Glazing	25	29	40	48	47	56	42	-6
Ventilation (Trickle)	43	37	38	46	57	66	45	-3
The reduction requirements can typically be found in 6/18/9.5 thermal double glazing, acoustically rated through wall trickle vents for typical conditions.								

It is appreciated that it is impractical to achieve every octave band minimum performance requirement, therefore, during procurement of solutions, the $R_w + C_{tr}$ or $D_{n,e,w} + C_{tr}$ should be adhered to at a minimum.



MEC

Consulting Group

Birmingham | Brighton | Leicester | Nottingham

E: group@m-ec.co.uk | **W:** m-ec.co.uk



CIVIL ENGINEERING



TRANSPORT



FLOOD RISK & DRAINAGE



STRUCTURES



GEO-ENVIRONMENTAL



ACOUSTIC AIR



UTILITIES



GEOMATICS



LIGHTING



EXPERT WITNESS