MEC Consulting Group

ACOUSTIC AIR

Chalk Road, Higham
Acoustic and Vibration Assessment
August 2025

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1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Richborough (hereafter referred to as 'the Client'), to undertake an Acoustic and Vibration Assessment for a proposed residential development on Chalk Road, Higham, Rochester (hereafter referred to as 'the Site').

Existing Site

1.2 The Site is approximately 1.56 ha in size, comprising of arable land and farm buildings. The site is bound immediately by Chalk Road to the south arable fields to the west and north and a railway to the east.

1.3 The principal sources of noise and vibration affecting the Site is predicted to be from transportation using the Thameslink railway line and Chalk Road.

1.4 An approximate redline boundary is presented in Figure 1.1 and in **Appendix A**.

Figure 1.1: Approximate Redline Boundary

Development Proposals

1.5 The development proposals comprise;

Outline application for the demolition of existing buildings and erection up to 40 residential dwellings, public open space and associated works. Approval is sought for the principal means of vehicular access from Chalk Road and all other matters are reserved.

1.6 An illustrative development framework plan is provided in **Appendix A**.

Assessment Scope

1.7 The following scope of works has been undertaken:

- An Environmental Sound and Vibration Survey has been undertaken within the Site in order to determine the prevailing conditions;
- Using the measured sound levels, an acoustic model has been calibrated in order to predict sound levels across the Site;
- An assessment has been undertaken against the relevant criteria contained within ProPG[1], the British Standard BS 8233[2] and AVOG[3];
- A vibration assessment has been undertaken in accordance with BS 6472[4]; and
- Where required, appropriate mitigation measures have been provided to demonstrate compliance with the relevant standards.

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

Disclaimer

1.9 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.

1.10 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.

1.11 This document has been prepared using the various documents listed within the body of this report, together with drawings, technical information and additional verbal representations made by third parties. We have not audited nor independently verified the content or accuracy of any of the documents and information provided to us in the preparation of this report.

1.12 If additional information comes to light subsequent to the production of this report, we reserve the right to revise our opinions and the conclusions reached.

[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] BS 6472:1992 *'Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)'*

2.0 STANDARDS AND GUIDANCE

General

2.1 Acoustics and vibration glossaries are 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) 2024;
- 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 Overheating and Ventilation Guide (AVOG) 2020; and
- BS 6472:1992 *'Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)'*.

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

National Planning Policy Framework – NPPF 2024

2.4 The latest National Planning Policy Framework (NPPF), issued by the Ministry of Housing, Communities and Local Government in 2024, sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is to be a material consideration in planning decisions.

2.5 Paragraph 187 of the NPPF advises that, with respect to noise, planning policies and decisions should contribute to and enhance the natural and local environment by *"...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution..."*.

2.6 Further, paragraph 198 advises that "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life; and

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

2.7 The NPPF's footnote to point a) above explicitly refers to the Explanatory Note to the *Noise Policy Statement for England* (Department for Environment, Food & Rural Affairs, 2010).

Noise Policy Statement for England – NPSE 2010

2.8 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.

2.9 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) 2017

2.10 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.

2.11 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 4142 should be conducted.

2.12 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.

2.13 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_{AFmax} more than 10 – 15 times per night. ProPG indicates that individual noise events do not exceed 45 dB L_{AFmax} more than 10 times a night and therefore this is considered as criteria in addition to that outlined in Table 2.1.

2.14 Whilst ProPG does not define a measurement interval for the assessment of L_{AFmax} levels, research undertaken by Paxton et al[5] 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.

2.15 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.

2.16 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 2 minutes has been used to inform this assessment.

2.17 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'*

2.18 BS 8233 provides recommendations for the control of noise in and around buildings.

2.19 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.

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

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

2.20 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.

2.21 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.

2.22 Furthermore, due to the nationwide difficulty in satisfying the external criteria outlined above, the standard provides an over-arching consideration of how to treat external amenity areas as follows:

"... it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."

Acoustics Overheating and Ventilation Guide (AVOG) 2020

2.23 The AVOG was published by the Association of Noise Consultants (ANC) and The Institute of Acoustics (IOA) in 2020. The guide outlines a methodology for the assessment of airborne sound during overheating conditions, and emphasises the co-dependency of acoustics, ventilation and overheating design.

2.24 Many developments require closed windows to provide good internal acoustic conditions. This is in direct contrast to the fact that residents typically open windows in order to keep a building cool. These opposing requirements are becoming a major issue in the design of buildings, in particular for housing, especially as the aim is to avoid widespread use of mechanical ventilation and cooling systems.

2.25 AVOG prescribes a two-level assessment procedure, as follows:

- Level 1 – Site Risk Assessment, based on external free-field noise levels (similar to that of ProPG); and
- Level 2 – Assessment of Adverse Effect, based on internal ambient noise level and duration.

2.26 An AVOG Level 2 assessment gives consideration to internal noise levels on a sliding scale depending on the likelihood and duration of overheating.

2.27 This report considers an AVOG Level 1 assessment.

BS 6472-1:2008 *'Evaluation of human exposure to vibration in buildings (1 Hz to 80 Hz)*

2.28 BS 6472 contains a methodology for assessing the human response to vibration in terms of either the vibration dose value (VDV), or in terms of the acceleration or the peak velocity of the vibration, which is also referred to as peak particle velocity.

2.29 The guidance states that when the vibration is intermittent, as is the case at this site, the VDV may be used to assess the potential for impacts.

2.30 The weighted vibration levels can be aggregated to derive the VDV. The VDV is a single figure descriptor that represents the cumulative dose of transient vibrations, taking into account the frequency spectrum and duration of each event.

2.31 For occupants within buildings, the frequency-weighting curve is defined in BS 6841[6]. The VDV is determined over a 16-hour daytime period or 8-hour night-time period, and the guidance in BS 6472 is set out as follows:

Table 2.3: Vibration dose values ($ms^{-1.75}$) above which various degrees of adverse comment may be expected in residential buildings

	Low Probability of Adverse Comment	Adverse Comment Possible	Adverse Comment Probable
Residential Buildings 16-hour daytime	0.2 to 0.4	0.4 to 0.8	0.8 to 1.5
Residential Buildings 8-hour daytime	0.13	0.26	0.51

2.32 The above guidance relates to vibration measured at the point of entry into the human body, which is usually taken to mean the ground surface or at a point mid-span of an upper storey floor, rather than the point of entry into the building, for example a foundation element. Where the vibration is measured at another location, BS 6472 states that a transfer function should be applied; however, BS 6472 does not contain any guidance on suitable transfer functions.

2.33 Transfer functions take account of the energy losses that can occur between the ground and a building's foundations, as well as the amplification factors that can occur as the vibrational energy travels both up the building and across each floor span. The overall value of the transfer function will depend upon a number of factors, which include the type of ground conditions, the type of foundation, the type of building (e.g. wood framed or masonry etc.) and the type of floor construction.

2.34 Publications such as The Handbook of Urban Rail Noise and Vibration Control (reproduced in the Transportation Noise reference Book, 1987), Methods for Predicting Ground Noise and Vibration from Trains in Tunnels (Richard Greer 1999) and Transmission of Ground-borne Vibrations in Buildings (Jorgen Jakobson, Journal of Low Frequency Noise and Vibration, Vol.8 No.3 1989) provide a range of attenuation and amplification factors for different operating conditions. This information suggests an overall multiplication factor of 2.98 for a worst case scenario and 1.29 for a best case scenario

[6] BS 6841:1987 *'Measurement and Evaluation of Human Exposure to Whole-Body Mechanical Vibration and Repeated Shock'*

3.0 ENVIRONMENTAL SOUND AND VIBRATION SURVEY

3.1 An environmental sound and vibration survey was undertaken between Thursday 3rd and Friday 4th April 2025. The survey was undertaken in full accordance with the guidance set out in BS 7445[7].

3.2 Sound Level Meters (SLMs) were installed at two locations, and a Vibration Meter (VM) at one location, as follows:

Table 3.1: Continous Monitoring Positions

Monitoring Position	Location
CM1 and Vibration Dose Measurement 1 (VDM1)	North of the Site, approximately 10m from the railway
CM2	South of the Site, approximately 7m from Chalk Road

3.3 The measurement positions are identified in Figure 3.1.

Figure 3.1: Measurement Positions

Equipment

3.4 Measurements were taken using Class 1 integrating/averaging SLMs housed in environmental protection apparatus. The SLMs were installed in a free field position 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.

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

3.5 The SLMs were set up to capture the following parameters at a minimum: L_{Aeq} and L_{AFmax} values, and full details of the equipment used to undertake the survey are presented in Table 3.1.

Table 3.2: Equipment and Calibration Details

Measurement Position	Description	Manufacturer & Type No.	Serial No.	Calibration Due Date
CM1	Sound Level Meter	01dB Fusion	14157	11/09/2025
	Microphone	GRAS 40CD	466804	
	Calibrator	01dB CAL31	89091	16/10/2025
CM1	Sound Level Meter	01dB Fusion	14152	11/09/2026
	Microphone	GRAS 40CD	466821	
	Calibrator	01dB CAL31	89091	16/10/2025
VDM1	Vibration Meter	Vibrock V9000	2026	03/03/2025

Meteorological Conditions

3.6 During setup of the equipment, weather conditions were hot, sunny and dry with wind speeds of up to 4 m/s from the southeast. On collection of the equipment, weather conditions were again sunny and warm, with wind speeds were measured at 3.7 m/s from the east.

3.7 It is therefore considered that there were no adverse weather conditions that would have influenced sound levels during the survey.

Observations

3.8 Whist on site it was observed that the dominant sources of noise at CM1 were vehicles using Chalk Road; however, traffic was infrequent.

3.9 At CM2 the dominant noise source was trains, predominately passenger trains travelling regularly at high speed.

3.10 Additionally farm animals and livestock were audible whilst in site attendance.

3.11 No other noise sources were identified whilst in Site attendance.

Results

3.12 Time history graphs showing the sound level data for each measurement position are presented in **Appendix C**.

3.13 Table 3.3 provides a summary of measured assessment appropriate sound levels at CM1.

Table 3.3: 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)] $L_{AFmax,2min}$
Thursday 3rd	58[(b)]	55	80
Friday 4th	58[(C)]	-	-

[(a)] Maximum noise level not exceeded more than 10 times per night.
[(b)] T = 8hr
[(c)] T = 8hr

3.14 At CM1, the measured $L_{Aeq,T}$ sound levels were measured at 58 dB for the daytime and 55 dB for night-time. The derived $L_{Aeq,16hr}$ daytime sound level of 58 dB (rounding to the nearest whole number for assessment purposes) is deemed the most appropriate level for the daytime assessment at CM1. For the night time assessment, the $L_{Aeq,8hr}$ of 55 dB measured on Thursday 3rd will be used.

3.15 Analysis of the night-time $L_{AFmax,2min}$ levels shows that the individual events did not exceed 80 dB more than 10 times during the measured night-time period. This level occurred three times within the top ten maximum event levels and was only exceeded by 5 dB or more on one occasion; therefore, 80 dB is considered appropriate for the assessment.

3.16 Table 3.4 provides a summary of measured assessment appropriate sound levels at CM2.

Table 3.4: 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)] $L_{AFmax,2min}$
Thursday 3rd	51[(b)]	48	69
Friday 4th	53[(c)]	-	-

[(a)] Maximum noise level not exceeded more than 10 times per night.
[(b)] T = 8hr
[(c)] T = 8hr

3.17 At CM2, the measured $L_{Aeq,T}$ sound levels ranged between 51 and 53 dB for the daytime and 48 dB for night-time. The derived $L_{Aeq,16hr}$ daytime sound level of 52 dB is deemed the most appropriate level for the daytime assessment at CM2. For the night time assessment, the $L_{Aeq,8hr}$ of 48 dB measured on Thursday 3rd will be used.

3.18 Analysis of the night-time $L_{AFmax,2min}$ levels shows that the individual events did not exceed 69 dB more than 10 times during the measured night-time period. This level occurred once within the top ten maximum event levels and was exceeded by 5 dB or more on five occasions. It should be noted; however, that noise levels rose considerably at 04.30, indicating that dawn chorus occurred at this time. Most of the maxima energy occurs after 04.30; therefore, 69 dB is considered appropriate for the assessment.

Vibration Survey Results

3.19 Vibration Dose Value (VDV) measurements have been processed in accordance with BS 6472, and the processed data is presented in **Appendix D**.

3.20 The maximum day and night-time VDV across the monitoring period, which occurred in the z-axis during both the day and night-time, are summarised in Table 3.5.

Table 3.5: Summary of eVDV Measurements at VDM1, $ms^{-1.75}$

Date	Daytime (z axis)	Night-time (z axis)
Thursday 3rd	0.088	0.065
Friday 4th	0.087	-

3.21 The highest daytime and night-time eVDV values representing the boundary of the Site closest to the railway were 0.088 $ms^{-1.75}$ and 0.065 $ms^{-1.75}$ respectively.

4.0 ASSESSMENT METHODOLOGY

Acoustic Modelling

4.1 An acoustic model of the Site and environs has been generated in Datakustik CadnaA® modelling software. Noise source emissions have been informed by the environmental sound survey presented in Section 3.0.

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 9613-2[8].

4.3 The modelling assumptions and input information for the acoustic model are as follows:

- Digital Terrain Model – Lidar 1m (Environment Agency, downloaded on 11th April 2025);
- 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;
- Buildings set to be reflective only with no absorption coefficient;
- First order reflections included in the modelling;
- Temperature set to 10°C; and
- Relative humidity set to 70%.

BS 8233 Assessment

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

Table 4.1: Sound Levels Used to Calibrated 3D Acoustic Model, dB

Parameter	CM1	CM2
Daytime Ambient $L_{Aeq,16hr}$	58	52
Night-time Ambient $L_{Aeq,8hr}$	55	48
Night-time Maximum $L_{AFmax,2min}$	77	69

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 for the following scenarios:

- 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 $L_{AFmax,2min}$ external sound levels at first floor (4m) height.

4.6 For the purpose of this assessment, an illustrative framework plan has been used to provide an indication as to where plots may be located and therefore demonstrate the likely impact across the Site. However, it is

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

important to note that this layout is subject to reserved matters and will therefore be subject to changes throughout the planning process.

4.7 For conciseness, this report tabulates the most exposed receptors to give context to the most stringent mitigation measures. All other receptors are assessed through the various sound level contour and mitigation reference drawings presented in the various appendices to this report.

4.8 The illustrative framework plan, shows one of the most exposed proposed receptors to Chalk Road is Plot 2, approximately 7.5m from Chalk Road, whilst one of the most exposed dwellings to the railway is Plot 11, approximately 38m from the railway. This is illustrated in the drawings found in **Appendix E**.

5.0 ACOUSTICS ASSESSMENT

ProPG Initial Noise Risk Assessment

5.1 As required by the ProPG, an Initial Noise Risk Assessment (INRA) is presented Table 5.1, based on the modelled sound levels.

Table 5.1: Initial Site Noise Risk Assessment, dB

Risk	Negligible		Low		Medium		High	
Period	Day	Night	Day	Night	Day	Night	Day	Night
Pro PG Threshold	< 50	< 40	50 – 60	40 – 50	60 – 70	50 – 60	> 70	> 60
Plot 2			55			51		
Risk Assessment			Low			Medium		
Plot 11	48			45				
Risk Assessment	Negligible			Low				

5.2 Based on the modelled sound levels, Plot 2, the most exposed dwelling to the Chalk Road falls within the ProPG risk category of 'Low' for the daytime, and 'Medium' for the night-time. Where a 'Low' risk is identified, ProPG states that the Site "*is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed*". Where a 'Medium' risk is identified, ProPG states that the Site *"is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS".*

5.3 Plot 11, the most exposed dwelling to the railway, falls within the ProPG risk category of 'Negligible' for the daytime and 'Low' risk is identified during both the daytime and night-time. Where 'Negligible' risk is identified, ProPG states that the site "is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds".

BS 8233 External Amenity Criteria

5.4 The criterion often the most difficult to meet is the BS 8233 outdoor criterion of 55 dB $L_{Aeq,16hr}$ applicable to private amenity spaces such as gardens.

5.5 Based on the acoustic model with the proposed site layout in situ, the BS 8233's lower-level criterion of 50 dB $L_{Aeq,16hr}$ will be satisfied for the whole of the site. This is identified on the the daytime $L_{Aeq,16hr}$ sound level contour map shown on drawing 29524_04_120_01, found in **Appendix E**.

5.6 It should be noted that gardens to plots on the southern boundary facing Chalk Road, meet the lower-level criterion as they are located behind the houses. It is recommended that this detail should remain throughout any layout changes at the Reserved Matters stage, in order to ensure this criterion is met.

BS 8233 Internal Acoustic Criteria

5.7 Table 5.2 presents the required external to internal reduction requirements for the most exposed indicative receptors to Chalk Road (Plot 1), and the railway line (Plot 11).

Table 5.2: Required Façade Performance, dB

Plot	Parameter	External Level	Internal Criteria	Required Reduction
2	Daytime Ambient $L_{Aeq,16hr}$	55	35	20
	Night-time Ambient $L_{Aeq,8hr}$	51	30	21
	Night-time Maximum $L_{AFmax,2min}$	72	45	27
11	Daytime Ambient $L_{Aeq,16hr}$	48	35	13
	Night-time Ambient $L_{Aeq,8hr}$	45	30	15
	Night-time Maximum $L_{AFmax,2min}$	67	45	22

5.8 For the most exposed dwelling overlooking Chalk Road (Plot 2), the results in Table 5.2 show that a sound reduction of approximately 20 dB will be required to achieve the 35 dB $L_{Aeq,16hr}$ criteria within habitable rooms. Façade performance for bedrooms is driven by the night-time maximum scenario, with a sound reduction of up to 27 dB required to achieve the 45 dB L_{AFmax} criteria.

5.9 For the most exposed dwelling overlooking the railway (Plot 11), the results in Table 5.2 show that a sound reduction of approximately 13 dB will be required to achieve the 35 dB $L_{Aeq,16hr}$ criteria within habitable rooms. Façade performance for bedrooms is driven by the night-time maximum scenario, with a sound reduction of up to 22 dB required to achieve the 45 dB L_{AFmax} criteria.

AVOG Level 1 Assessment

5.10 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.

5.11 The initial Level 1 assessment is presented in Table 5.3.

Table 5.3: AVOG Level 1 Assessment

Plot	Parameter	Predicted External Level dB	Level 1 Risk Grading	Level 2 Advised?
2	Daytime Ambient $L_{Aeq,16hr}$	55	Low	Optional
	Night-time Ambient $L_{Aeq,8hr}$	51	Low	Optional
11	Daytime Ambient $L_{Aeq,16hr}$	48	Negligible	Not required
	Night-time Ambient $L_{Aeq,8hr}$	45	Negligible	Not required

5.12 The results demonstrate that at Plot 2 an AVOG Level 2 assessment is optional; whereas, at Plot 11, an AVOG Level 2 assessment is not required.

5.13 It should be noted that the night-time maximum levels will drive the acoustic design and therefore, with the introduction of the maximum night-time criteria presented within AD-O[9], further consideration of internal sound levels during periods of overheating will be required with reference to the criteria outlined in AD-O.

5.14 Nevertheless, demonstrating a suitable overheating strategy is not an outline planning application consideration, and could therefore be considered at the Reserved Matters stage, or as part of other Building Control matters.

[9] The Building Regulations 2010, Overheating, Approved Document 'O'.

6.0 VIBRATION ASSESSMENT

Railway Vibration

6.1 Comparing the worst case measured vibration levels presented in Section 2.0 with the guidance contained in BS 6472 (see Table 2.2), it can be seen that the vibration levels at a distance of approximately 10m from the nearest track, indicate that there is no probability of adverse comment during the daytime and night time (i.e., the measured levels are below the upper thresholds of the 'low' category).

6.2 Vibration will undergo additional attenuation with distance away from the Site boundary, although this in turn may be countered by some increase due to the transfer functions into and within the building.

6.3 The vibration exposures for new dwellings, e.g., at a distance of approximately 38m from the nearest track, are shown in Table 6.1 under the 'worst case' and 'best case' transfer functions.

Table 6.1: Probability of Adverse Comment due to Vibration Dose Values, $ms^{-1.75}$

Scenario	Daytime		Night-time	
	VDV	Adverse Comment?	VDV	Adverse Comment?
Site Boundary	0.088	None	0.065	None
Worst case transfer function predicted at indicative distance of 38m from the nearest track	0.069	None	0.050	None
Best case transfer function predicted at indicative distance of 38m from the nearest track	0.029	None	0.022	None

6.4 Comparing the worst case measured vibration levels presented in Section 2.0 with the guidance contained in BS 6472, it can be seen that the vibration levels at a distance of approximately 38m at Plot 11, indicate that there is no probability of adverse comment during the daytime and night time (i.e., the measured levels are below the upper thresholds of the 'low' category).

6.5 Therefore, it can be considered that no further mitigation is required regarding vibration isolation.

7.0 MITIGATION

External Sound Levels

7.1 As discussed previously, the acoustic model shows that BS 8233's lower-level criterion of 50 dB $L_{Aeq,16hr}$ will be satisfied for all plots without any further mitigation.

Internal Sound Levels

7.2 Acoustic modelling has demonstrated potential façade sound levels and, in accordance with BS 8233 and ProPG sound reduction performance requirements of the façade have been determined.

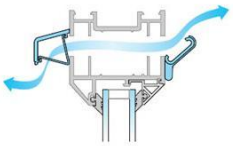
7.3 In terms of acoustics, windows and ventilation strategies are the 'weakest' acoustics point in any façade and subsequently, the composite sound reduction performance is typically dominated by these elements. Therefore, minimum performance requirements to be provided by the glazing and ventilation elements at all dwellings are presented herein.

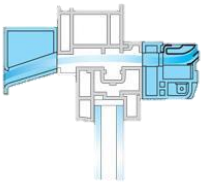
7.4 Drawing on the above, and the acoustic modelling undertaken, Table 7.1 provides typical reduction requirements and potential glazing and ventilation solutions across the Site in order to demonstrate compliance with the internal sound level criteria outlined in BS 8233, ProPG and the ventilation requirements of AD-F.

7.5 Most habitable rooms across the Site can comply with the relevant acoustic criteria through standard double glazing and direct airpath window mounted trickle ventilators, however, some enhanced glazing and ventilation will be required where plots face Chalk Road and the railway.

7.6 This table should be read in conjunction with the drawings 29524_04_120_04 and 29524_04_120_05 in **Appendix F**, which shows corresponding colour coded mitigation references. For each reference in Table 7.1, the sound reduction performance requirements, in octave band and weighted reduction format, are presented in **Appendix G**.

Table 7.1: Suggested Internal Mitigation Measures

Mitigation Ref.	Example Glazing Solution	Example Whole Dwelling Ventilation Solution (AD-F)
Ref. A	4mm pane 12mm air space 4mm pane Approx. $R_w + C_{tr}$ = 27 dB	<u>Standard Non-Acoustic Trickle Vent</u> Slots typically located in the window frame.  Approx. $D_{n,e,w} + C_{tr}$ = 32 dB

Mitigation Ref.	Example Glazing Solution	Example Whole Dwelling Ventilation Solution (AD-F)
Ref. B	8mm pane 12mm air space 10mm pane Approx. $R_w + C_{tr}$ = 33 dB	<u>Acoustically Rated Trickle Vent</u> Slots typically located in the window frame with more torturous path and acoustic lining  Approx. $D_{n,e,w} + C_{tr}$ = 35 dB

8.0 CONCLUSIONS

8.1 MEC has been commissioned by Richborough to undertake an Acoustic and Vibration Assessment for a proposed residential development on Chalk Road, Higham, Rochester.

8.2 Assessment of the residential uses has been undertaken in accordance with ProPG and BS 8233, with initial consideration also given to internal sound levels during periods of overheating in accordance with AVOG.

8.3 Acoustic modelling has demonstrated that BS 8233's lower-level criterion of 50 dB $L_{Aeq,16hr}$, will be satisfied at all garden locations on the Site without the need for any additional mitigation.

8.4 With regards to internal acoustic conditions across the Site, most habitable rooms will satisfy the relevant criteria through the provision of standard thermal double glazing and direct airpath window mounted trickle ventilators, however, some enhanced glazing and ventilation will be required where plots face Chalk Road and the railway in order to achieve the whole-dwelling ventilation requirements of AD-F.

8.5 When considering the internal sound levels during periods of overheating, an open window acoustic strategy is unlikely permissible for the most exposed dwellings to the railway and Chalk Road. Whereas, the majority of the site will likely be permissible. Nevertheless, demonstrating a suitable overheating strategy is not an outline planning application consideration, and could therefore be considered at the Reserved Matters stage, or as part of other Building Control matters.

8.6 With regard to vibration, it can be seen that the vibration levels indicate that there is no probability of adverse comment during the daytime and night time (i.e., the measured levels are below the upper thresholds of the 'low' category).

8.7 It is therefore considered that with the implementation of the recommended mitigation strategy, the Site is suitable for residential development.

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APPENDICES

APPENDIX A

NOTES

No dimensions should be scaled during construction and any missing dimensions required should be requested and confirmed before proceeding. All dimensions must be checked on site and agreed with the client prior to construction.

The scale bar provided is for use so that the drawings can be Scaled during the planning application process.

0 50

Scale bar 50mm at 1:1

SITE BOUNDARY

A 18.07.2025 RLB UPDATED TO INCL VIS SPLAYS. KB

Project

LAND OFF CHALK ROAD
LOWER HIGHAM
GRAVESHAM

Title

LOCATION PLAN

Scale	Date
1:1250 @A3	APRIL 2025
Drawn	Checked
JT	MB

Drawing Number 8990/P100

Revision A

Saunders
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NORTH

SP

MP 28.25

Atlantis

7.3m

Cuckold's Corner

Michele Cottages

Avonlea

8.5m

Haselden Cottages

Orchard View

Whitebread House

Cherrydene

The Hedgerows

16

9

NOTES

This drawing to be read in accordance with the specification/Bills of Quantities and related drawings. No Dimensions to be scaled from this drawing. All stated dimensions to be verified on site and the Architect notified of any discrepancies.

0 50

Scale bar 50mm at 1:1

KEY

- Site Boundary
- Railway line
- Proposed access/egress for all modes (subject to detailed design)
- Proposed location of SuDs/Attenuation features
- Proposed Green Amenity Space (including existing pond, children's play provision, footpaths, community orchard and drainage)
- Proposed Residential Development
- Proposed area for unallocated parking
- Focal space
- Recreational footpath
- Existing Trees
- Indicative proposed trees
- Proposed location for community orchard
- Proposed location for children's play

A 22.07.2025 MINOR AMENDMENTS FOLLOWING CLIENT COMMENTS. KB

Project

LAND OFF CHALK ROAD
LOWER HIGHAM
GRAVESHAM

Title

ILLUSTRATIVE DEVELOPMENT FRAMEWORK PLAN

Scale	Date
1:1000 @A3	JULY 2025
Drawn	Checked
KB	MB

Drawing Number	Revision
8990/P103	A

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APPENDICES

APPENDIX B

GLOSSARY OF TECHNICAL TERMS

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 20μPa (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 sounds s1 and s2 is given by 20 log10 (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 20μPa.
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 21/3 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 90th percentile maximum event level (L_{AFmax}) measured during a period. Used for assessing night-time maximum levels under typical and overheating conditions.

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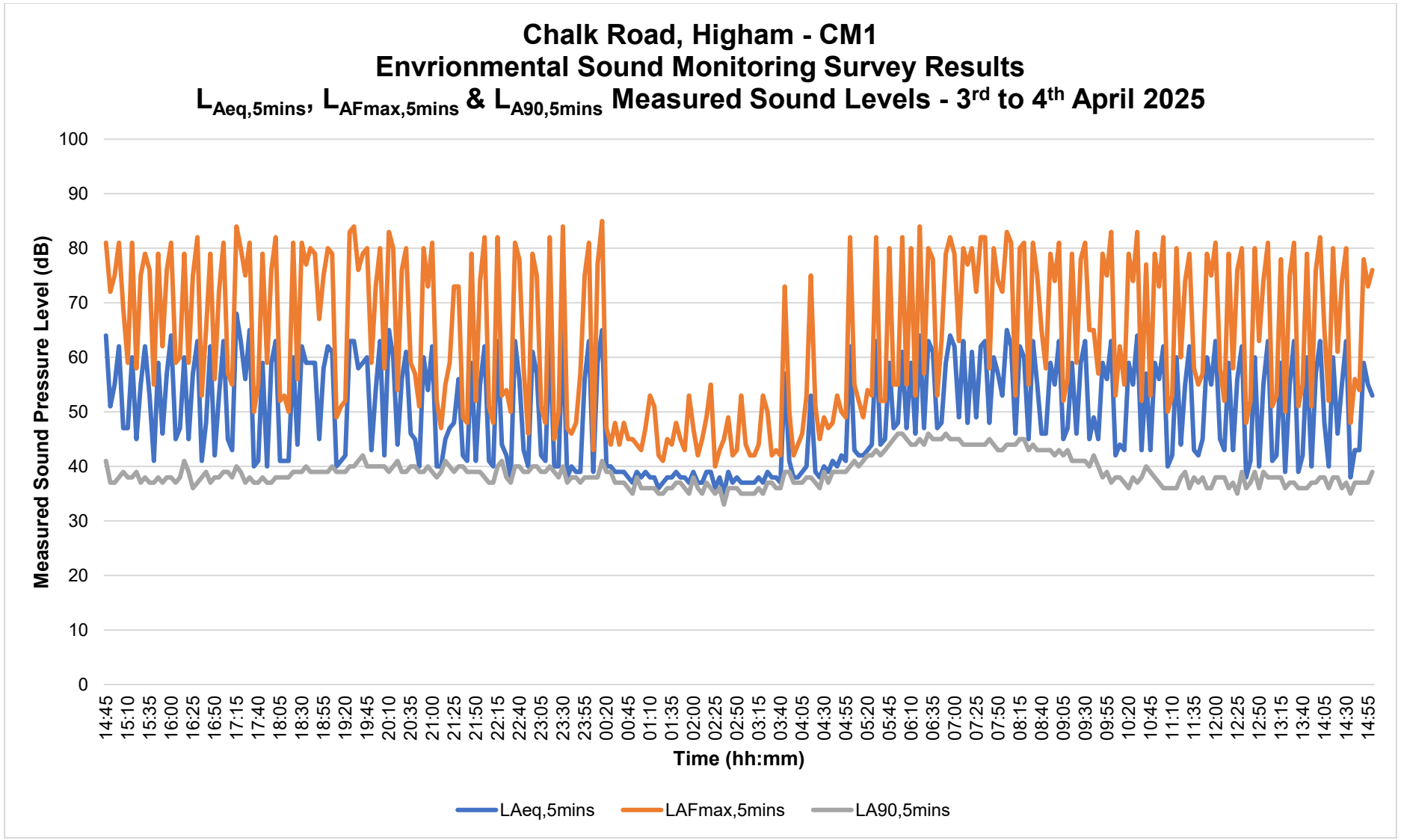
APPENDICES

APPENDIX C


Chalk Road, Higham - CM1
Envrionmental Sound Monitoring Survey Results
$L_{Aeq,5mins}$, $L_{AFmax,5mins}$ & $L_{A90,5mins}$ Measured Sound Levels - 3rd to 4th April 2025
Measured Sound Pressure Level (dB)
100
90
80
70
60
50
40
30
20
10
0
14:45
15:10
15:35
16:00
16:25
16:50
17:15
17:40
18:05
18:30
18:55
19:20
19:45
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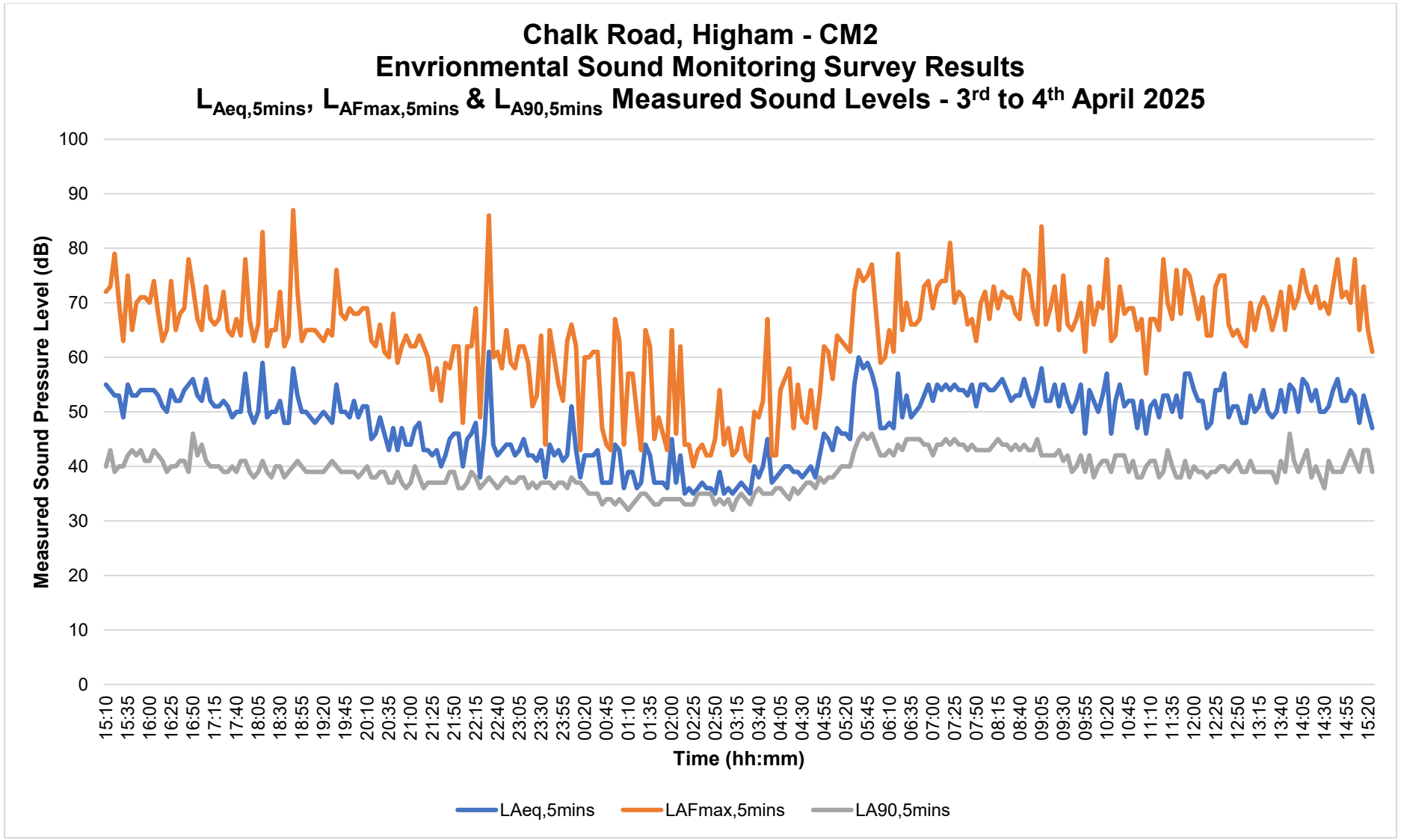
08:40
09:05
09:30
09:55
10:20
10:45
11:10
11:35
12:00
12:25
12:50
13:15
13:40
14:05
14:30
14:55
Time (hh:mm)
LAeq,5mins
LAFmax,5mins
LA90,5mins


Chalk Road, Higham - CM2
Envrionmental Sound Monitoring Survey Results
LAeq,5mins, LAFmax,5mins & LA90,5mins Measured Sound Levels - 3rd to 4th April 2025
Measured Sound Pressure Level (dB)
100
90
80
70
60
50
40
30
20
10
0
15:10
15:35
16:00
16:25
16:50
17:15
17:40
18:05
18:30
18:55
19:20
19:45
20:10
20:35
21:00
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00:45
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09:05
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09:55
10:20
10:45
11:10
11:35
12:00
12:25
12:50
13:15
13:40
14:05
14:30
14:55
15:20
Time (hh:mm)
LAeq,5mins
LAFmax,5mins
LA90,5mins

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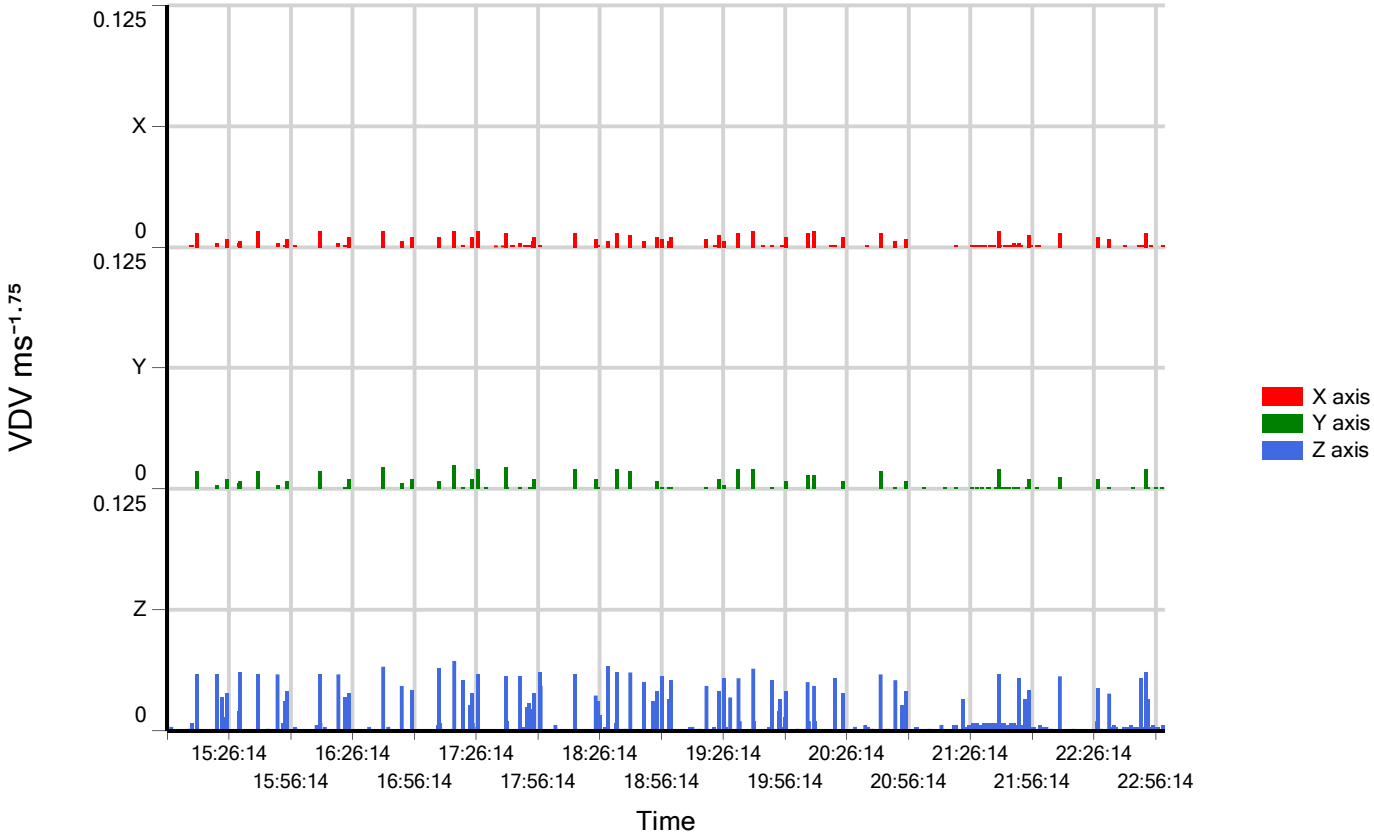
APPENDICES

APPENDIX D

V9000 Seismograph Serial Number 2026 Calibrate by: 3/2026

VDV Graph Location

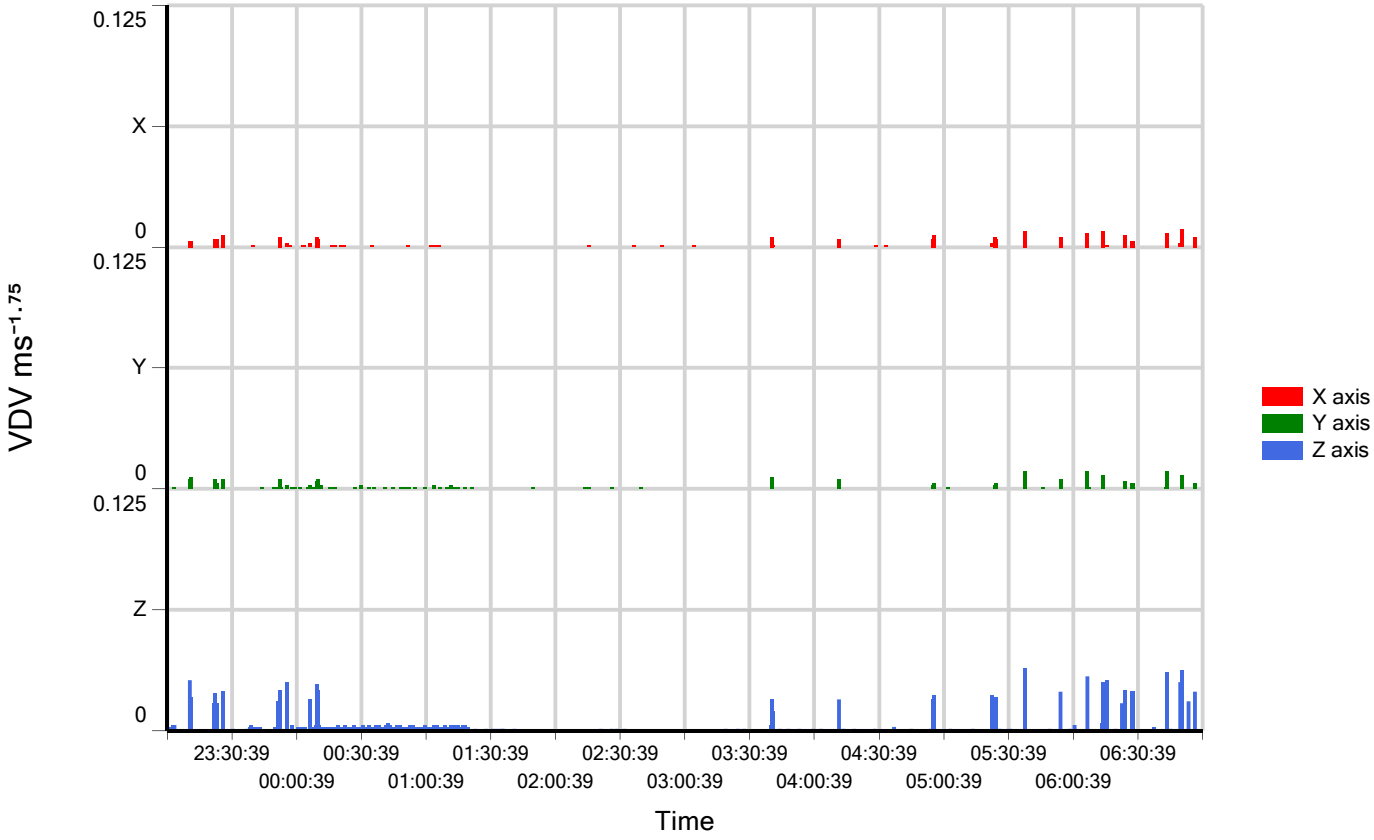


Event Number	3
Serial Number	2026
Event Type	VDV
Monitoring Mode	VDV $ms^{-1.75}$
Start Date	3/4 /2025
Start Time	14:56:14

Channel A - VDV	16 Hour VDV	Event VDV
X Axis	0.02$ms^{-1.75}$	0.017$ms^{-1.75}$
Y Axis	0.025$ms^{-1.75}$	0.021$ms^{-1.75}$
Z Axis	0.088$ms^{-1.75}$	0.075$ms^{-1.75}$

V9000 Seismograph Serial Number 2026 Calibrate by: 3/2026

VDV Graph Location

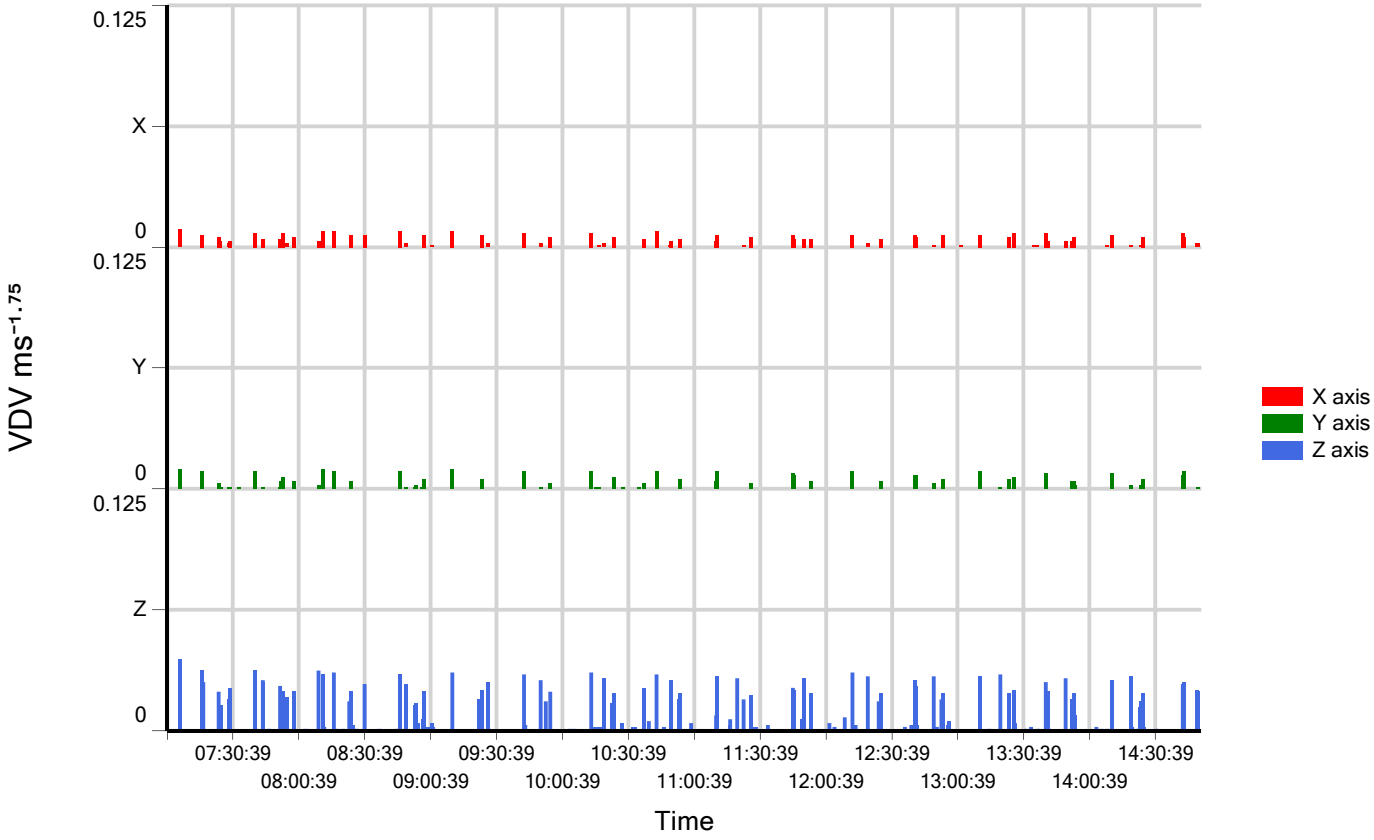


Event Number	4
Serial Number	2026
Event Type	VDV
Monitoring Mode	VDV $ms^{-1.75}$
Start Date	3/4 /2025
Start Time	23:00:39

Channel A - VDV	8 Hour VDV	Event VDV
X Axis	0.016$ms^{-1.75}$	0.014$ms^{-1.75}$
Y Axis	0.016$ms^{-1.75}$	0.014$ms^{-1.75}$
Z Axis	0.065$ms^{-1.75}$	0.054$ms^{-1.75}$

V9000 Seismograph Serial Number 2026 Calibrate by: 3/2026

VDV Graph Location



Event Number	5
Serial Number	2026
Event Type	VDV
Monitoring Mode	VDV $ms^{-1.75}$
Start Date	4/4 /2025
Start Time	7:00:39

Channel A - VDV	16 Hour VDV	Event VDV
X Axis	0.02$ms^{-1.75}$	0.017$ms^{-1.75}$
Y Axis	0.024$ms^{-1.75}$	0.02$ms^{-1.75}$
Z Axis	0.087$ms^{-1.75}$	0.073$ms^{-1.75}$

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APPENDICES

APPENDIX E

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:	DRN:	CHK:	APP:	DATE:
A	UPDATED MASTERPLAN	HJ	MH	AB	15.08.25
-		CP	EW	MH	16.07.25

PROJECT:
CHALK ROAD,
HIGHAM

DRAWING TITLE:
DAYTIME AMBIENT SOUND LEVELS
LAeq,16hour

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29524_04_120_01

REVISION:	SHEET SIZE:	SCALE:
A	A3	NFS

STATUS:
FOR INFORMATION / APPROVAL

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Birmingham | Brighton | Leicester

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

NOTES:

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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:	DRN:	CHK:	APP:	DATE:
A	UPDATED MASTERPLAN	HJ	MH	AB	15.08.25
-		CP	EW	MH	16.07.25

PROJECT:
CHALK ROAD,
HIGHAM

DRAWING TITLE:
NIGHT-TIME AMBIENT SOUND LEVELS
LAeq,8hour

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29524_04_120_02

REVISION:	SHEET SIZE:	SCALE:
A	A3	NFS

STATUS:
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Website: www.m-ec.co.uk

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:	DRN:	CHK:	APP:	DATE:
A	UPDATED MASTERPLAN	HJ	MH	AB	15.08.25
-		CP	EW	MH	16.07.25

PROJECT:
CHALK ROAD,
HIGHAM

DRAWING TITLE:
NIGHT-TIME MAXIMUM SOUND LEVELS
LAFmax,T

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29524_04_120_03

REVISION:	SHEET SIZE:	SCALE:
A	A3	NFS

STATUS:
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Website: www.m-ec.co.uk

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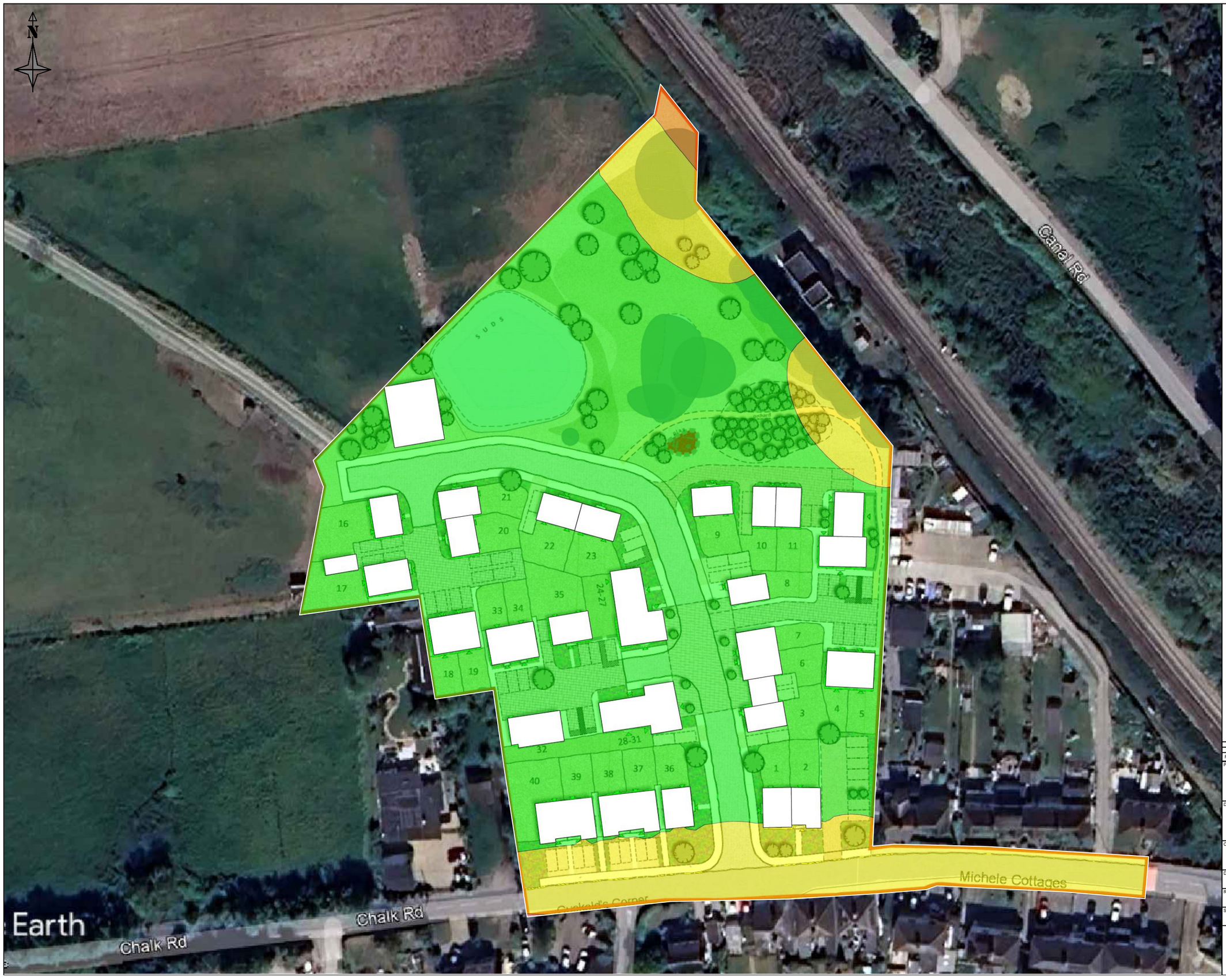
APPENDICES

APPENDIX F



NOTES:

1. DO NOT SCALE THIS DRAWING.
2. Please refer to report reference 29524–ENV–0401 for details on the proposed glazing and ventilation references.

KEY

Ref. A

Ref. B

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
A	UPDATED MASTERPLAN	HJ	MH	AB	15.08.25
-		CP	EW	MH	16.07.25

PROJECT:
CHALK ROAD,
HIGHAM

DRAWING TITLE:
MITIGATION REFERENCE FOR HABITABLE BEDROOMS

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29524_04_120_04

REVISION:	SHEET SIZE:	SCALE:
A	A3	NFS

STATUS:
FOR INFORMATION / APPROVAL

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Email: group@m-ec.co.uk
Website: www.m-ec.co.uk

NOTES:

1. DO NOT SCALE THIS DRAWING.
2. Please refer to report reference 29524–ENV–0401 for details on the proposed glazing and ventilation references.

KEY

Ref. A

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
A	UPDATED MASTERPLAN	HJ	MH	AB	15.08.25
-		CP	EW	MH	16.07.25

PROJECT:
CHALK ROAD,
HIGHAM

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

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29524_04_120_05

REVISION:	SHEET SIZE:	SCALE:
A	A3	NFS

STATUS:
FOR INFORMATION / APPROVAL

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Email: group@m-ec.co.uk
Website: www.m-ec.co.uk

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APPENDICES

APPENDIX G

Reference A Performance Requirements

Façade Element	Sound Insulation Performance Requirements (dB) in Octave Band Centre Frequencies (Hz)						R_w / $D_{ne,w}$ (dB)	C_{tr} (dB)
	125	250	500	1k	2k	4k		
Glazing	22	20	26	36	39	31	31	-4
Ventilation (Trickle)	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 / $D_{ne,w}$ (dB)	C_{tr} (dB)
	125	250	500	1k	2k	4k		
Glazing	29	27	35	37	36	45	36	-3
Ventilation (Trickle)	31	35	40	39	31	31	36	-1
The glazing reduction requirements can typically be found in a configuration of 8/12/10. The background ventilation requirements can be found in window mounted acoustic trickle ventilators.								

Minimum performance requirements for overheating ventilation only applicable if passive ventilation is used. If mechanical ventilation is chosen, please refer to the main body of the acoustics report for suitable noise limits.

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 $D_{ne,w}$ + C_{tr} should be adhered to at a minimum.

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- TRANSPORT
- FLOOD RISK & DRAINAGE
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