MEC Consulting Group

ACOUSTIC AIR

Land East of Wrotham Road, Meopham
Acoustics Assessment
September 2025

Report Ref: 29473-ENV-0401

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Acoustics Assessment
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REPORT REF: 29473-ENV-0401

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REGISTRATION OF AMENDMENTS

Date	Rev	Comment	Prepared By	Checked By	Approved By
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CONTENTS

APPENDICES

1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Richborough, to undertake an Acoustics Assessment in support of a proposed residential development on Land East of Wrotham Road, Meopham (hereafter referred to as 'the Site'). A site location plan is provided in **Appendix A**.

Existing Site

1.2 The Site, comprised of arable land, is bound by Green Lane to the north; arable land to the east; existing residential and further arable land to the south; and Wrotham Road to the west, with various retail uses and Meopham Community Academy located beyond.

1.3 The principal source of noise affecting the Site is predicted to be from road traffic using Wrotham Road and Green Lane, coupled with any contributions from the neighbouring retail uses and Meopham Community Academy.

Development Proposals

1.4 The development proposals comprise:

Outline application for the erection of up to 350 residential dwellings, public open space and associated works. Approval is sought for the principal means of vehicular access from Wrotham Road and all other matters are reserved.

1.5 A parameter plan is provided in **Appendix A**.

Assessment Scope

1.6 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 based upon the measured sound level data;
- Embedded façade mitigation measures in the form of glazing and whole-dwelling ventilation specifications have been provided to demonstrate compliance with the guidance contained within ProPG[1], BS 8233[2]; and AVOG[3]; and
- Where required, appropriate mitigation measures have been provided to demonstrate compliance with the relevant standards.

1.7 The conclusions of this report aim to demonstrate to the Gravesham Borough Council (hereafter referred to as the 'Local Authority') that internal acoustic conditions will be compliant with the relevant British Standards and Acoustics Guidance.

[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.

Disclaimer

1.8 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.

1.9 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.

2.0 STANDARDS AND GUIDANCE

General

2.1 An acoustics 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) 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'*; and
- Acoustics Ventilation and Overheating Guide (AVOG) 2020.

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

Professional Practice Guidance on Planning and Noise (ProPG)

2.4 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.

2.5 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.

2.6 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.

2.7 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.

2.8 Whilst ProPG does not define a measurement interval for the assessment of L_{AFmax} levels, research undertaken by Paxton et al[4] indicates that, for Maximum Event Level assessments, a sampling interval of

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

between 1 and 3 minutes relates most closely to how awakening events are experienced by people in reality when compared to longer sampling periods.

2.9 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.

2.10 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.

2.11 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'*

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

2.13 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 2.1.

Table 2.1: 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

2.14 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.

2.15 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.

2.16 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)

2.17 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.

2.18 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.

2.19 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.

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

2.21 This report considers an AVOG Level 1 assessment.

3.0 ENVIRONMENTAL SOUND SURVEY

3.1 An environmental sound survey was undertaken between Tuesday 1st and Wednesday 2nd April 2025. The survey was undertaken in full accordance with the guidance set out in BS 7445[5].

3.2 Sound Level Meters (SLMs) were installed at two locations, as follows:

- Continuous Measurement 1 (CM1): along the western boundary, approximately 16m from the carriageway edge of Wrotham Road; and
- Continuous Measurement 2 (CM2): along the northern boundary, approximately 14m from the carriageway edge of Green Lane.

3.3 A monitoring location plan is provided in Figure 3.1.

Figure 3.1: Measurement Positions

Note: Red line boundary is approximate

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.

[5] 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}, 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	Sound Level Meter	01dB Fusion	14157	11/09/2025
	Microphone	GRAS 40CD	466804	
	Calibrator	01dB CAL31	89091	16/10/2025
CM2	Sound Level Meter	01dB Fusion	14152	11/09/2026
	Microphone	GRAS 40CD	466821	
	Calibrator	01dB CAL31	89091	16/10/2025

Meteorological Conditions

3.6 During both setup and collection of the SLMs, weather conditions were sunny and clear, with north easterly winds of up to 4.4 m/s.

3.7 Overall, these conditions are not considered to be adverse, and would not have significantly influenced the survey outcome.

Observations

3.8 Site notes indicate the dominant source of noise to be from road traffic using Wrotham Road, and that noise from the neighbouring school during the lunch-hour was not audible on the Site above the road traffic noise. There was also no audible noise from the retail uses on the opposite side of Wrotham Road, and certainly no dominant noise that would warrant assessment under BS 4142.

Results

3.9 Time history graphs are provided in **Appendix C**.

3.10 Table 3.2 and Table 3.3 provide a summary of measured assessment appropriate sound levels at CM1 and CM2 respectively.

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)] $L_{AFmax,1min}$
Tue 1st	58[(b)]	52	69
Wed 2nd	59[(c)]	-	-

[(a)] Maximum noise level not exceeded more than 10 times per night.
[(b)] T = 11hr
[(c)] T = 5hr

3.11 At CM1, the derived daytime $L_{Aeq,16hr}$ was 59 dB (rounding to the nearest whole number for assessment purposes), while the measured night-time $L_{Aeq,8hr}$ was 52 dB.

3.12 Analysis of the night-time $L_{AFmax,1min}$ noise levels shows that the individual noise events did not exceed 69 dB more than 10 times during the measured night-time period. Therefore, a value of 69 dB L_{AFmax} is considered appropriate for assessment purposes.

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)] $L_{AFmax,1min}$
Tue 1st	51[(b)]	47	65
Wed 2nd	52[(c)]	-	-

[(a)] Maximum noise level not exceeded more than 10 times per night.
[(b)] T = 11hr
[(c)] T = 5hr

3.13 At CM2, the derived daytime $L_{Aeq,16hr}$ was 52 dB, while the measured night-time $L_{Aeq,8hr}$ was 47 dB.

3.14 Analysis of the night-time $L_{AFmax,1min}$ noise levels shows that the individual noise events did not exceed 65 dB more than 10 times during the measured night-time period. Therefore, a value of 65 dB L_{AFmax} is considered appropriate for assessment purposes.

4.0 ASSESSMENT METHODOLOGY

Acoustic Modelling

4.1 An acoustic model of the Site and environs has been generated in Datakustik CadnaA® modelling software. 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[6].

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

- Digital Terrain Model – Lidar 1m (Environment Agency, downloaded on 24th March 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%.

Source Sound Levels

4.3 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 $L_{Aeq,16hr}$	59	52
Night-time Ambient $L_{Aeq,8hr}$	52	47
Night-time Maximum $L_{AFmax,1min}$	69	65

Modelled Scenarios

4.4 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:

- 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.

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

5.0 ACOUSTICS ASSESSMENT

5.1 The following assessment has been undertaken using indicative receptors based on the illustrative framework plan. For conciseness, this report tabulates the most exposed indicative receptors as Plot X overlooking Wrotham Road, and Plot Y overlooking Green Lane, to give context to the most stringent mitigation measures. All other receptors are assessed through the sound level contour drawings presented in **Appendix D**.

ProPG Initial Noise Risk Assessment

5.2 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
ProPG Threshold	< 50	< 40	50 – 60	40 – 50	60 – 70	50 – 60	> 70	> 60
Plot X			54	49				
Risk Assessment			Low					
Plot Y	47			42				
Risk Assessment	Negligible			Low				

5.3 Based on the modelled sound levels, the most exposed receptor overlooking Wrotham Road falls within the ProPG risk category of 'Low' risk during both the daytime and night-time, 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*".

5.4 The most exposed receptor overlooking Green Lane falls within the ProPG risk category of 'Negligible' risk during the daytime, for which the guidance states that "*these noise levels indicate that the development Site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds."* Whilst for night-time, the most exposed receptor overlooking Green Lane falls within the 'Low' risk category.

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.

BS 8233 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 The daytime $L_{Aeq,16hr}$ sound level contour map, shown on drawing 29473_04_120_01 in **Appendix D**, indicates that standard mitigation in the form of 1.8m high close boarded timber fencing will enable BS 8233's lower-level criterion of 50 dB $L_{Aeq,16hr}$ to be satisfied across the Site.

BS 8233 Internal Acoustic Criteria

5.8 Table 5.2 presents the required external to internal reduction requirements for the most exposed receptors overlooking Wrotham Road (Plot X) and Green Lane (Plot Y).

Table 5.2: Required Façade Performance, dB

Plot	Parameter	External Level	Internal Criteria	Required Reduction
X	Daytime Ambient $L_{Aeq,16hr}$	54	35	19
	Night-time Ambient $L_{Aeq,8hr}$	49	30	19
	Night-time Maximum $L_{AFmax,1min}$	66	45	21
Y	Daytime Ambient $L_{Aeq,16hr}$	47	35	12
	Night-time Ambient $L_{Aeq,8hr}$	42	30	12
	Night-time Maximum $L_{AFmax,1min}$	60	45	15

5.9 For the most exposed dwellings overlooking Wrotham Road (Plot X), the results in Table 5.2 show that a sound reduction of up to 19 dB will be required to achieve the internal $L_{Aeq,16hr}$ criterion during the daytime, with a sound reduction of up to 21 dB required to achieve the 45 dB L_{AFmax} criterion for new receptors during the night-time.

5.10 For the most exposed dwelling overlooking Green Lane (Plot Y), the results in Table 5.2 show that a sound reduction of approximately 12 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 15 dB required to achieve the 45 dB L_{AFmax} criterion.

AVOG Level 1 Assessment

5.11 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.

5.12 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?
X	Daytime Ambient $L_{Aeq,16hr}$	54	Low	Optional
	Night-time Ambient $L_{Aeq,8hr}$	49	Low	Optional
Y	Daytime Ambient $L_{Aeq,16hr}$	47	Negligible	Not required
	Night-time Ambient $L_{Aeq,8hr}$	42	Negligible	Not required

5.13 The results demonstrate that for the most exposed receptors to Wrotham Road, an AVOG Level 2 assessment is optional due to the low sound levels.

5.14 Whilst for the most exposed receptors to Green Lane, an AVOG Level 2 assessment is not required, which suggests that the use of opening windows as a primary means of mitigating overheating is not likely to result in adverse effect.

6.0 MITIGATION

External Sound Levels

6.1 For an indicative layout based on the illustrative framework plan, BS 8233's lower-level criterion of 50 dB $L_{Aeq,16hr}$ will likely be satisfied at all garden locations on the Site through the provision of standard 1.8m high close boarded timber fencing.

Internal Sound Levels

6.2 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.

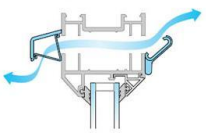
6.3 In terms of acoustics, windows and ventilation strategies are the 'weakest' acoustics point in any façade and subsequently, the composite sound reduction performance is typically dominated by these elements. Therefore, minimum performance requirements to be provided by the glazing and ventilation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

6.4 Drawing on the above, and the acoustic modelling undertaken, Table 6.1 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].

6.5 However, for the avoidance of doubt, all habitable rooms across the Site can comply with the relevant acoustic criteria through standard double glazing and direct airpath window mounted trickle ventilators.

6.6 For each reference in Table 6.1, the sound reduction performance requirements, in octave band and weighted reduction format, are presented in **Appendix E**.

Table 6.1: Suggested Internal Mitigation Measures

Example Glazing Solution	Example Whole-Dwelling Ventilation Solution (AD-F)
4mm glass panel 12mm air gap 4mm glass panel Approx. 27 dB $R_w + C_{tr}$	Standard Non-Acoustic Trickle Vent Direct airpath trickle vent located in the top of the window frame  Approx. $D_{ne,w} + C_{tr}$ = 32 dB

[7] The Building Regulations 2010, Ventilation, Approved Document F, 2021 Edition.

7.0 CONCLUSIONS

7.1 MEC has been commissioned by Richborough, to undertake an Acoustics Assessment for a proposed residential development on Land East of Wrotham Road, Meopham.

7.2 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

7.3 Acoustic modelling has demonstrated that, for an indicative layout based on the illustrative framework plan, BS 8233's lower-level criterion of 50 dB $L_{Aeq,16hr}$ will be satisfied at all garden locations on the Site through the provision of standard 1.8m high close boarded timber fencing.

Internal Sound Levels

7.4 With regards to internal acoustic conditions, the most exposed dwellings will satisfy the criteria in BS 8233 and ProPG through the provision of standard thermal double glazing and window mounted trickle ventilators to achieve the whole-dwelling ventilation requirements of AD-F.

Overheating Considerations

7.5 When considering the planning guidance outlined in AVOG, an open window acoustics strategy is likely permissible during periods of overheating for the majority of the Site. For dwellings most exposed to Wrotham Road, further consideration to overheating may be required at the Reserved Matters stage, or as part of other Building Control matters.

Summary

7.6 In summary, based upon the assessment presented within this report, the Site is deemed suitable for residential development from an acoustics perspective.

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APPENDICES

APPENDIX A

Barn
Evenden House
THE PIPPINS
Hurstmere
Cleeve Ho
Shamwood
Kintyre
Greenthorne
Lhaago Lodge
Chimney Court
STRAND CLOSE
St Paul's RC Church
TCB
Adams
CEDAR CLOSE
POPLAR WALK
Homemead
Wigmore House
Epmarket
Bernamy
BEECHWAY
Beech Tree Cottage
The Beeches
Mandhara
The Laurels
St Briavels
Camer Cottage
Galini
The Cherries
Orchid House
El Sub Sta
Pine Trees
The Sheiling
Tel Ex
Dean Park Lodge
Corner Ways
Churchway Wood
MULBERRY CLOSE
LILAC PLACE
DORMERS DRIVE
Holts Shaw
GREEN LANE
Olive Shaw
Priestfield Shaw
AZZI
St David's
Shirley
Mavron House
Glenmore
Shearwater
Inglewood
Oaklynn
Katary
Holly House
St Catherine
Camer-Lea
Betchwpth
Earrach
Parkview
HUNTINGFIELD ROAD
LANKES CLOSE
Car Park
SCHOOL CLOSE
The Parade
Watmough House
El Sub Sta
Meopham Community Primary School
WROTHAM ROAD
North Lodge
The Coach House
North House
Stable Cottage
Trees
The Laurels
The Cedars
St John's Centre
Meopham Court South
Church Cottages
St John The Baptist's Church
Graveyard
South Lodge
Pond
The Glebe
The Rectory
LB
Camer Farm Barn
Stable Cottage
The Great Yard
Bailiff's House
West Lodge
Car Park
PC
Play Area
CAMER PARK ROAD
Foxendown Cottage
Camp Site
El S

KEY

SITE LOCATION
15.84 HECTARES / 39.14 ACRES

OTHER LAND IN OWNERSHIP
9.93 HECTARES / 24.54 ACRES

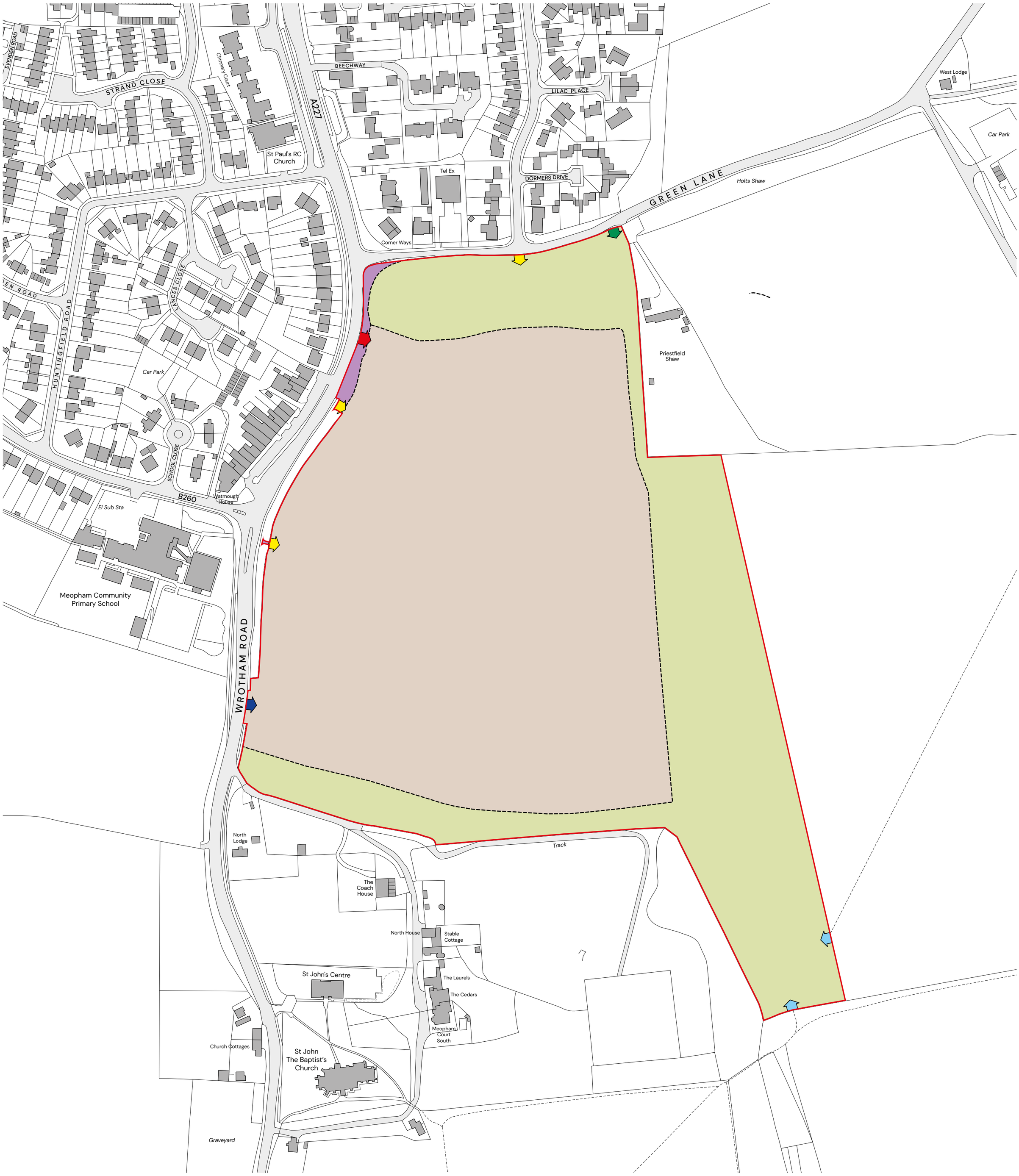
N 0 50 100 m

REV A : RLB UPDATED. 01.09.25 (SB)
REV B : RLB UPDATED. 17.09.25 (RL)

WROTHAM ROAD, MEOPHAM – SITE BOUNDARY

PEGASUS GROUP

PEGASUSGROUP.CO.UK | TEAM/DRAWN BY: RL/SB | APPROVED BY: JW | DATE: 07.07.25 | SCALE: 1:2500@A2 | DRWG: P25-0485_DE_1001_B_1 | CLIENT: RICHBOROUGH |



LEGEND

Site boundary

LAND USE PARAMETERS

- Indicative area of land required for the proposed access, not within the residential land use (subject to detailed design)
- Proposed residential development (Use Class C3) (including roads, footpaths, private drives, amenity and incidental open space and other associated infrastructure, subject to detailed design)
- Proposed open space (including amenity green space, children's play provision, allotments, orchard, landscaping, footpaths, drainage and other associated infrastructure, subject to detailed design)

ACCESS PARAMETERS

- Proposed access/egress for all modes (subject to detailed design)
- Potential access/egress for cyclists and pedestrians only (subject to detailed design)
- Potential access/egress for pedestrians only (subject to detailed design)
- Existing public right of way access retained
- Potential emergency access for emergency vehicles and access/egress for cyclists and pedestrians (subject to detailed design)

Note: All features and areas are subject to detailed design and to a tolerance of 10m.

N

0 100m

REV C: Amended access and red line boundary	19.09.2025 CM
REV B: Amended land use areas	04.09.2025 CM
REV A: Amended access and land use areas	03.09.2025 CM
FIRST ISSUE: For client comment	27.08.2025 CM

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DESIGN | ECONOMICS | ENVIRONMENT | HERITAGE | LAND & PROPERTY | PLANNING | TRANSPORT & INFRASTRUCTURE

WROTHAM ROAD, MEOPHAM | **PARAMETER PLAN**

TEAM/DRAWN BY: CM | APPROVED BY: JW | DATE: 27/08/2025 | SCALE: 1:2000 @ A2 | DRAWING REF: P25-0485_DE_1006 | SHEET: 1 | REV: C | CLIENT: RICHBOROUGH

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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 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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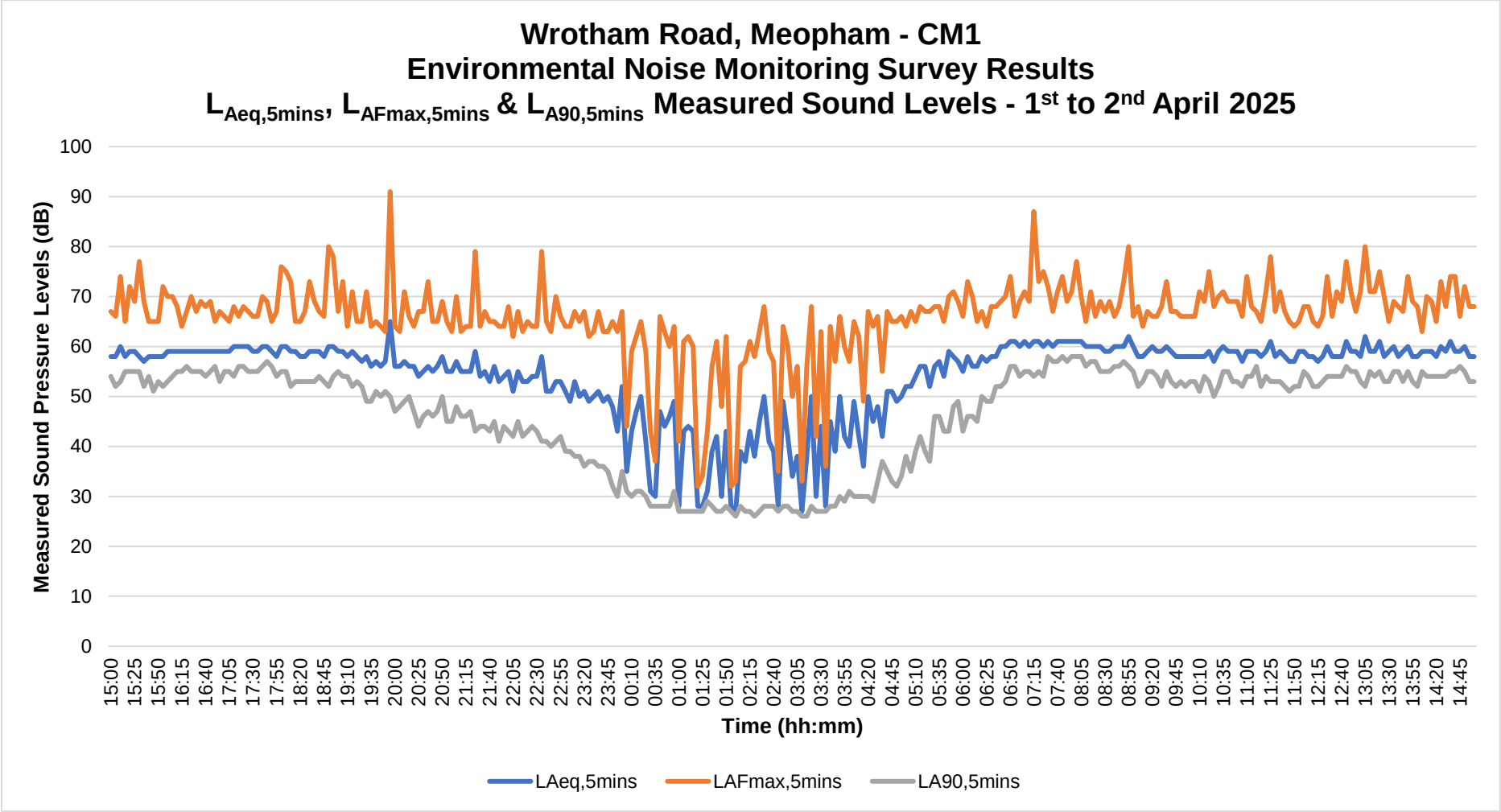
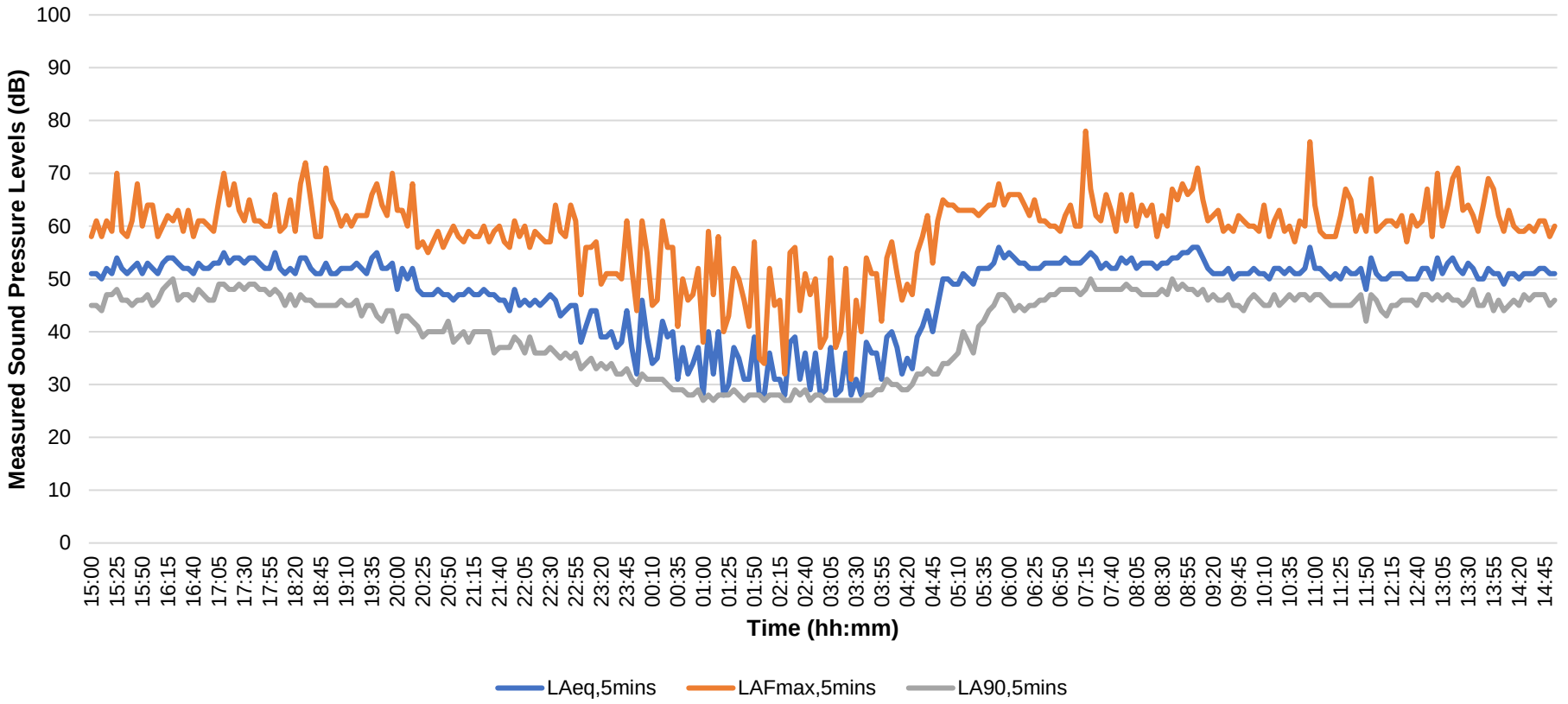
APPENDICES

APPENDIX C


Wrotham Road, Meopham - CM1
Environmental Noise Monitoring Survey Results
LAeq,5mins, LAFmax,5mins & LA90,5mins Measured Sound Levels - 1st to 2nd April 2025
Measured Sound Pressure Levels (dB)
100
90
80
70
60
50
40
30
20
10
0
15:00
15:25
15:50
16:15
16:40
17:05
17:30
17:55
18:20
18:45
19:10
19:35
20:00
20:25
20:50
21:15
21:40
22:05
22:30
22:55
23:20
23:45
00:10
00:35
01:00
01:25
01:50
02:15
02:40
03:05
03:30
03:55
04:20
04:45
05:10
05:35
06:00
06:25
06:50
07:15
07:40
08:05
08:30
08:55
09:20
09:45
10:10
10:35
11:00
11:25
11:50
12:15
12:40
13:05
13:30
13:55
14:20
14:45
Time (hh:mm)
LAeq,5mins
LAFmax,5mins
LA90,5mins

Wrotham Road, Meopham - CM2
Environmental Noise Monitoring Survey Results
$L_{Aeq,5mins}$, $L_{AFmax,5mins}$ & $L_{A90,5mins}$ Measured Sound Levels - 1st to 2nd April 2025



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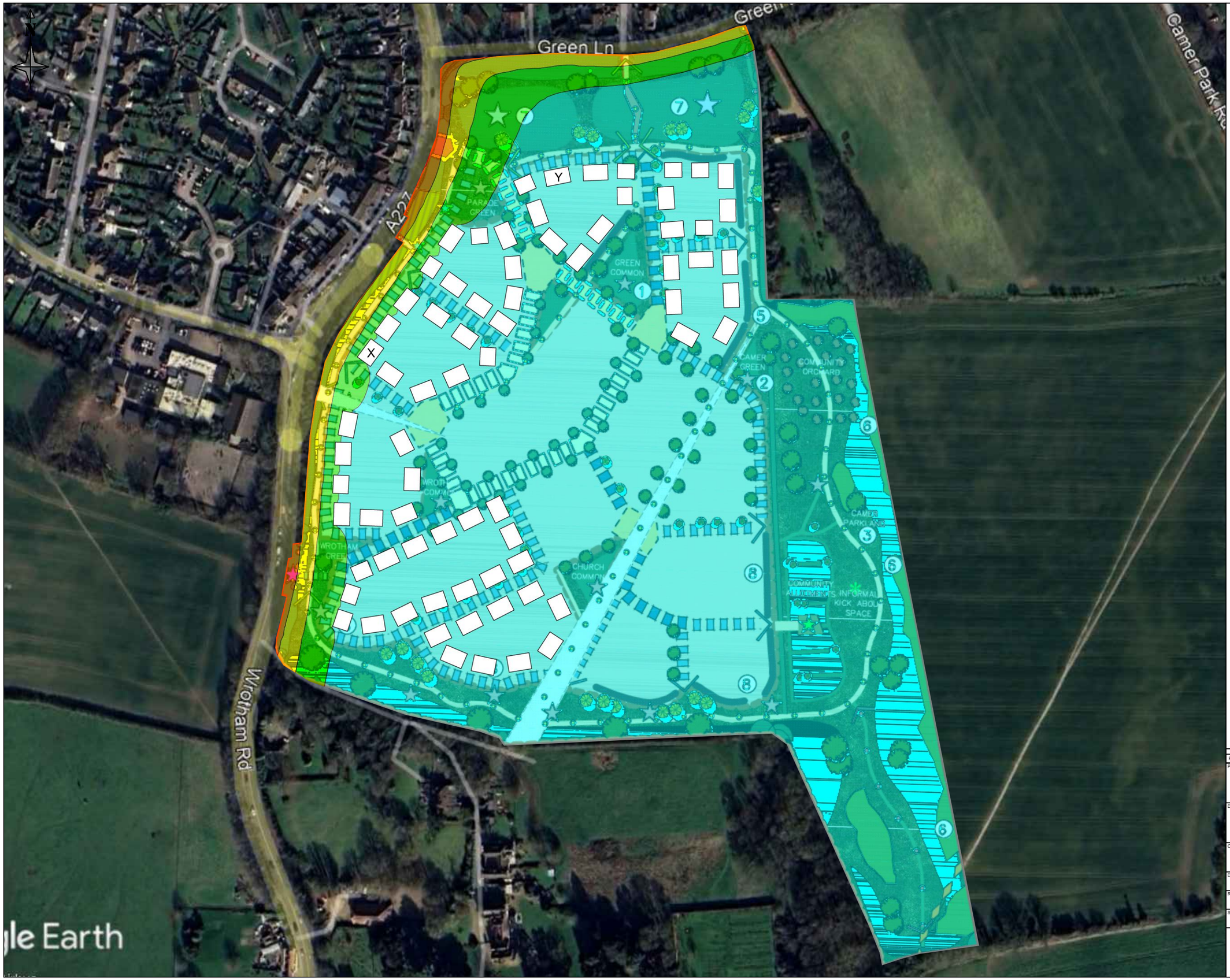
APPENDICES

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)

REV:	AMENDMENTS:	DRN:	CHK:	APP:	DATE:
-		CP	EW	NF	01.07.25

PROJECT:
WROTHAM ROAD,
MEOPHAM

DRAWING TITLE:
DAYTIME AMBIENT SOUND LEVELS
LAeq,16hour

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29473_04_120_01

REVISION:	SHEET SIZE:	SCALE:
-	A3	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

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:
-		CP	EW	NF	01.07.25

PROJECT:
WROTHAM ROAD,
MEOPHAM

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

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29473_04_120_02

REVISION:	SHEET SIZE:	SCALE:
-	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.

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:
-		CP	EW	NF	01.07.25

PROJECT:
WROTHAM ROAD,
MEOPHAM

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

CLIENT:
RICHBOROUGH

DRAWING NUMBER:
29473_04_120_03

REVISION:	SHEET SIZE:	SCALE:
-	A3	NFS

STATUS:
FOR INFORMATION / APPROVAL

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APPENDICES

APPENDIX E

Reference A 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 (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.								

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.

- CIVIL ENGINEERING
- TRANSPORT
- FLOOD RISK & DRAINAGE
- STRUCTURES
- GEO-ENVIRONMENTAL
- ACOUSTIC AIR
- UTILITIES
- GEOMATICS
- LIGHTING
- EXPERT WITNESS

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