MEC Consulting Group

ACOUSTIC AIR

# Land north of Barlestone Road, Newbold Verdon

Acoustics Assessment

November 2025

**Report Ref: 29724-ENV-0401 Rev A**

# Land north of Barlestone Road, Newbold Verdon
# Acoustics Assessment
# November 2025

**REPORT REF: 29724-ENV-0401 Rev A**

CLIENT: Wheeldon Brothers 1867 Ltd

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

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

**REGISTRATION OF AMENDMENTS**

| Date | Rev | Comment | Prepared By | Checked By | Approved By |
|---|---|---|---|---|---|
| November 2025 | - | First issue | **Neil S Forsdyke** MIOA Associate Acoustics & Air Quality Consultant | **Harry Johnson** BSc (Hons) AMIOA Senior Acoustics Consultant | **Tim Rose** BA(Hons) MCIHT MTPS Regional Director |
| November 2025 | A | Amended site name | **Neil S Forsdyke** MIOA Associate Acoustics & Air Quality Consultant | **Harry Johnson** BSc (Hons) AMIOA Senior Acoustics Consultant | **Tim Rose** BA(Hons) MCIHT MTPS Regional Director |

## EXECUTIVE SUMMARY

| | |
|---|---|
| **Site Address** | Land north of Barlestone Road, Newbold Verdon. |
| **Site Description and Setting** | The Site, comprised of green field and an existing dwelling, is bound to the north, east and west by further green fields, with existing residential also located adjacent to the eastern boundary, with Newbold Garage and further commercial uses located beyond, and Barlestone Road adjacent to the southern boundary. |
| **Proposed Development** | Development proposals comprise the erection of residential dwellings and associated infrastructure, with access via Barlestone Road |
| **Assessment** | External Sound Levels<br>Environmental sound surveys and acoustic modelling demonstrated that road traffic noise from Barlestone Road presents a medium risk to the development under ProPG guidance. However, for indicative dwellings based on the masterplan, predicted external noise levels across all garden areas fall below the BS 8233's lower-level criterion of 50 dB $L_{Aeq,16hr}$, through the provision of standard 1.8m high close boarded timber fencing.<br>Internal Sound Levels<br>With regards to internal acoustic conditions, the majority of new dwellings will satisfy the criteria in BS 8233 and ProPG through the provision of standard thermal double glazing and direct airpath window mounted trickle ventilators to achieve the whole-dwelling ventilation requirements of AD-F, with uprated acoustic glazing and trickle ventilators required for the most exposed plots overlooking Barlestone Road. |
| **Conclusions** | It is considered that with the implementation of the recommended mitigation strategy, the Site is suitable for residential development. |
| **Recommendations** | • New dwellings to face Barlestone Road, with private garden areas used for amenity located behind.<br>• Standard 1.8m high close boarded timber fencing for any garden area with a direct, or partial in-direct line of sight to Barlestone Road.<br>• Ensure façade construction meets the minimum performance requirements outlined in the report. |
| **This summary should be read in conjunction with the full report and reflects an assessment of the site based on information received by MEC at the time of production.** | |

**CONTENTS**



**APPENDICES**

## 1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Wheeldon Brothers 1867 Ltd to undertake an Acoustics Assessment for a proposed residential development on Land north of Barlestone Road, Newbold Verdon (hereafter referred to as 'the Site').

### Existing Site

1.2 The Site, comprised of green field and an existing dwelling, is bound to the north, east and west by further green fields, with existing residential also located adjacent to the eastern boundary, with Newbold Garage and further commercial uses located beyond, and Barlestone Road adjacent to the southern boundary.

1.3 The principal sources of noise affecting the Site will be from local road traffic using Barlestone Road, coupled with any contributions from Newbold Garage and the commercial uses to the east.

1.4 An approximate redline boundary is presented in Figure 1.1.

**Figure 1.1: Approximate Redline Boundary**


### Development Proposals

1.5 Development proposals comprise the erection of residential dwellings and associated infrastructure, with access via Barlestone Road.

1.6 An illustrative masterplan is provided in **Appendix A**.

**Assessment Scope**

1.7 The following scope of works has been undertaken:

- An environmental sound survey has been undertaken within the Site in order to determine the prevailing acoustic conditions;
- An acoustic model has been created in order to predict sound levels across the Site for comparison against relevant criteria contained within ProPG[1], the British Standard BS 8233[2], and AVOG[3]; 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 Local Planning Authority that internal acoustic conditions will be compliant with the relevant British Standards and Acoustics Guidance.

**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] 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.

## 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 Overheating and Ventilation 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[4] 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.

[4] BS 4142:2014 +A1:2019 *'Methods for rating and assessing industrial and commercial sound.'*

2.8 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.

2.9 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 2 minutes 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*

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

*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 Thursday 14th and Friday 15th July 2025 to monitor noise emanating from road traffic on Barlestone Road; and commercial sources to the east. The survey was undertaken in full accordance with the guidance set out in BS 7445[6].

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

- Continuous Measurement 1 (CM1): on the southern boundary of the Site, approximately 6m from the carriageway edge of Barlestone Road;
- Continuous Measurement 2 (CM2): along the eastern boundary, approximately 50m from Newbold Garage to the east.

3.3 A monitoring location plan is provided 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.

[6] 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 | Type NOR140 | 1407932 | 22/02/2027 |
| | Pre-Amplifier | Type 1209 | 23695 | |
| | Microphone | Type 1225 | 505583 | |
| | Calibrator | Norsonic 1251 | 34315 | 07/04/2026 |
| CM2 | Sound Level Meter | Type NOR140 | 1407773 | 23/03/2027 |
| | Pre-Amplifier | Type 1209 | 23168 | |
| | Microphone | Type 1225 | 413180 | |
| | Calibrator | Norsonic 1255 | 125525772 | 18/11/2025 |

**Meteorological Conditions**

3.6 During setup of the SLMs, weather conditions were overcast and dry, with warm temperatures and light south-westerly winds averaging 0.4 m/s. At the time of collection, conditions were wet and drizzly, cooler in temperature, with south-westerly winds at 1.1 m/s.

3.7 It is considered that there were no adverse weather conditions that would likely have affected the survey outcomes.

**Observations**

3.8 Whilst on Site, it was observed that the primary continuous source of noise in the area is road traffic on Barlestone Road. Traffic flow was considered to be relatively consistent, with vehicles passing at medium speeds. The road carries a low proportion of heavy goods vehicles (HGVs) and is subject to a 40-mph speed limit.

3.9 At CM2, Barlestone Road remained the dominant source of noise, and there was no audible contributions from any operations associated Newbold Garage or the commercial uses, and certainly no dominant noise that would warrant assessment under BS 4142. Nevertheless, further analysis of the audio recordings has been undertaken, which shows that road traffic from Barlaston Road remained the dominant source of noise throughout the measurement period and consequently, no further consideration to Newbold Garage or the commercial uses has been given.

**Results**

3.10 Time history graphs for the continuous measurement positions are provided in **Appendix C**.

3.11 Table 3.2 and Table 3.3 provide summaries 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)] $L_{AFmax,2min}$ |
| July 14th | 65[(b)] | 58 | 78 |
| July 15th | 66[(c)] | - | - |
| [(a)] Maximum noise level not exceeded more than 10 times per night.<br>[(b)] T = 8hr<br>[(c)] T = 8hr | | | |

3.12 At CM1, the derived daytime $L_{Aeq,16hr}$ was 66 dB (rounding to the nearest whole number for assessment purposes), while the measured night-time $L_{Aeq,8hr}$ was 58 dB.

3.13 Analysis of the night-time $L_{AFmax,2min}$ levels shows that the individual events did not exceed 78 dB more than 10 times during the measured night-time period. Analysis of the audio recordings show that all events above 78 dB were caused by vehicular 'pass-bys', with no significant low frequency spectral content. Therefore, a value of 78 dB $L_{AFmax,2min}$ is considered appropriate value 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)] $L_{AFmax,5min}$ |
| July 14th | 55[(b)] | 47 | 64 |
| July 15th | 55[(c)] | - | - |
| [(a)] Maximum noise level not exceeded more than 10 times per night.<br>[(b)] T = 7.5hr<br>[(c)] T = 8.5hr | | | |

3.14 At CM2, the derived daytime $L_{Aeq,16hr}$ was 55 dB, while the measured night-time $L_{Aeq,8hr}$ was 47 dB.

3.15 Analysis of the night-time $L_{AFmax,5min}$ levels shows that the individual events did not exceed 64 dB more than 10 times during the measured night-time period. Analysis of the audio recordings show that all events above 64 dB were caused by vehicular 'pass-bys', with no significant low frequency spectral content.

## 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[7].

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

- Digital Terrain Model – Lidar 1m (Environment Agency, downloaded on 5th August 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 |
|---|---|
| Daytime Ambient $L_{Aeq,16hr}$ | 66 |
| Night-time Ambient $L_{Aeq,8hr}$ | 58 |
| Night-time Maximum $L_{AFmax,2min}$ | 78 |

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

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

## 5.0 ACOUSTICS ASSESSMENT

5.1 For conciseness, this report tabulates the most exposed indicative receptor based on the illustrative masterplan; as Plot X overlooking Barlestone Road, 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.

### 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 |
| Pro PG Threshold | < 50 | < 40 | 50 – 60 | 40 – 50 | 60 – 70 | 50 – 60 | > 70 | > 60 |
| Plot X | | | 57 | | | 51 | | |
| Risk Assessment | | | Low | | | Medium | | |

5.3 Based on the modelled sound levels, the most exposed receptor overlooking Barlestone Road falls within the ProPG risk category of 'Low' risk during the daytime, for which the guidance states that development is *"likely to be acceptable from a noise perspective, provided that a good acoustic design process is followed."*

5.4 The Site increases to 'Medium' risk during the night-time, for which the guidance requires that *"the Site should follow a good acoustic design process which confirms how the adverse impacts of noise will be mitigated and minimised."*

5.5 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 acoustics 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 29724_04_120_01 presented in **Appendix D**, indicates that based on the illustrative masterplan, 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 for the most exposed garden areas to Barlestone Road.

### BS 8233 Internal Acoustic Criteria

5.8 Table 5.2 presents the required external to internal reduction requirements for the most exposed dwellings to Barlestone Road.

**Table 5.2: Required Façade Performance, dB**

| Plot | Parameter | External Level | Internal Criteria | Required Reduction |
|---|---|---|---|---|
| X | Daytime Ambient $L_{Aeq,16hr}$ | 57 | 35 | 22 |
| | Night-time Ambient $L_{Aeq,8hr}$ | 51 | 30 | 21 |
| | Night-time Maximum $L_{AFmax,2min}$ | 71 | 45 | 26 |

5.9 For the most exposed dwellings, the results in Table 5.2 show that a sound reduction of up to 22 dB will be required to achieve the internal $L_{Aeq,16hr}$ criterion during the daytime, with a sound reduction of up to 26 dB required to achieve the $L_{AFmax}$ criterion for new receptors during the night-time.

**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? |
|---|---|---|---|---|
| X | Daytime Ambient $L_{Aeq,16hr}$ | 57 | Low | Optional |
| | Night-time Ambient $L_{Aeq,8hr}$ | 51 | Low | Optional |

5.12 The results demonstrate that at the most exposed receptors, an AVOG Level 2 assessment is optional due to the low sound levels.

5.13 However, it should be noted that the maximum levels will drive the acoustic design for new dwellings overlooking Barlestone Road. Therefore, further consideration to the maximum night-time criteria presented within AD-O[8], will need to be given during the Reserved Matters or Building Control process.

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

## 6.0 MITIGATION

### External Sound Levels

6.1 Based on the illustrative masterplan, 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 for the most exposed garden areas to Barlestone Road.

### Internal Sound Levels

6.2 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.

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.

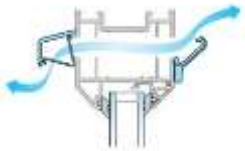
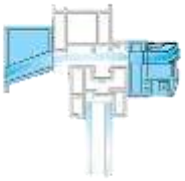
6.4 Drawing on the above, and the acoustic modelling undertaken, Table 6.1 provides typical reduction requirements and potential glazing and ventilation solutions across the Site in order to demonstrate compliance with the internal sound level criteria outlined in BS 8233, ProPG, and the ventilation requirements of AD-F[9].

6.5 This table should be read in conjunction with the drawings in **Appendix E** whereby drawing 29724_04_120_04 demonstrates the required reduction for bedrooms and drawing 29724_04_120_05 demonstrates the required reduction for all other habitable rooms.

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**.

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

**Table 6.1: Suggested Internal Mitigation Measures**

| Mitigation Ref. | Example Glazing Solution | Example Whole-Dwelling Ventilation Solution (AD-F) |
|---|---|---|
| Ref. A | 4mm glass panel<br>12mm air gap<br>4mm glass panel<br><br>Approx. 27 dB $R_w + C_{tr}$ | Standard Non-Acoustic Trickle Vent<br>Direct airpath trickle vent located in the top of the window frame<br>  <br>Approx. $D_{n,e,w} + C_{tr}$ = 32 dB |
| Ref: B | 8mm pane<br>12mm air space<br>10mm pane<br><br>Approx. $R_w + C_{tr}$ = 33 dB | Acoustically Rated Trickle Vent<br>Slots typically located in the window frame with more torturous path and acoustic lining<br>  <br>Approx. $D_{n,e,w} + C_{tr}$ = 36 dB |

## 7.0 CONCLUSIONS

7.1 MEC has been commissioned by Wheeldon Brothers 1867 Ltd to undertake an Acoustic Assessment for a proposed residential development on Land north of Barlestone Road, Newbold Verdon.

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, based on the illustrative masterplan, 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 for the most exposed garden areas to Barlestone Road.

**Internal Sound Levels**

7.4 With regards to internal acoustic conditions, the majority of new dwellings will satisfy the criteria in BS 8233 and ProPG through the provision of standard thermal double glazing and direct airpath window mounted trickle ventilators to achieve the whole-dwelling ventilation requirements of AD-F, with uprated acoustic glazing and trickle ventilators required for the most exposed plots overlooking Barlestone Road.

7.5 When considering the planning guidance outlined in AVOG, an open window acoustics strategy is likely to be permissible during periods of overheating. However, maximum levels will drive the acoustic design for new dwellings overlooking Barlestone Road during the night-time and therefore, further investigations will be required as part of any Reserved Matters application, during the detailed design phase. In any event, the application should not be delayed on these grounds, as it needs to be recognised that the overheating strategy will be determined under AD-O at Building Control stage.

**Summary**

7.6 In conclusion, it is considered that with the implementation of the recommended mitigation strategy, the Site is suitable for residential development.

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# APPENDICES

Appendix A


0 10 20 metres

N

- Site Boundary: **Aprx. 3.0ha**
- Proposed new homes: **Aprx. 1.99ha Up to 67 dwellings @ 33.5dph**
- Tree-lined primary street
- Secondary street
- Lanes & Private drives
- Natural Play Trail features
- Children's Play Space **LAP |** 'Local Area for Play'
- Existing vegetation
- New native tree, thicket and species-rich wildflower planting
- SuDS Basins
- Public Footpaths
- Proposed vehicular/ pedestrian/cycle access
- Potential pedestrian link
- Proposed footway/cycleway
- Proposed drop curb crossing
- Toucan crossing proposed by adjacent appplication (24/01061/OUT)

| Rev | Date | By | Description |
|---|---|---|---|

CSA environmental

Dixies Barns, High Street,
Ashwell, Hertfordshire SG7 5NT

t 01462 743647
e ashwell@csaenvironmental.co.uk
w csaenvironmental.co.uk

| | |
|---|---|
| Project | Land north of Barlestone Road **NEWBOLD VERDON** |
| Drawing Title | Illustrative Masterplan |
| Client | Wheeldon 1867 |
| Scale @ A1 1:500 | Drawing No. 7625_109 |
| Date Oct 2025 | Rev B |
| Drawn DF | Checked RC |

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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 90$^{th}$ 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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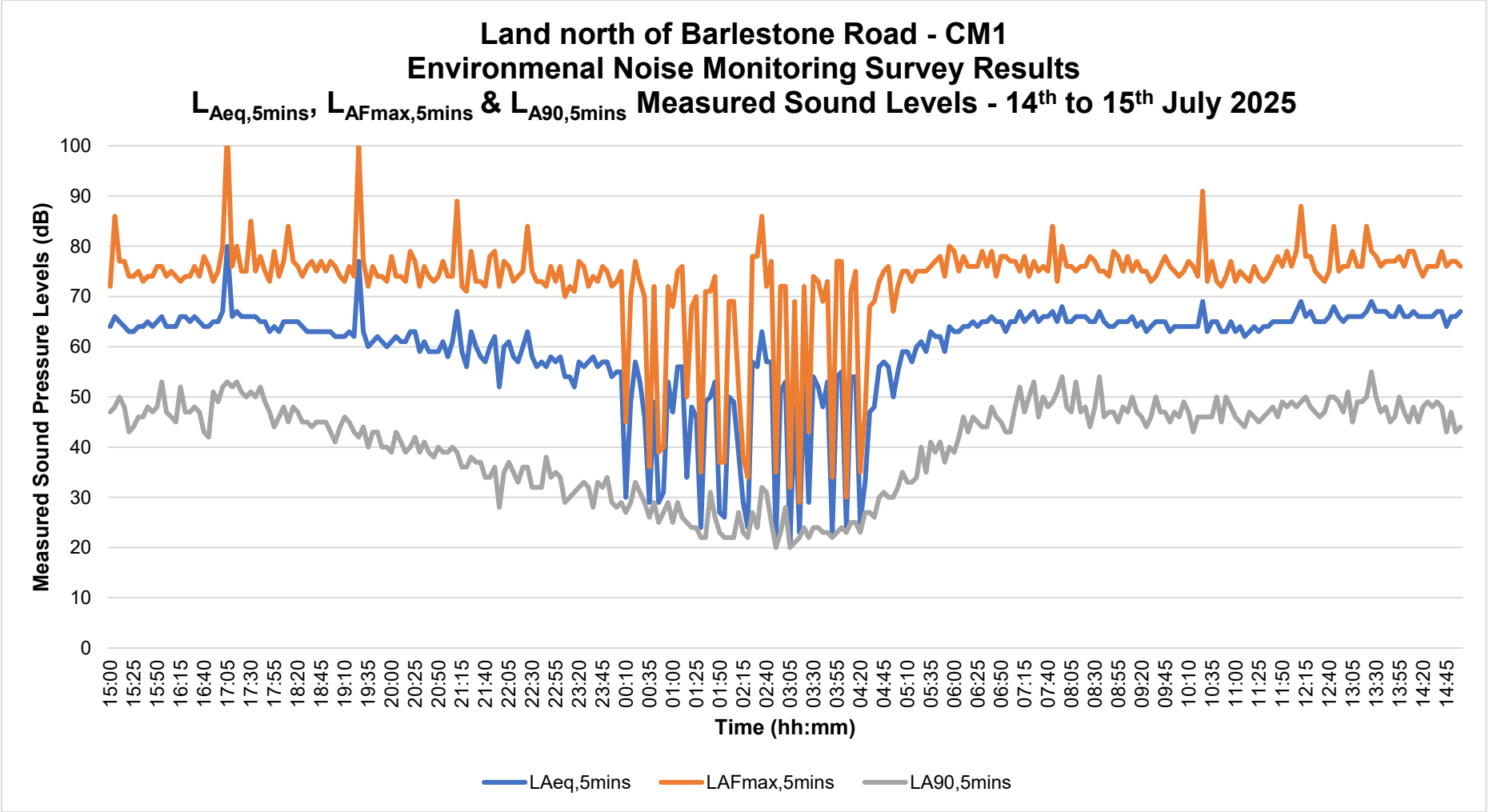
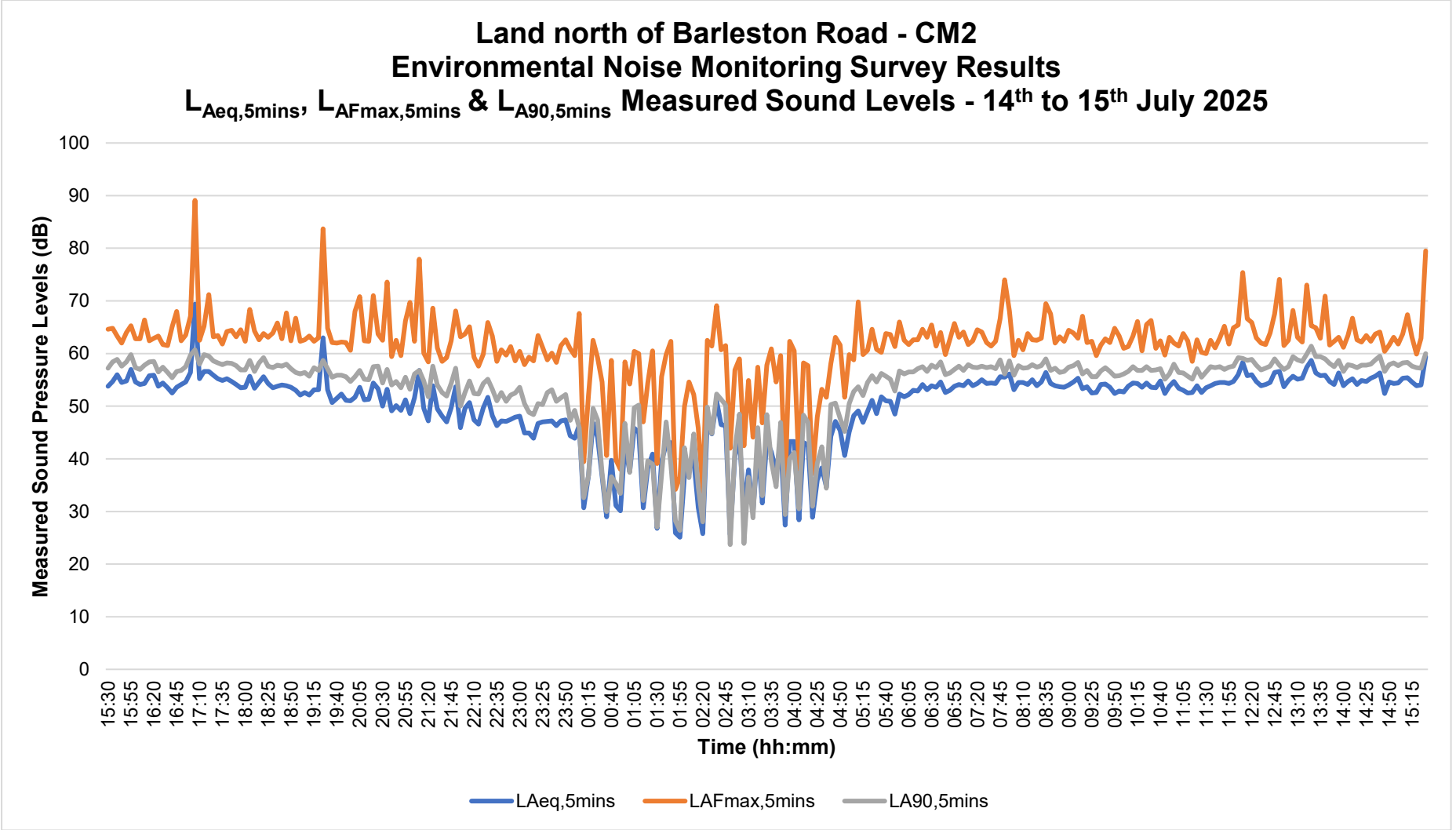
# APPENDICES

Appendix C


Land north of Barlestone Road - CM1
Environmenal Noise Monitoring Survey Results
$L_{Aeq,5mins}$, $L_{AFmax,5mins}$ & $L_{A90,5mins}$ Measured Sound Levels - 14th to 15th July 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


Land north of Barleston Road - CM2
Environmental Noise Monitoring Survey Results
LAeq,5mins, LAFmax,5mins & LA90,5mins Measured Sound Levels - 14th to 15th July 2025
Measured Sound Pressure Levels (dB)
100
90
80
70
60
50
40
30
20
10
0
15:30
15:55
16:20
16:45
17:10
17:35
18:00
18:25
18:50
19:15
19:40
20:05
20:30
20:55
21:20
21:45
22:10
22:35
23:00
23:25
23:50
00:15
00:40
01:05
01:30
01:55
02:20
02:45
03:10
03:35
04:00
04:25
04:50
05:15
05:40
06:05
06:30
06:55
07:20
07:45
08:10
08:35
09:00
09:25
09:50
10:15
10:40
11:05
11:30
11:55
12:20
12:45
13:10
13:35
14:00
14:25
14:50
15:15
Time (hh:mm)
LAeq,5mins
LAFmax,5mins
LA90,5mins

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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: |
|---|---|---|---|---|---|
| - | FIRST ISSUE | CP | EW | NF | 04.11.25 |

PROJECT:
LAND NORTH OF BARLESTONE ROAD, NEWBOLD VERDON

DRAWING TITLE:
DAYTIME AMBIENT SOUND LEVELS LAeq,16hour

CLIENT:
WHEELDON BROTHERS 1867 LTD

DRAWING NUMBER:
29724_04_120_01

| REVISION: | SHEET SIZE: | SCALE: |
|---|---|---|
| - | A3 | NTS |

STATUS:
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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: |
|---|---|---|---|---|---|
| - | FIRST ISSUE | CP | EW | NF | 04.11.25 |

PROJECT:
LAND NORTH OF BARLESTONE ROAD, NEWBOLD VERDON

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

CLIENT:
WHEELDON BROTHERS 1867 LTD

DRAWING NUMBER:
29724_04_120_02

| REVISION: | SHEET SIZE: | SCALE: |
|---|---|---|
| - | A3 | NTS |

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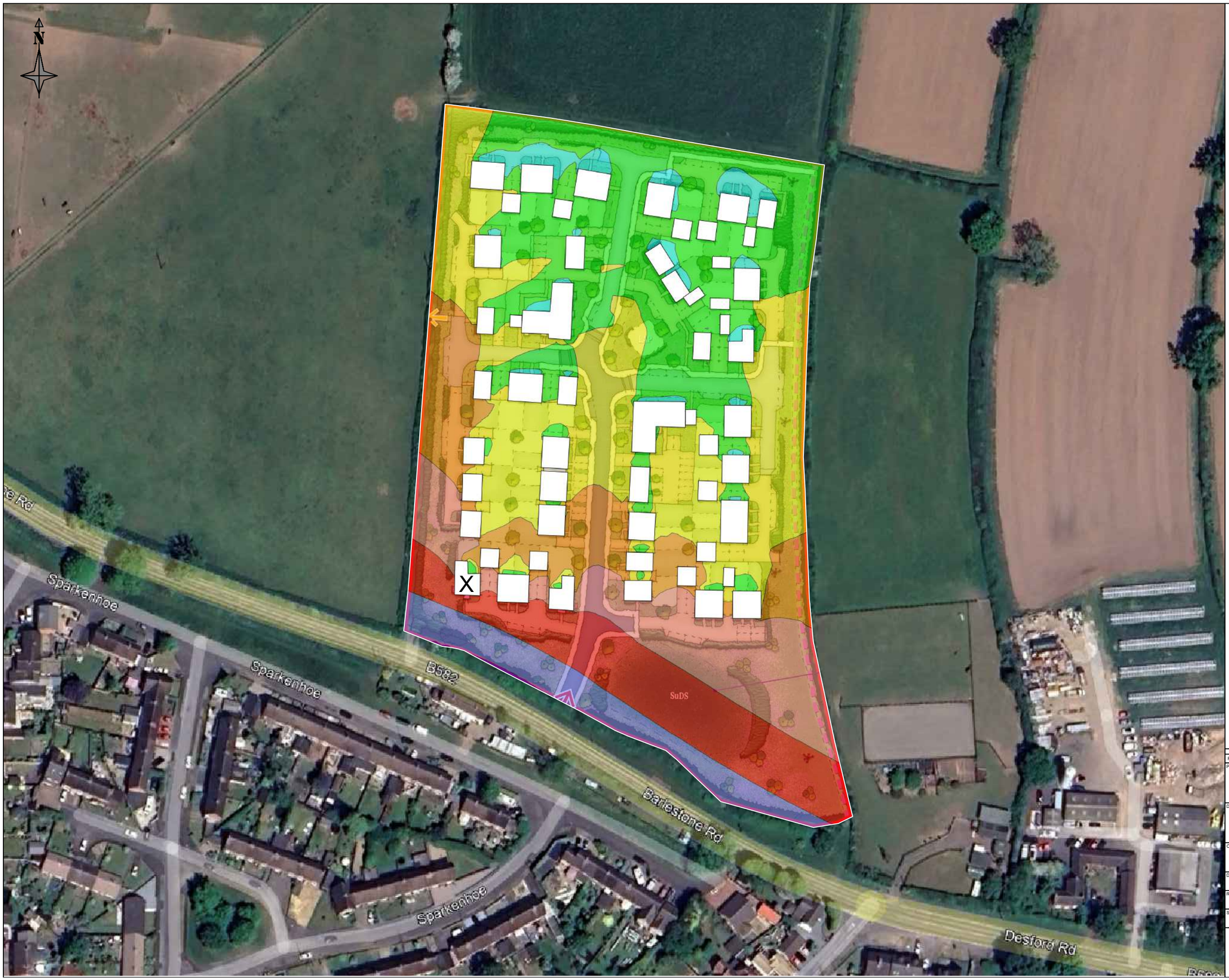


NOTES:

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: |
|---|---|---|---|---|---|
| - | FIRST ISSUE | CP | EW | NF | 04.11.25 |

PROJECT:
LAND NORTH OF BARLESTONE ROAD, NEWBOLD VERDON

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

CLIENT:
WHEELDON BROTHERS 1867 LTD

DRAWING NUMBER:
29724_04_120_03

| REVISION: | SHEET SIZE: | SCALE: |
|---|---|---|
| - | A3 | NTS |

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# APPENDICES

Appendix E


NOTES:

1. DO NOT SCALE THIS DRAWING.
2. PLEASE REFER TO REPORT REFERENCE 29724-ENV-0401 FOR DETAILS ON THE PROPOSED GLAZING AND VENTILATION REFERENCES.

KEY

Ref. A

Ref. B

| REV: | AMENDMENTS: | DRN: | CHK: | APP: | DATE: |
|---|---|---|---|---|---|
| - | FIRST ISSUE. | CP | EW | NF | 04.11.25 |

PROJECT:
LAND NORTH OF BARLESTONE ROAD, NEWBOLD VERDON

DRAWING TITLE:
MITIGATION REFERENCE FOR ALL HABITABLE BEDROOMS

CLIENT:
WHEELDON BROTHERS 1867 LTD

DRAWING NUMBER:
29724_04_120_04

| REVISION: | SHEET SIZE: | SCALE: |
|---|---|---|
| - | A3 | NTS |

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NOTES:

1. DO NOT SCALE THIS DRAWING.
2. PLEASE REFER TO REPORT REFERENCE 29724-ENV-0401 FOR DETAILS ON THE PROPOSED GLAZING AND VENTILATION REFERENCES.

KEY

Ref. A

| REV: | AMENDMENTS: | DRN: | CHK: | APP: | DATE: |
|---|---|---|---|---|---|
| - | FIRST ISSUE. | CP | EW | NF | 04.11.25 |

PROJECT:
LAND NORTH OF BARLESTONE ROAD, NEWBOLD VERDON

DRAWING TITLE:
MITIGATION REFERENCE FOR ALL OTHER HABITABLE ROOMS

CLIENT:
WHEELDON BROTHERS 1867 LTD

DRAWING NUMBER:
29724_04_120_05

| REVISION: | SHEET SIZE: | SCALE: |
|---|---|---|
| - | A3 | NTS |

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# APPENDICES

Appendix F

**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.<br>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)** | 40 | 38 | 30 | 49 | 52 | 48 | 40 | -4 |
| The glazing reduction requirements can typically be found in a configuration of 8/12/10.<br>The background ventilation requirements can be found in standard 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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- GEOMATICS
- LIGHTING
- EXPERT WITNESS