

MELKSHAM ROAD, HOLT - NOISE IMPACT ASSESSMENT

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REPORT

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1 INTRODUCTION

1.1 Melksham Road, Holt

1.1.1 The RPS Acoustics Team (RPS) has been commissioned by Bewley Homes PLC to undertake a noise assessment to accompany an application to discharge the planning condition for the proposed residential development at Melksham Road, Holt, Trowbridge. The proposed development is bounded by Melksham Road to the north, Great Parks and the houses thereon to the west and fields to the south and east. The site lies within the administrative boundary of Wiltshire Council (WiltC).

1.1.2 The proposed development was granted planning permission at appeal (Appeal Reference – APP/Y3940/W/23/3315432) with conditions. A noise impact assessment for the development was prepared by Wardell Armstrong LLP (WA) dated March 2022 (Document Reference – GM12008). A copy of this document can be found in Appendix C and is subsequently referred to throughout this report as 'WA report'.

1.1.3 Condition 6 of the Appeal Decision states:

'An Acoustic Report addressing potential noise for future residents, together with a scheme for protecting the future residents from any invasive noise shall be submitted to the local planning authority for approval with or before the submission of reserved matters. No development shall commence until that report and scheme have been approved in writing by the local planning authority, and prior to the first occupation of any dwelling, all works that form part of the scheme for protecting future residents from any invasive noise shall be completed and thereafter retained.'

1.1.4 A noise impact assessment report, dated 24th May 2024, was prepared by RPS and submitted to WiltC to accompany an application to discharge Condition 6. Further to the submission of the application, the following comments were received from WiltC:

'...'

The key words here [Condition 6] are 'any invasive noise' because I have reviewed the report and it makes no mention whatsoever of the West Wilts Equestrian Centre which sits to the East of the site. Indeed, it states:

'The proposed development is bound by Melksham Road to the north, Great Parks and the houses thereon to the west and fields to the south and east'

However, on inspection its [sic] clear that the fields directly to the east and also to the south are used for equestrian events, specifically cross country eventing and that a number of loudspeakers are present in both of the fields in order to provide commentary for spectators and for safety announcements for riders and spectators. This will clearly produce noise that is potentially invasive to the residents of the houses proposed and it will need to be assessed (frequency, volume, impact). I am also unclear as to whether the main centre itself will produce any significant noise; there is an indoor arena and outdoor show-jumping area plus practice areas. Until this has been assessed and included in the report I cannot provide further comment.'

1.1.5 This report details the noise impact assessment undertaken to satisfy the requirements of Condition 6, and to address the concerns raised by WiltC.

1.1.6 RPS is a member of the Association of Noise Consultants (ANC), the representative body for acoustics consultancies, having demonstrated the necessary professional and technical competence. The assessment has been undertaken with integrity, objectivity, and honesty in accordance with the Code of Conduct of the Institute of Acoustics (IOA) and ethically, professionally, and lawfully in accordance with the Code of Ethics of the ANC.

1.1.7 The technical content of this assessment has been provided by RPS personnel, all of whom are corporate (MIOA) or associate (AMIOA) members of the IOA, the UK's professional body for those working in acoustics, noise and vibration. Personnel and individual qualifications are provided in the Document Status Table at the start of this report. This report has been peer reviewed within the RPS team to ensure that it is technically robust and meets the requirements of our Integrated Management System.

2 ASSESSMENT METHODOLOGY & CONSULTATION

2.1 Consultation

- 2.1.1 Following the submission to WiltC of a noise impact assessment dated 24th May 2024 prepared by RPS to accompany an application to discharge Condition 6, comments were received from the Environmental Health Officer at WiltC.
- 2.1.2 These comments have been re-iterated in Section 1, above, and concern the assessment of noise from the adjacent equestrian centre. These comments have been addressed herein, as well as the assessment of road traffic noise, which has been replicated from the earlier (version 1) report.
- 2.1.3 In addition, on the 20th November 2024 WiltC raised further concerns regarding the potential noise emissions from the sewage pumping station, as stated below;

‘ ...

I have discussed this with the public protection officer and he has confirmed that the relationship of the proposed sewage pumping station to both the existing properties on Great Parks and to proposed plots 68 and 69 of the development does raise some concerns in respect of amenity. We have no noise data for the station, nor do we have any detail of its specification and odour control engineering. He has suggested that either the position is relocated to the east and then as close to the site boundary as possible (in order to minimise the potential for impact on amenity to future/existing residents) or that we require more information in respect of both potential noise and odour impact order to determine the reserved matters application. It is suggested that this needs to be submitted prior to the determination of the current application.

...’

- 2.1.4 Therefore, this report addresses the concerns of WiltC in terms of road traffic noise, noise from West Wilts Equestrian Centre, and noise from the proposed sewage pumping station

2.2 Policy & Guidance

- 2.2.1 The planning condition does not state specific technical guidance to be used in the assessment of noise, only that future residents should be protected from intrusive noise. Noise from road traffic and the equestrian centre have been identified as the main sources of intrusive noise. In addition, the pumping station is considered to be an industrial noise source.
- 2.2.2 Therefore, the following guidance have been utilised in this assessment.
- British Standard 8233:2014: Guidance on sound insulation and noise reduction for buildings, (BS8233).
 - British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS4142).
- 2.2.3 The guidance BS4142 specifically excludes noise from public address (PA) systems and has therefore not been used for the assessment of noise from the PA system associated with the equestrian centre.
- 2.2.4 Full details of the guidance used in the report are provided in Appendix B.

2.3 Site Description

- 2.3.1 The site is located to the north-east of the village of Holt, directly adjacent to Great Parks. Melksham Road lies adjacent to its northern boundary. To the east lies open fields and West Wilts Equestrian Centre (WVEC), which is 200m to the east of the site. The remainder of the site is surrounded by fields. The wider surrounding area consists mainly of rural fields and farmland, and residential dwellings.
- 2.3.2 A review of social media and online resources has identified that WVEC holds regular equestrian events on the fields surrounding (and including) the proposed site. It is therefore reasonable to

assume that the fields surrounding the site could continue to be used for equestrian events following the construction of the development.

2.3.3 The proposed development comprises of circa. 90 residential dwellings. There are also garages, bin and cycle stores, and a new internal road network to serve future residents of the development.

2.3.4 The nearest noise source to the proposed development is the road traffic on Melksham Road directly to the north of site. In addition, noise from events at WVEC have the potential to cause disturbance at the proposed dwellings, and the development proposals include a pumping station in the south-eastern part of the site. These noise sources have also been assessed.

2.3.5 A plan showing the development and surrounding area can be seen at Figure 1 in Appendix A.

2.4 Noise Monitoring

2.4.1 This assessment utilises the results of the noise monitoring undertaken by Wardell Armstrong LLP in March 2022. In addition, RPS have carried out noise monitoring and observations during an outdoor equestrian event at WVEC.

2.5 Noise Modelling

2.5.1 The assessment has utilised the calculations from the computer noise model, SoundPLAN version 9.1.

2.5.2 SoundPLAN noise modelling software has been used to calculate the propagation of noise from across the site and has been used to determine the need for any mitigation measures.

2.5.3 The modelling has been carried out in accordance with ISO 9613-2:2024 Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors (ISO9613). The software uses geographical information to create a model of the study area on which to generate noise contours and includes objects that affect the propagation of sound such as buildings and topography.

3 BASELINE NOISE SURVEY

3.1 Introduction

- 3.1.1 This section of the assessment details the identification of the baseline sound levels at the site and presents the methodologies that have been used to establish road traffic noise, noise from WWEC, and the background sound level, respectively.

3.2 Measurement of Road Traffic Noise

- 3.2.1 A baseline noise survey was undertaken by Wardell Armstrong LLP (WA) for the noise assessment report dated March 2022. The baseline survey was undertaken on the 20th and 21st January 2022 to support the assessment presented in the WA report. Day and night-time noise levels were captured at a measurement location on the north-eastern corner of the proposed development site, located roughly 2 m to the south-east of the edge of Melksham Road (5 m from the centre of the road) (ML1).
- 3.2.2 The baseline survey methodology and results have been reviewed by RPS and have been deemed reliable and representative of the noise climate on site. Moreover, the raw data from the surveys has been obtained from WA for use in the modelling and assessments detailed in this report. More details of the January 2022 baseline noise survey can be found in the copy of the WA report located in Appendix C.
- 3.2.3 Table 3.1 below contains the measured day and night-time noise levels from the survey detailed in the WA report. The data obtained at ML1 was measured in broadband levels.

Table 3.1: Survey Results – Road Traffic Noise

Measurement Location	Daytime $L_{Aeq,T}$, dB	Night-time $L_{Aeq,T}$, dB	10 th Highest Night-time $L_{AFmax,T}$, dB
ML1	70	61	83

3.3 Measurement of the Background Noise Level

- 3.3.1 A baseline noise survey was undertaken by Wardell Armstrong LLP (WA) for the noise assessment report dated March 2022. Daytime noise levels obtained at ML1.
- 3.3.2 The measured background sound level at this location is presented in Table 3.2 below.

Table 3.2: Survey Results – Background Sound Level

Measurement Location	Daytime L_{A90} dB	Night-time L_{A90} dB
ML1	40	35

- 3.3.3 These measured levels have been used to define a maximum sound level from the proposed pumping station.

3.4 Measurement of Noise from West Wilts Equestrian Centre

Survey Methodology

- 3.4.1 A baseline noise survey has been undertaken by RPS on 29th October 2024. The noise measurements were undertaken during an outdoor equestrian event at West Wilts Equestrian Centre. The event utilised the outdoor arena, and comprised a show jumping competition. The PA system was used to announce the start and end of each riders session, and the winner of each round.
- 3.4.2 The noise measurements were undertaken using a class 1 sound level meter which was calibrated before and checked after the noise measurements, with no significant drift identified.

3.4.3 The following acoustic metrics were measured:

- L_{Aeq} ;
- L_{AFmax} ;
- L_{AFmin} ;
- L_{AF90} ; and
- L_{AF10} .

3.4.4 The monitoring equipment also allowed for Z and C weightings to be captured.

3.4.5 Noise monitoring was undertaken in the following locations;

- ST1 – In the nearfield of the PA system
- ST2 – 65 m from the PA system.
- ST3 – 4 m to the rear of the PA system.

Measured Levels

3.4.6 The noise measurements included typical use and volume level of the PA system utilised for outdoor events at the equestrian centre.

3.4.7 Our observations and measured levels show that during the significant majority of the time, there is no sound output from the PA system. This is likely to ensure that the rider and horse are not distracted.

3.4.8 The noise levels in Table 3.3 have been measured during an announcement on the PA system.

Table 3.3: Survey Results – Equestrian Event PA Noise

Measurement Location	Measurement Duration	Daytime $L_{Aeq,T}$, dB
ST1	12 s	95
ST2	13 s	68
ST3	12 s	81

3.4.9 These measured levels have been used to prepare the computer noise model, with further details provided in Section 4 below.

4 DETAILS OF THE COMPUTER NOISE MODELLING

4.1 Introduction

- 4.1.1 To calculate sound levels associated with road traffic movements on Melksham Road and from the PA system associated with events at WVEC, a 3D noise model has been built using SoundPLAN v9.1 acoustic modelling software. The input data for the model has been based upon information from the WA report, the client, measured noise levels from WVEC and RPS's experience of other similar projects.
- 4.1.2 The model predicts sound levels under light down-wind conditions based on hemispherical sound propagation with corrections for atmospheric absorption, ground effects, screening, and directivity based on the procedure detailed in ISO 9613.

4.2 Model Inputs

- 4.2.1 Roads have been modelled as line sources within the model, with their placement based on the imported Ordnance Survey data and maps of the surrounding area. Night-time L_{AFmax} events have been modelled as moving point sources.
- 4.2.2 The spectra used in the model were obtained from the WA noise survey data. The survey data was entered into the model sources and then calibrated such that the noise levels measured at the equivalent measurement position match up with the modelled levels. This was undertaken for daytime, night-time and night-time L_{AFmax} noise levels.
- 4.2.3 The on-site noise measurements of the existing PA system have been used to specify the sound power level and sound spectrum of the individual loudspeakers. The speakers have been created in the noise model in locations that are deemed to be representative of a typical event, as discussed with the operator of West Wilts Equestrian Centre (WVEC). The speakers have been positioned 3.5 m from the ground as is typical with a directivity applied in line with that which has been measured from the existing PA system.
- 4.2.4 The sound power emissions used in the noise model are representative of the PA system during an announcement. The announcements which were observed were infrequent and of short duration. The results of the noise modelling are therefore representative of an extremely conservative worst case, as most of the time there is no sound output from the PA system.
- 4.2.5 The placement of the proposed on-site buildings was based on the schematics provided by Bewley Homes PLC.

Other Inputs

- 4.2.6 The following assumptions have been incorporated into the noise model:
- The topography of the site and the surrounding area has been obtained from the Department for Environment, Food and Rural Affairs (Defra) as 1 m LiDAR data;
 - The effect of screening from solid structures (buildings) has been incorporated into the modelling process by importing OS Open Data 'Settlement Area' shapefile data into the model;
 - The garden fences have been modelled as 1.8 m fences aside from the fences around the gardens of property nos. 1 and 36 which have been modelled as 2.5 m high, both with a superficial mass of 15 kgm⁻²; and
 - The ground type in the model has been set to mostly soft ($G = 0.9$).

4.3 Model Results

- 4.3.1 Predictions have been undertaken of noise levels across the development, including those which are incident on the façades of the proposed development due to road traffic sources, and in amenity spaces due to the PA system associated with WVEC during an announcement.

- 4.3.2 Noise levels incident on the façades of the proposed development have been predicted based on the modelling assumptions and methodology detailed above. A summary of these results is contained in Table 4.1 below. The model predicts daytime $L_{Aeq,16hr}$, night-time $L_{Aeq,8hr}$, and the 10th highest night-time $L_{AFmax,5min}$ levels.
- 4.3.3 Details on the results obtained from the road traffic noise modelling can be found on Figures 2, 3, 4 and 7 in Appendix A.

Table 4.1: Model Results – Road Traffic Noise

Noise Index	Range of Day Time $L_{Aeq,16hr}$, dB	Range of Night-Time $L_{Aeq,8hr}$, dB	Range of 10 th Highest Night-Time $L_{AFmax,5min}$, dB
Level	37 – 65	27 – 55	37 – 75

- 4.3.4 The results of the computer noise model has been used to identify any potential noise effects, as well as any noise mitigation measures which may be required.
- 4.3.5 In addition, the results of the noise modelling from the PA system, which is associated with WWEC is shown in Figure 8.

5 ASSESSMENT OF POTENTIAL NOISE IMPACTS

5.1 Introduction

- 5.1.1 This section of the report considers the potential impact of noise from existing road traffic, and from WWEC. This assessment has been undertaken in line with current guidance and to ensure that future residents are not affected by intrusive noise.

5.2 Assessment of Road Traffic Noise

Internal Noise Levels in Living Rooms and Bedrooms

- 5.2.1 As part of the guidance contained in BS 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings', guideline maximum internal noise levels. It is recommended that internal noise levels do not exceed 35 dB $L_{Aeq,16hr}$ during the day and 30 dB $L_{Aeq,8hr}$ at night. It also makes reference to the World Health Organization 'Guidelines on Community Noise' which recommends that there are no more than 10 $L_{AFmax,T}$ events exceeding 45 dB(A) per night.
- 5.2.2 The ANC's Acoustics, Ventilation and Overheating Guide (AVO) contains guidance on acoustic assessments that also take into account ventilation and overheating. This guidance states that a window open for ventilation provides a sound reduction of 13 dB to external noise levels.
- 5.2.3 The result of the modelling shows that some facades have a noise level which exceeds 48dB(A) during the daytime, and 43dB(A) during the night-time. Therefore, some additional façade treatment is required to reduce internal ambient noise levels to within acceptable levels at some locations as a normal façade design with open windows will not be sufficient to control internal ambient noise levels.

External Noise Levels in Amenity Areas

- 5.2.4 BS 8233:2014 also contains guidance on acceptable noise criteria for external amenity areas, such as gardens or patios. This guidance states:

'For traditional external areas that are used for amenity space, such as gardens and patios it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$, which would be acceptable in noisier environments. However, 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'.

- 5.2.5 As can be seen on Figure 7 in Appendix A, all the gardens of the proposed development experience noise levels below the upper guideline value of 55 dB $L_{Aeq,T}$ aside from the gardens of property 1 and property 37 which have some areas slightly above 55 dB $L_{Aeq,T}$ with the proposed walls/fences in place.

5.3 Assessment of Noise from West Wilts Equestrian Centre

- 5.3.1 As is discussed above, the adjacent equestrian centre hold outdoor horse trials on the fields to the east and south of the site. These events are a long-standing part of the operation of WWEC and previously included the development field itself. Subsequently, these outdoor events occurred adjacent to the dwellings on Great Parks to the west of the development site.
- 5.3.2 Discussions with the operator of WWEC identified that the facility wishes to retain these outdoor events, but also works with their neighbours to maintain a good relationship. Subsequently, WWEC have not experienced any noise complaint which was not easily rectified. WWEC wish to maintain this good relationship going forward.

- 5.3.3 These outdoor horse trail events occur up to 12 times during the summer months (June – Sept), and are typically held on a weekend and during the daytime only. The events attract riders and spectators, with a distributed PA system used for rider and safety announcements.
- 5.3.4 The computer noise model has been used to predict the propagation of sound from the PA system during announcements across the development site. As noted above, the announcements typically last between 10 s and 15 s and occur each time a rider starts the session. Therefore, the announcements are not continuous. For the purposes of the noise model, the announcements are assumed to last for 15s, and take place once every 3 minutes.
- 5.3.5 The assessment of noise from PA systems of this type is not well documented, and does not sit within standard technical and planning guidance.
- 5.3.6 Therefore, In the absence of other more suitable guidance, it has been agreed with WiltC that noise from the PA system should be assessed against the guidelines noise levels in BS8233.
- 5.3.7 As shown on Figure 8, noise from the PA system is up to 50 dB(A) within the proposed development boundary. However, sound from the PA system is below 35dB(A) in gardens of the proposed dwellings, and meets with the external noise guidelines level for external amenity spaces. Therefore, noise mitigation measures to control noise from the PA system at WWEC in gardens of proposed dwellings is not required.
- 5.3.8 Noise from the PA system has also been predicted at the facades of the proposed dwellings during the daytime period, as shown on Figure 9. As shown on Figure 9, the worst-case PA noise level at the facades of the proposed dwellings is up to 35 dB(A). The internal BS8233 guideline level for living rooms and bedrooms during the daytime is 35 dB(A). When considering noise through an open window, assumed to provide 13 dB attenuation, the sound from the PA system could be up to 22 dB(A) in some dwellings. Therefore, mitigation measures will not be required to control noise from the PA system associated with events at WWEC.

5.4 Proposed Pumping Station

- 5.4.1 The proposed development includes a pumping station in the southern part of the site that has the potential to cause an adverse impact at proposed dwellings. However, experience of similar projects has shown that these pumping stations are typically small and housed in an acoustic enclosure.
- 5.4.2 The pumping station which is proposed for the development will serve the domestic foul wastewater and surface water and will be designed by Pump Design and Services (PDAS) in conjunction with the developer's drainage consultants and forms part of the adoption agreement between adopting water company (i.e. Wessex Water in this instance).
- 5.4.3 Noise and Odour Nuisance will be kept to a minimum by adhering to the design criteria, installation methods and the appropriate maintenance program. Elements of the above which either reduce noise/odour nuisance or mitigate the risk of noise/odour nuisance are given below.
- The pumping station wet well will be located no closer than 15m to habitable buildings to minimize the risk of odour, noise and nuisance in accordance with *Appendix C - Design and Construction Guidance* (DCG).
 - Design of the wet well and sewer inlet arrangement including benching and baffle plate will be in accordance with DCG guidance ensuring satisfactory flow conditions to the pumps.
 - Pumps operate in submerged conditions. Noise levels are greatly reduced when sound travels through the water/air interface. The manufacturer noise test for dry-installed pump resulted in a noise emission <70 dB(A).
 - In any case, noise from the pumping station will be limited to avoid any adverse effect on proposed dwellings. The noise limits are discussed in Section 6 below.
 - During the initial stage of the development great care will be taken to ensure the system is regularly maintained and completed flushed.
 - Pumps will have a maximum motor speed of 1500rpm in accordance with DCG guidance
 - Underground chambers will be fitted with sealed manhole covers

- Appropriate ventilation pipework will be installed in accordance with DCG guidance
- The pumping station will be surrounded by a fence or brick wall, or be partially submerged.

5.4.4 Subsequently, the likelihood of the pump causing an adverse effect is low.

6 NOISE MITIGATION MEASURES

6.1 Introduction

- 6.1.1 This section presents the mitigation measures required to be installed into the proposed dwellings, as per the planning condition, to protect the future residents from any intrusive noise.
- 6.1.2 Potential sources of intrusive noise have been identified as road traffic noise, the occasional events at WWEC, and the proposed pumping station.

6.2 Internal Noise Levels in Living Rooms and Bedrooms

- 6.2.1 To determine the appropriate mitigation measures for dwellings, a noise break-in calculation has been undertaken following the guidance contained in BS 8233:2014. This allows the internal ambient noise level to be predicted based on the noise level incident upon the proposed development, the façade dimensions, and the materials from which it is constructed.
- 6.2.2 It has been assumed that non-bedroom living areas will be 4 x 5 m and bedrooms will be 3 x 4 m. All rooms have been assumed to be 2.5 m high. It has been assumed that non-bedroom living areas will have a reverberation time of 0.8 s and for bedrooms will be 0.5 s.
- 6.2.3 Due to the range of noise levels predicted at the façades of the proposed development, two different façade specifications are proposed: an 'enhanced spec' to control noise levels at the most affected façades; and a 'standard spec' which will be sufficient at controlling noise levels at the less affected façades. The 'standard spec' is split further into two categories, one where open windows can be used to control overheating, and one where they cannot. As such, for this latter category (and for the 'enhanced spec'), some form of passive ventilation is required. These specifications are detailed in Table 6.1 below.

Table 6.1: Façade Mitigation Strategies

Façade Mitigation Strategy	External Wall R_w (dB)	Windows R_w (dB)	Ventilation $D_{n,e,w}$ (dB)	Composite Sound Reduction R_w (dB)
Façade Treatment 1 (Standard Spec, Open windows)	51 ¹	30 ²	N/A	39 – Windows Closed 13 – Windows Open
Façade Treatment 2 (Standard Spec)	51 ¹	30 ²	49 ⁴	42
Façade Treatment 3 (Enhanced Spec)	51 ¹	37 ³	49 ⁴	46

¹Standard brick / block external façade construction (as specified in BS 8233:2014).

²Pilkington 4 / 12 / 4 (4 mm float glass, 12 mm air gap, 4 mm float glass)

³Pilkington 10 / 12 / 6 (10 mm float glass, 12 mm air gap, 6 mm float glass)

⁴Acoustic trickle ventilators (based on manufacturers data for Glidevale Acoustic Fresh 80 dB vent) in open condition. It should be noted that this performance assumes two ventilation openings. Should additional ventilation openings be needed to meet the requirements of Approved Document F, the required acoustic performance in terms of $D_{n,e,w}$ will need to be increased by $10\log(N)$, where N is the number of vents required. For example, if two additional vents are required to provide sufficient equivalent area, the performance of each individual vent will need to be increased by 3 dB.

- 6.2 Figure 5 and Figure 6 in Appendix A shows the requisite façade treatment needed for each façade to reduce internal ambient noise levels to within acceptable levels, for living rooms during the day and bedrooms at night, respectively. If these façade treatments, or equivalent ones, are used on the required façades, then internal noise levels in all premises will be below the internal guideline levels detailed in BS 8233:2014 and any adverse impact due to road traffic noise will be very unlikely.

6.3 Ventilation and Overheating

- 6.3.1 It is a requirement of Building Regulations Part F that the following types of ventilation are provided:
- Whole dwelling ventilation (previously referred to as 'background' ventilation);

- Extract ventilation (in kitchens and bathrooms)'
- Purge ventilation.

The likely acoustic impact of each type of ventilation is discussed in the following sections.

Whole Dwelling Ventilation

- 6.3.2 Passive through-wall ventilators are specified in the façade treatments for some of the façades of the proposed development. These will provide the whole dwelling ventilation required. Those façades without passive through-wall ventilators will get whole dwelling ventilation from open windows.

Extract Ventilation

- 6.3.3 Extract ventilation is required in rooms where most pollutants or water vapour are generally i.e., kitchens (cooker hoods, etc.) and bathrooms (bathroom fans). These spaces are not considered habitable rooms and the method used to provide ventilation is unlikely to reduce the sound insulation of the façade. Therefore, it is unlikely that providing extract ventilation in these spaces will result in adverse noise impacts.

Purge Ventilation

- 6.3.4 Purge ventilation is required to allow rapid removal of pollutants released from occasional activities (e.g., burning toast or when painting) and is normally provided by open windows. It is generally accepted that purge ventilation is only required occasionally and for short periods, so increases in noise level during the purge ventilation condition (i.e., when windows are opened) will not result in adverse impacts.

Overheating

- 6.3.5 The normal method of providing relief from overheating is to open windows. When windows are open to provide thermal comfort, it is likely that internal noise levels will increase. The impact that any increased internal noise levels will have depends on two factors:
- The level of noise inside the dwelling / habitable rooms; and
 - How often windows need to be opened (i.e., how often or long occupants are exposed to increased noise levels).
- 6.3.6 To minimise any adverse noise impacts the development, where possible, should be designed to reduce the duration of and how often overheating occurs when windows are shut. This will in turn reduce adverse noise effects as occupants will be exposed to increased noise levels for a shorter period of time.
- 6.3.7 This has been considered as part of an assessment in line with the Acoustics, Ventilation & Overheating (AVO) guide detailed below.

6.4 Acoustics, Ventilation & Overheating (AVO) Assessment

- 6.4.1 A Level 1 AVO Assessment has been carried out in accordance with the guidance detailed in Appendix B. This assessment takes into consideration the worst-case day and night-time predicted external noise levels as detailed in Table 4.1. The outcomes of this assessment have then been compared against the AVO Level 1 Risk Assessment Tool in Table 8.1 in Appendix B.
- 6.4.2 Based on the analysis detailed above, the worst affected façades will experience noise levels that place them in the 'high' risk category for adverse noise impacts if open windows are relied upon to control overheating.
- 6.4.3 As such, it is advised that a TM59 assessment be carried out to assess the risks of overheating. The results will inform a subsequent Level 2 AVO Assessment to assess the potential risks of adverse impacts due to noise based on the frequency and duration of the overheating condition.

- 6.4.4 Overheating is now covered by the Building Regulations Approved Document O (ADO). This includes a requirement for suitable residential amenity to be maintained whilst excess heat is removed and includes noise thresholds for bedrooms at night where open windows cannot be used to avoid overheating. It is considered unlikely that occupants will be subject to significant adverse noise impacts if the requirements of ADO are achieved.

6.5 External Noise Levels in Amenity Areas

- 6.5.1 The mitigation required for the proposed external amenity areas comprises of 1.8 m high close boarded fences for the first row of dwellings, which are closest to Melksham Road, and brick walls around the gardens of Plots 1 and 37.
- 6.5.2 With these mitigation measures in place, the guidelines noise level of 55dB(A) is met in garden areas of all proposed dwellings, with the exception of Plots 1 & 37, where the sound level is between 57 and 55dB(A).
- 6.5.3 BS8233 acknowledges that the guideline level of 55dB(A) may not be achievable in all circumstances. Furthermore, it is very unlikely that an exceedance of the guideline level by up to 2dB would cause an adverse effect on the future residents, nor is the sound in gardens of plots 1 & 37 likely to be noticeably higher than those of adjoining plots.
- 6.5.4 Therefore, this slight exceedance of the guidelines noise level in gardens of Plots 1 & 37 is not considered to cause significant adverse effect on future residents.

6.6 Proposed Pumping Station

- 6.6.1 The proposed development includes a pumping station in the southern part of the site. The noise emission of the pumping station will be limited to reduce the likelihood of an adverse effect.
- 6.6.2 Noise emissions from the pumping station should be limited to a level which is no louder than the night-time background sound level shown in Section 3 of this report. These noise limits will need to be achieved at the nearest proposed dwellings.
- 6.6.3 Any noise characteristics (e.g. tonal sound) should be minimised to further reduce any potential impact.
- 6.6.4 For the avoidance of doubt, the rating sound level from the pumping station should be limited to 35dB(A) at the nearest noise sensitive dwelling, when calculated in accordance with BS4142.

7 UNCERTAINTY

7.1 Introduction

- 7.1.1 This section discusses the limitation and potential sources of uncertainty within the assessment methodology. The uncertainties are discussed below for the baseline sound survey, acoustic modelling and subsequent assessment.

7.2 Baseline Sound Survey

- 7.2.1 All sound surveys are limited by the instrumentation used to undertake the measurements. Uncertainty may arise as a result of the internal processes within the sound level meter to measure and process the measured sound into the relevant noise indices. The accuracy of the equipment used has been monitored via calibration both prior to and upon completion of the noise survey at each position. All sound level meters used meet the 'Class 1' criteria defined within BS EN 61672-2:2013+A1:2017 – 'Electroacoustics. Sound level meters – Pattern evaluation tests'. All calibrators used meet the 'Class 1' criteria defined within BS EN IEC 60942 – 'Electroacoustics sound calibrators'.
- 7.2.2 Any influence due to human error has been minimised by ensuring that all sound monitoring equipment is installed safely and securely. All measurements were undertaken at a minimum of 1.5 m above local ground level and 3.5 m from other reflective surfaces to minimise influence from reflected sound waves.

7.3 Acoustic Modelling & Calculations

- 7.3.1 Uncertainty and limitations arise during the modelling process as a result of the sound propagation models used to inform the calculations. The sound levels at the nearest receptors have been calculated using the internationally accepted guidance within ISO 9613 which is implemented by the 3D acoustic modelling software (SoundPLAN) used to predict noise levels across the development site. This standard claims an accuracy of ± 3 dB for source heights up to 30 m and propagation distances between 100 m and 1 km.
- 7.3.2 The calculations have been undertaken using sound data and information provided by the client and RPS' experience with similar sites. As such, the data adopted as part of this assessment has been chosen to provide realistic noise emission levels.

8 CONCLUSIONS

8.1 Melksham Road, Holt

- 8.1.1 The RPS Acoustics Team (RPS) has been commissioned by Bewley Homes PLC to undertake a noise assessment to accompany an application to discharge the planning condition for a proposed residential development at Melksham Road, Holt, Trowbridge. The proposed development is bounded by Melksham Road to the north, Great Parks and the houses thereon to the west and fields to the south and east. The site lies within the administrative boundaries of Wiltshire County Council (WiltC).
- 8.1.2 The proposed development was granted planning permission at appeal (Appeal Reference – APP/Y3940/W/23/3315432) with conditions. The relevant condition for noise, Condition 6, states:
- ‘An Acoustic Report addressing potential noise for future residents, together with a scheme for protecting the future residents from any invasive noise shall be submitted to the local planning authority for approval with or before the submission of reserved matters. No development shall commence until that report and scheme have been approved in writing by the local planning authority, and prior to the first occupation of any dwelling, all works that form part of the scheme for protecting future residents from any invasive noise shall be completed and thereafter retained.’*
- 8.1.3 This report has been prepared to provide the information necessary to discharge Condition 6, as detailed above, and to address the comments received from WiltC following the submission of the original report.
- 8.1.4 An assessment of the site has identified that road traffic noise and noise from the public address system used during events at WWEC are the main sources of potentially intrusive noise at future dwellings.
- 8.1.5 The noise from road traffic and equestrian events at WWEC have been modelled using SoundPLAN software to quantify potential adverse effects, and to predict the effects of any mitigation measures.
- 8.1.6 An assessment of predicted internal noise levels shows that a basic façade design is sufficient for the majority of dwellings to ensure that internal noise levels fall within guideline recommended limits. For those properties experiencing higher noise levels, an enhanced façade design has been specified to ensure that internal noise levels are controlled sufficiently. The properties requiring passive, through-wall ventilation and / or an enhanced façade specification are detailed in Figure 5 and 6 in Appendix A.
- 8.1.7 All gardens for plots closest to Melksham Road should be surrounded by garden fences/walls which are at least 1.8 m high, these fences should be close boarded fences with a superficial mass of at least 15 kgm⁻². This will ensure that the upper aspirational guideline noise levels (as detailed in BS 8233:2014) in outdoor amenity areas are met in the gardens at all but two of the proposed dwellings. As is acknowledged by BS8233, a slight exceedance to the guidelines noise level in gardens is not considered to be an obstacle to development.
- 8.1.8 A noise level limit has been provided for the proposed pumping station at the site.
- 8.1.9 Therefore, subject to the guidance contained within this report being followed, the requirements of Planning Condition 6 will be met.

Appendix A: Figures



Notes

1. This Drawing has been prepared in accordance with the scope of RPS' appointment with its client, and is subject to the terms and conditions of that appointment. RPS accepts no liability for the use of this document other by its client and only for the purposes for which it was prepared and provided.

2. If received electronically it is the recipients responsibility to print to correct scale. Only written dimensions should be used.

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DRG Size A3	Scale 1:1000	Date Drawn 28/04/2025
Drawn by RC	Checked by PL	Approved by PL

Client:
Bewley Homes PLC

Project: Melksham Road Holt

DRG No:
Figure 1: Site Map

Title:
Site Map



Key

- Basemap
- Area
- Line source
- Main building
- Fence / Wall
- Garage

Mitigation Requirements - Night-time (Bedrooms)

- Facade Treatment 1
- Facade Treatment 2
- Facade Treatment 3

Notes
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Client:
Bewley Homes PLC

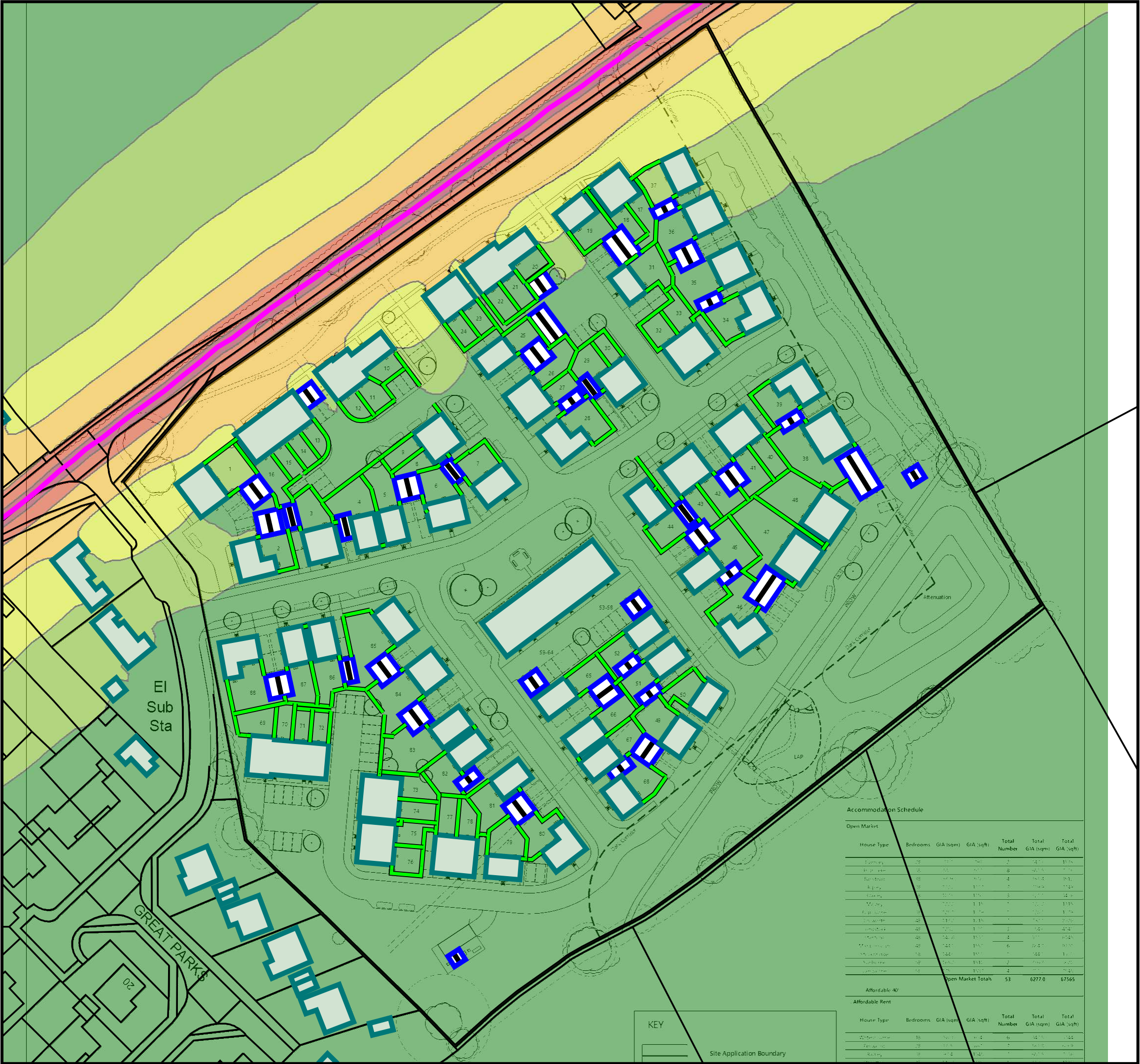
Project:
Melksham Road Holt

DRG No:
Figure 6: Night-time Facade Treatment Requirements

Title:
Night-time Facade Treatment Requirements

Accommodation Schedule

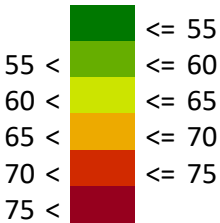
Open Market						
House Type	Bedrooms	GIA (sqm)	GIA (sqft)	Total Number	Total GIA (sqm)	Total GIA (sqft)
Luxury	28	1117	1201	3	3471	3736
High end	35	115	1243	8	4675	5035
Superstar	45	1474	1587	4	5894	6354
Big city	35	1112	1199	5	5560	5994
Starry	35	1112	1199	3	3337	3597
Midway	35	1112	1199	1	1112	1199
East coast	35	1112	1199	1	1112	1199
Low end	45	1112	1199	1	1112	1199
Midwest	45	1112	1199	2	2224	2398
Midwest	45	1112	1199	4	4448	4796
Midwest	45	1112	1199	6	6672	7194
Midwest	45	1112	1199	1	1112	1199
Midwest	45	1112	1199	2	2224	2398
Midwest	45	1112	1199	2	2224	2398
Open Market Totals				53	6277.0	67565
Affordable 40%						
Affordable Rent						
House Type	Bedrooms	GIA (sqm)	GIA (sqft)	Total Number	Total GIA (sqm)	Total GIA (sqft)
Winter	15	1112	1199	6	6672	7194
Winter	15	1112	1199	1	1112	1199
Winter	15	1112	1199	1	1112	1199
Winter	15	1112	1199	1	1112	1199
Totals				21	1703.4	18335



Key

- Basemap
- Area
- Line source
- Main building
- Fence / Wall
- Garage

Daytime Noise Levels (dB L Aeq, 1 hr)



Notes

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DRG Size A3	Scale 1:1000	Date Drawn 28/04/2025
Drawn by RC	Checked by PL	Approved by PL

Client:
Bewley Homes PLC

Project:
Melksham Road Holt

DRG No:
Figure 7: Grid Noise Map - Day

Title:
Daytime Noise Levels

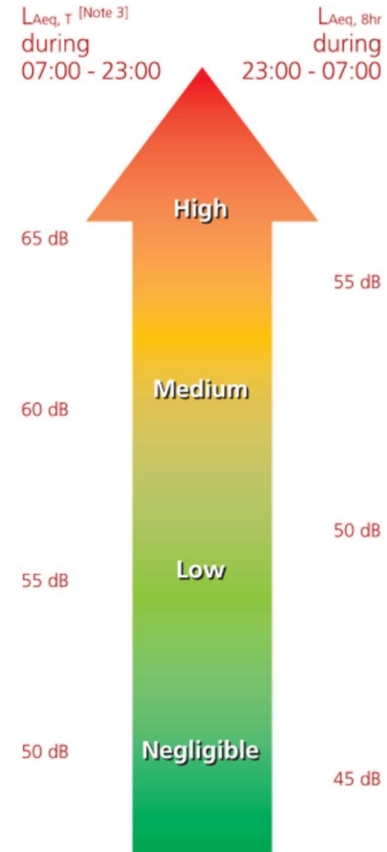
Appendix B: Guidance, Policy & Standards

8.2 Acoustics, Ventilation & Overheating (AVO)

- 8.2.1 The typical method of providing relief from overheating involves the use of open windows, which likely results in an increase in the internal noise levels. The resulting impacts depend on two factors:
- The level of noise inside the habitable rooms; and
 - The frequency with which open windows are required, and the occupants are exposed to higher noise levels.
- 8.2.2 The proposed dwellings, where possible, should be designed to reduce the duration and frequency that windows are required to be opened to remove excess heat, and thus minimise the adverse noise impacts.
- 8.2.3 The Acoustics, Ventilation and Overheating Guide (AVO)¹ provides a means of assessing the potential adverse impacts due to noise if open windows are relied upon to control overheating. This guidance contributes to the practice of good acoustic design as described in ProPG.
- 8.2.4 A Level 1 assessment assesses the risks based upon the external levels at the proposed façade. The following guidance is provided to assess the potential impacts due to noise if open windows are proposed for overheating control.

¹ The Association of Noise Consultants (ANC), Institute of Acoustics (2020), '*Acoustics, Ventilation and Overheating Residential Design Guide, Version 1.1*'

Table 8.1: AVO Stage 1 Risk Assessment

Risk Category – Level 1 Assessment	Potential Effect Without Noise Mitigation	Recommendation for Level 2 Assessment
	Use of open windows as primary means of mitigating overheating not likely to result in adverse effect. Increasing risk of adverse effect	Not required Optional Recommended
Note 1	The noise levels suggested assumes a steady road traffic noise source but may be adapted for other types of transport. All levels are external free-field noise levels.	
Note 2	The values presented in this table should not be regarded as fixed thresholds and reference can also be made to relevant dose-response relationships.	
Note 3	A decision must be made regarding the appropriate averaging period to use. The averaging period should reflect the nature of the noise source, the occupancy profile and time s at which overheating might be likely to occur. Further guidance can be found in the IEMA Guidelines.	
Note 4	Where 78 dB $L_{AF,max}$ is normally exceeded during the night-time period (2300-0700), a Level 2 assessment is recommended.	
Note 5	The risk of adverse effect occurring will also depend on how frequently and for what duration the overheating condition occurs.	
Note 6	To evaluate the risk category for a dwelling, all three aspects of external noise exposure (i.e. daytime, night-time and individual noise events) should be evaluated. The highest risk category for any of the three aspects applies.	

8.2.5 Following a Level 1 assessment, sites with areas that are deemed to be at high risk of adverse effect due to noise should be subject to a Level 2 assessment which is dependent upon the internal noise level and the frequency and duration that the site is likely to overheat, the latter of which requires an overheating assessment by a suitably qualified engineer.

8.3 British Standard 8233:2014 'Guidance on sound insulation and noise reduction for buildings'

8.3.1 BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings'² provides guideline values for internal ambient noise levels in spaces when they are unoccupied. A summary of the levels recommended in Section 7.7 and Table 4 of BS 8233 for rooms used for resting, dining and sleeping is provided in Table 8.2 below. The guideline values in Table 8.2 are annual average values and do not have to be achieved in all circumstances.

8.3.2 The guidance in Section 7.7 of BS 8233 applies to external noise as it affects the internal acoustic environment from sources without a specific character. The paragraph states, including the accompanying note:

"... Occupants are usually more tolerant of noise without a specific character than, for example, that from neighbours which can trigger complex emotional reactions. ..."

"NOTE Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."

Table 8.2: BS 8233:2014 Indoor Ambient Noise Levels for Dwellings

Activity	Location	07:00 to 23:00 hours	23:00 to 07:00 hours
Resting	Living room	35 dB $L_{Aeq,16h}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16h}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

8.3.3 Note 7 relating to Table 4 of BS8233 states the following:

"Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

8.3.4 In relation to external noise levels, the paragraph 7.7.3.2 of BS8233 states:

"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, 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."

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is

² British Standards Institution. British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings.

still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space."

- 8.3.5 Paragraph 7.7.4 and Table 6 of BS 8233 suggest ambient noise levels within non-domestic buildings that should not normally be exceeded. The design ranges provided in Table 6 are reproduced in Table 8.3 below.

Table 8.3: BS 8233:2014 Typical noise levels in non-domestic buildings

Activity	Location	Design range $L_{Aeq,T}$ (dB)
Speech or telephone communications	Department store, cafeteria, canteen, kitchen	50 - 55
	Concourse, corridor, circulation	45 - 55
Study and work requiring concentration	Library, gallery, museum	40 - 50
	Staff/meeting room, training room	35 - 45
	Executive office	35 - 40
Listening	Place of worship, counselling, meditation, relaxation	30 - 35

- 8.3.6 At paragraph 6.5.2, BS 8233 states "Where industrial noise affects residential or mixed residential areas, the methods for rating noise in BS 4142 should be applied". However, the assessment contained within BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'³ requires consideration of the absolute levels of sound immissions at NSRs. This is required for the consideration of the context of the specific sound in the BS 4142 assessment and comparison with the 'examples of outcomes' described in the Planning Practice Guidance on Noise (PPGN)⁴ (e.g. whether certain activities are likely to be avoided within dwellings during periods of intrusion).
- 8.3.7 Sound of an industrial nature may include features such as a distinguishable, discrete and continuous tone, be irregular enough to attract attention, or strong low-frequency content. In which case and with reference to the accompanying note to paragraph 7.7.1, lower noise limits than those in subclause 7.7 of the Standard might be appropriate. BS 4142 provides guidance on methods for assessing the audibility of tones in sound or the prominence of impulsive sounds.
- 8.3.8 NB - BS 8233 should not be used for the purpose of assessing the effects of a new noise source on existing noise sensitive development contrary to what the Standard states in the Introduction. The committee chairman has indicated that a 'not' is missing from the note in the Introduction although this issue is confused by the last paragraph in Clause 5.1.

³ British Standards Institution. British Standard 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound.

⁴ Ministry of Housing, Communities and Local Government. National Planning Practice Guidance – Noise. March 2019

Appendix C: Previous Report

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ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT



GLADMAN DEVELOPMENTS LIMITED

MELKSHAM ROAD, HOLT

NOISE ASSESSMENT REPORT

MARCH 2022

DATE ISSUED: MARCH 2022
JOB NUMBER: GM12008
REPORT NUMBER: 0002
VERSION: V1.0
STATUS: FINAL

GLADMAN DEVELOPMENTS LIMITED

MELKSHAM ROAD, HOLT

NOISE ASSESSMENT REPORT

MARCH 2022

PREPARED BY:

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APPROVED BY:

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ENERGY AND CLIMATE CHANGE
ENVIRONMENT AND SUSTAINABILITY
INFRASTRUCTURE AND UTILITIES
LAND AND PROPERTY
MINING AND MINERAL PROCESSING
MINERAL ESTATES
WASTE RESOURCE MANAGEMENT

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APPENDICES

Appendix A	Noise Legislation and Guidance
Appendix B	Noise Monitoring Results
Appendix C	Assessment of Background Sound Levels
Appendix D	Early Stage Overheating Risk Tool

DRAWINGS	TITLE	SCALE
GM12008-001	Noise Monitoring Location Plan	1:2,500

EXECUTIVE SUMMARY

Wardell Armstrong LLP has carried out a noise assessment for a proposed residential development at Land off Melksham Road, Holt, comprising dwellings and associated infrastructure.

The assessment is based on the results of a noise survey carried out on the 20th and 21st of January 2022.

The dominant source of noise affecting the proposed development site is road traffic on Melksham Road. The majority of the proposed development is expected to achieve the internal and external guideline noise levels with no mitigation in place. Only those dwellings closest to and facing Melksham Road are expected to require mitigation.

For the dwellings located closest to Melksham Road, external amenity areas will be protected by locating garden areas on the screened side of the proposed dwellings, facing away from the road.

A 10m standoff between Melksham Road and the closest proposed dwellings will provide some natural noise attenuation for the proposed development. With this in place, internal noise guideline levels, during the day and night-time, can be achieved at properties closest to the road using standard thermal glazing together with an alternative means of ventilation so that windows can remain closed when the occupant so chooses.

Sensitive rooms located on the screened facades of those dwellings and on all facades of dwellings further into the proposed development are likely to achieve the internal guideline noise levels even with the windows open.

An assessment of the overheating risk at the site has been carried out using the Good Home Alliance Early Stage Overheating Risk Tool, which shows that the proposed development site is at a low risk of experiencing overheating.

An assessment of industrial noise generated by the water pumping station, to the north of the site, has been carried out. This indicates that while noise from the water pumping station may exceed background sound levels during the night-time period, the absolute level from this is low. Therefore, with the glazing and ventilation scheme required to protect residents from road traffic noise, the industrial noise is expected to generate no more than a low impact, which is the lowest category set out in BS4142.

1 INTRODUCTION

- 1.1.1 Wardell Armstrong LLP (WA) was commissioned by Gladman Developments Ltd to undertake a noise assessment for a proposed residential development on Land off Melksham Road, Holt.
- 1.1.2 The proposed development is located on land to the north-west of Holt. To the north-west, the site is bound by Melksham Road, with open agricultural land beyond. To the north, the site is bound by Melksham Road, with a water pumping station beyond, and the Stagwood Equestrian Centre beyond. To the east, the site is bound by the West Wilts Equestrian Centre. To the south, the site is bound by open land. To the west, the site is bound by existing dwellings on Great Parks.
- 1.1.3 The proposed development is located on open land, understood to currently form a part of the West Wilts Equestrian Centre, and comprises a proposed residential development with associated infrastructure. A location plan is shown on Drawing Number GM12008-001.
- 1.1.4 This noise assessment report has been prepared to accompany an outline planning application for the erection of up to 90 dwellings, with public open space, structural planting, landscaping, sustainable drainage systems (SuDS) and vehicular access point. All matters reserved except for means of access. The report assesses the results of noise monitoring carried out in accordance with current guidance and includes recommendations for mitigation where appropriate.

2 ASSESSMENT METHODOLOGY

2.1.1 WA carried out consultation regarding the noise assessment methodology with Mr Damaris Broad, the Environmental Health Officer (EHO) at Wiltshire Council (WC). Via email on the 11th January 2022, Mr Broad confirmed that a screening assessment would not be sufficient for this proposed development, and requested that a full noise assessment be carried out. Mr Broad specified that he expects Melksham Road to be a significant noise source affecting the site, therefore a full assessment informed by a noise survey is required to determine the mitigation scheme required.

2.1.2 As part of this assessment, WA has carried out partially attended noise monitoring to assess the current noise levels at the proposed development site.

2.1.3 The assessment has been carried out in accordance with all relevant guidance.

2.2 Noise Guidance and Standards

2.2.1 The noise assessment takes into account current guidance and standards including the following:

- National Planning Policy Framework, 2021 (NPPF).
- Noise Policy Statement for England, 2010 (NPSE).
- Planning Practice Guidance - Noise, 2019 (PPG).
- ProPG: Planning & Noise: Professional Practice Guidance on Planning and Noise, 2017 (ProPG).
- AVO: Acoustics, Ventilation and Vibration – Residential Design Guide, 2020 (AVO).
- British Standard 8233: 2014 Guidance on Sound Insulation and noise reduction for buildings (BS8233).
- British Standard 4142:2014 + A1:2019, Methods for rating and assessing industrial and commercial sound (BS4142).
- Department of Transport's memorandum, 'Calculation of Road Traffic Noise' (CRTN), 1998.

2.2.2 Further details of these documents are included in Appendix A.

3 NOISE SURVEY

3.1 Introduction

- 3.1.1 On the 20th and 21st January 2022, WA carried out a noise survey to measure the existing ambient and background sound levels at the proposed development site.
- 3.1.2 A site walkover was carried out prior to the noise survey to identify the noise sources affecting the proposed development site. No noise from the nearby equestrian centres to the north and east of the site, was audible during site walkover and monitoring. Therefore, this has not been considered further as a noise source.
- 3.1.3 However, detailed analysis of the noise survey data shows that noise from the pumping station is likely to have affected the noise levels during the evening and night-time periods, between 2100 hours and 0330 hours. This has therefore been considered to be an industrial noise source affecting the proposed site during the evening and night-time periods, in accordance with BS4142.
- 3.1.4 Unattended and attended noise measurements, supplemented with site observations, were taken between 1300 hours on the 20th January 2022 and 1230 hours on the 21st January 2022. Two monitoring locations were selected to best capture any noise from Melksham Road and the water pumping station, as well as the nearby equestrian centres.
- 3.1.5 The noise measurements were made using Class 1, integrating sound level meters. The microphones were mounted on tripods 1.5m above the ground and more than 3.5m from any other reflecting surfaces, and with the microphone diaphragms horizontal. The sound level meters were calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift in the calibration during the survey was noted.
- 3.1.6 For the purpose of this assessment, daytime hours are taken to be 0700 to 2300 hours and night-time to be 2300 to 0700 hours.

3.1.7 A-weighted¹ L_{eqs} ² were measured in accordance with the requirements of BS8233. The maximum and minimum sound pressure levels, A-weighted L_{90s} ³, A-weighted L_{10s} ⁴ were also measured to provide additional information.

Meteorological Conditions

3.1.8 The weather conditions during the noise survey were monitored and the details are shown in Table 1 below.

Table 1: Weather Conditions	
Average Temperature	-2 to 5°C
Wind	2 to 4 m/s
Cloud Cover	Approximately 80%
Precipitation	Dry

3.2 Noise Monitoring

3.2.1 This section of the report describes the Monitoring Locations (MLs) used to inform the assessment of noise at the proposed development site. These MLs are shown on Drawing GM12008-001 and are described as follows:

- ML1: Unattended noise monitoring, between 1300 hours on the 20th January 2022 and 1230 hours on the 21st January 2022, at the north-western site boundary, approximately 2m from Melksham Road.
- ML2: Attended noise monitoring, between 1110 hours and 1210 hours on the 21st January 2022, at the north-eastern boundary of the site, adjacent to the West Wilts Equestrian Centre.

¹ A' Weighting An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions

² L_{eqs} Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

³ L_{90} The noise level which is exceeded for 90% of the measurement period.

⁴ L_{10} The noise level which is exceeded for 10% of the measurement period.

Table 2: Noise Monitoring Periods and Observations Made of Noise Sources Audible At Each Monitoring Location.			
Monitoring Location	Start Date and Time	Finish Date and Time	Notes
ML1	20/01/2022 13:00	21/01/2022 12:30	Road traffic on Melksham Road was the dominant noise source at this location. Occasionally noise from aircraft flyovers and birdsong was also audible. Noise from the water pumping station was inaudible on site during the daytime site walkover. However, data analysis shows this to be an audible noise source during the night-time periods.
ML2	21/01/2022 11:10	21/01/2022 12:10	Monitoring at this location was undertaken to establish the noise, if any, from the nearby equestrian centre affecting the proposed development site. However, no noise from the equestrian centre was audible on site.

3.2.2 Road traffic on Melksham Road was the dominant noise source affecting the proposed development site.

3.3 Existing Noise Levels

3.3.1 The road traffic noise levels measured during the noise survey have been divided into daytime (0700-2300 hours) and night-time (2300-0700 hours). The night-time $L_{AF,max}$ level has been determined based on the 10th highest noise level in accordance with ProPG.

3.3.2 A summary of the measured values is shown below in Table 3, and the measured noise levels are set out in full in Appendix B.

Table 3: Measured Road Traffic Noise Levels at Monitoring Locations			
Noise Monitoring Location	Daytime dB $L_{Aeq, 16hour}$	Night-time dB $L_{Aeq, 8hour}$	Night-time dB $L_{AF, max}$
ML1	70	61	83
ML2	44	-	-

3.3.3 Data collected during the noise survey, is representative of the ambient noise levels at the site and has been used to inform this noise assessment.

3.4 Adjusted Noise Levels

3.4.1 The noise monitoring at ML1 was carried out 2m from Melksham Road. However, proposed dwellings are expected to be constructed approximately 10m from the roadside. Therefore, a correction to the noise levels measured at ML1 has been applied in Table 4 below. This correction accounts for the reduction of sound levels which occurs when sound propagates through air.

Table 4: Adjusted Road Traffic Noise Levels at Monitoring Locations			
Noise Monitoring Location	Daytime dB LAeq, 16hour	Night-time dB LAeq, 8hour	Night-time dB LA _F , max
ML1	70	61	83
Correction Required	-7	-7	-14
ML1*	63	54	69
ML1* - Adjusted Noise Level at ML1			

4 SITE RISK ASSESSMENT

4.1 Noise Risk Assessment

4.1.1 In accordance with ProPG:2017, a Site Noise Risk Assessment (SNRA) has been carried out. The SNRA assesses the initial risk of noise from transportation sources having an adverse impact on a proposed development, based on the overall measured levels with no mitigation in place.

4.1.2 Noise monitoring was undertaken at the site boundary, closest to Melksham Road. During the site visits and monitoring, the noise levels at this part of the site were dominated by road traffic noise, measured at ML1. These noise levels have been compared in Table 5 to guidance provided on Figure 1 (*Stage 1 – Initial Site Noise Risk Assessment*) of ProPG:2017, to assess the risk of an adverse impact.

Table 5: Initial Site Noise Risk Assessment Average Daytime and Night-time Noise Levels				
Risk Assessment Location	Average Daytime Noise Level (dB LAeq,16hr)	Daytime Risk of Adverse Effect	Average Night-time Noise Level (dB LAeq, 8hr)	Night-time Risk of Adverse Effect
ML1*	63	Medium	54	Medium

4.1.3 Table 5 indicates that proposed receptors, in close proximity to Melksham Road, are at a Medium risk of experiencing an adverse noise impact due to road traffic during the daytime and night-time periods.

4.1.4 Noise levels further into the site and further away from the north-western boundary are expected to be lower, and therefore the potential for an adverse noise impact at receptors will be reduced.

4.1.5 As there are more than 10 individual $L_{AF, Max}$ events which exceed 60dB at ML1, the short-term noise levels at the site cannot be considered to be negligible, therefore a Stage 2 full assessment has been carried out to consider this.

4.1.6 The SNRA shows that good acoustic design will be required for the proposed development, to ensure that the potential risk of the noise impact is minimised, and guideline internal and external noise levels are achieved.

4.1.7 In accordance with ProPG:2017, a Stage 2 full noise assessment is required to ensure future residents close to the road are protected and good acoustic design has been implemented.

4.2 Overheating Risk Assessment

4.2.1 In accordance with the AVO guide, an Overheating Risk Assessment (ORA) has been carried out. The ORA assesses initial risk of overheating, caused by the need to mitigate against noise generated by nearby transportation sources, based on the noise levels at the development site.

4.2.2 The daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$) noise levels measured at ML1* have been compared to the information provided in Table 3-2 of AVO. The results are shown in Table 6 below.

Table 6: Stage 1 Overheating Risk Assessment					
Risk Assessment Location	Average Daytime Noise Level (dB $L_{Aeq,16hr}$)	Daytime Risk of Overheating	Average Night-time Noise Level (dB $L_{Aeq,8hr}$)	Night-time Maximum Noise Level (dB L_{Amax})	Night-time Risk of Overheating
ML1*	63	Medium	54	69	Medium

4.2.3 Table 6 indicates that during the daytime and night-time periods, proposed receptors located in the north-western part of the development, adjacent to Melksham Road would be at a Medium risk of experiencing overheating due to the likely acoustic design measures required to achieve the recommended internal noise levels.

4.2.4 Proposed receptors further away from the north-western site boundary, and screened by intervening dwellings, are expected to experience lower noise levels, therefore will be at a Negligible risk of overheating, due to the likely acoustic design measures.

4.2.5 The ORA shows that good acoustic design will be required for proposed receptors adjacent to Melksham Road, to ensure that the risk of overheating is minimised and that guideline internal noise levels are achieved.

4.2.6 The overheating risk has been assessed with the use of the Good Homes Alliance Early Stage Overheating Risk Tool, taking into account the location of the site, as well as the noise sources affecting the proposed development. The Early Stage Overheating Tool is shown in Appendix C. This indicates that the proposed development is at a low risk of experiencing overheating.

4.2.7 Therefore, a further Stage 2 AVO overheating assessment is not considered to be necessary.

5 INDUSTRIAL NOISE ASSESSMENT (BS4142)

5.1.1 Site observations and analysis of noise survey data indicate that the nearby water pumping station is audible on site only during the evening and night-time periods. The water pumping station was not audible on the site when any road traffic was present on Melksham Road.

5.1.2 Noise was audible from the water pumping station premises during the evening and night-time periods, therefore a BS4142 assessment has been undertaken to determine the significance of the industrial noise at proposed dwellings.

Identification of the Background Sound Levels

5.1.3 Section 8 of BS4142 provides guidance on the selection of the background sound to be used in the assessment. BS4142 states that the background sound levels used for the assessment should be representative of the period being assessed (i.e., daytime or night-time periods), and that there is no “single” background sound level.

5.1.4 Therefore, some assessment of the measured noise levels is required to select the most appropriate and representative background sound levels, when the water pumping station is not operational. An assessment has been carried out based upon the measured sound levels during the evening and night-time periods.

5.1.5 The assessment is set out in Appendix C of this report and the appropriate background sound levels, used in the assessment, are shown in Table 7 below.

Table 7: Appropriate Selected Background Sound Levels		
Monitoring Location	Evening Background Sound Level LA90, 1hr (dB)	Night-time Background Sound Level LA90, 15mins (dB)
1	40	35

Specific Sound Level

5.1.6 Noise from the pumping station, close to the north-western site boundary, includes sound sources which may impact upon future sensitive receptors. Analysis of the noise survey data, collected at ML1, indicates that noise from the pumping station is audible on site only between the hours of 2100 and 0330. Therefore, only the evening and night-time periods have been considered in the industrial noise assessment.

5.1.7 The computer software has been used to identify and isolate noise from the pumping station from the ambient acoustic environment.

5.1.8 The specific sound level of the pumping station was found to be 41dB at ML1, during the evening and night-time periods. This is a representative level of sound generated by pumping station, measured at the monitoring location. This specific sound level has been used for the BS4142 assessment.

Rating Level

5.1.9 An assessment of the sound spectrum of the pumping station has been carried out in accordance with Appendix C of BS4142. This assessment indicates that an objective tone is not present, therefore a +6dB correction is not appropriate. However, it is considered that a subjective tonality would be perceptible on site. Therefore a +2dB correction is considered to be appropriate, to allow a robust assessment of the sound. Figure 1 below shows the linear frequency spectrum of the specific sound level, and demonstrates the likely existence of a tone at 630Hz.

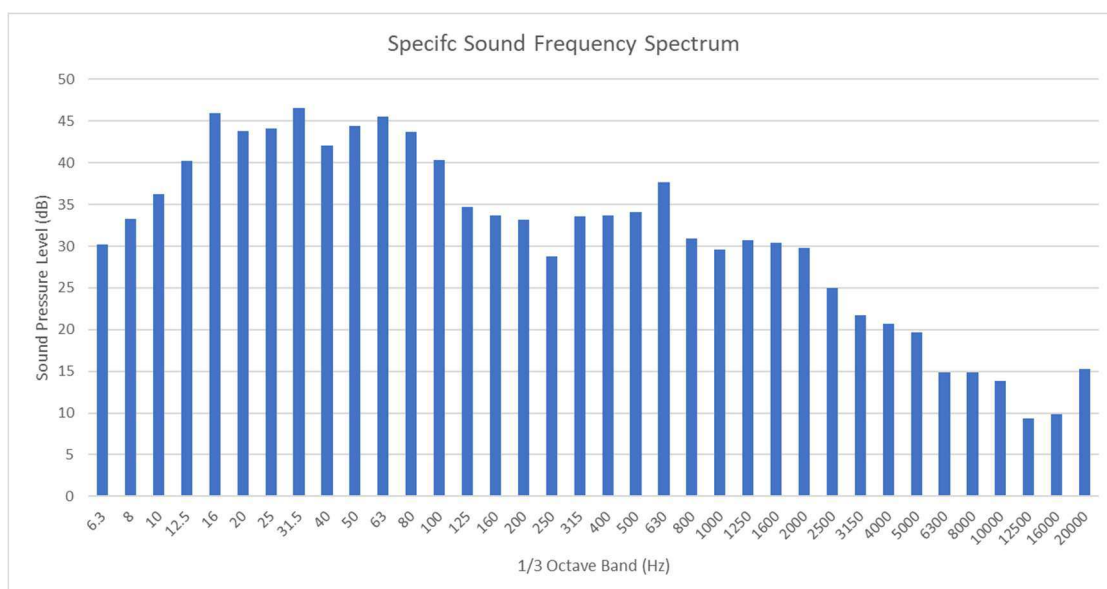


Figure 1 – Specific Sound Frequency Spectrum

5.1.10 As the water pumping station is found to generate a constant sound, during its entire operational period, no acoustic characteristic corrections for impulsiveness or intermittency have been added to the measured specific sound level

5.1.11 The proposed dwellings have been assumed to be located 10m into the proposed development site. Therefore, a correction to account for the difference between the distance from the pumping station to ML1, and between the pumping station to a proposed dwellings is required. ML1 is located approximately 15m from the pumping station, and the closest proposed receptors are expected to be located approximately

23m away from the pumping station. Therefore, correction of -4dB is required to account for the reduction of sound occurring due to the propagation over distance.

Comparison of Background Sound and Rating Level

5.1.12 In accordance with BS4142, the calculated evening and night-time rating levels from the water pumping station, in the vicinity of the closest proposed dwellings, have been compared with the measured background sound level, as shown in Table 8.

Table 8: BS4142 Assessment of Industrial Noise from Pumping Station at ML1		
Description	Evening Assessment	Night-time Assessment
Specific Sound Level (dB)	41	41
Acoustic Correction Feature (dB)	+2	+2
Distance Correction (dB)	-4	-4
Rating Level (dB)	39	39
Background Noise Level (dB L _{A90})	40	35
Excess of rating over background level (dB)	-1	+4

5.1.13 The results of the BS4142 assessment in Table 8 indicate that with no mitigation measures in place, rating levels from the water pumping station will not exceed background sound levels during the evening period. However, they will exceed the background sound levels during the night-time period by 4dB, in the north-western part of the development site. In accordance with BS4142, a difference of around +5dB indicates an adverse impact due to noise, depending on the context. Therefore, depending on the context of the noise, the water pumping station may generate an adverse impact at the nearest dwellings.

5.1.14 The impact of industrial noise at dwellings further into the site, and therefore further away from the water pumping station is expected to be less.

5.2 BS4142 Context Assessment

5.2.1 BS4142 states that the acceptability of the noise level depends on the context. BS4142:2014 states “The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound sources exceeds the background sound level and the context in which the sound occurs”.

5.2.2 The first requirement of this statement has been determined within the noise impact assessment section above. To determine the context in which the industrial sound will reside, three factors must be considered, these are;

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and;
- The sensitivity of the receptor.

Absolute Level of Sound

5.2.3 To determine the first context test in BS4142 it is necessary to determine whether the residual and background sound levels are high or low. Section 11 of BS4142 states;

“Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.”

5.2.4 The background sound level during the night-time periods is considered to be very low, and the rating level is also low, well below the noise level at which mitigation might be contemplated. Therefore, the absolute level of noise from water pumping station is considered to be more relevant than the margin by which the rating level exceeds the background sound.

5.2.5 It is therefore likely that this will decrease any potential noise impact.

Character and Level of Residual Sound Compared with the Rating Level

5.2.6 The character of the observed residual noise during the daytime is dominated by road traffic noise on Melksham Road, which contains low to mid frequency noise. The specific noise from the water pumping station mainly contains mid frequency noise. Therefore, noise generated by the water pumping station is expected to have a broadly similar character to that of road traffic.

- 5.2.7 The residual noise levels at ML1*, during the night-time periods, are 54dB(A), whereas, the rating level of the water pumping station is 39dB. The rating level is therefore significantly below the existing residual levels at the nearest proposed receptor. The impact of industrial sound on receptors will therefore be lower than is suggested by Table 8.

Sensitivity of Receptors

- 5.2.8 With regard to pertinent factors to be taken into consideration, Section 11 of BS4142 states;

“The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

i) facade insulation treatment;

ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

iii) acoustic screening.”

- 5.2.9 The proposed receptors will be residential in nature, and therefore will be of a moderate sensitivity to industrial noise. However, the nearest dwellings to Melksham Road, and to the pumping station, will be provided with mitigation against road traffic noise. Given that the level of road traffic noise is far in excess of noise from the pumping station (even when an allowance for the slight tonality of the noise is included) the noise mitigation will be more than adequate to deal with any noise from the pumping station.

- 5.2.10 Mitigation measures as discussed in Section 7 of this report.

5.3 Summary of BS4142 Assessment

- 5.3.1 An assessment of industrial noise was carried out on site to establish the likelihood of the nearby water pumping station affecting the proposed development.
- 5.3.2 The assessment finds that due to the character of noise and low absolute level of the water pumping station, especially in comparison to the residual sound level, and mitigation measures required to reduce them, the proposed dwellings are likely to experience no more than a **low impact** during the evening and night-time periods.

6 NOISE IMPACT ASSESSMENT

6.1 Introduction

6.1.1 The results of the ProPG:2017 Stage 1: Initial Site Noise Risk Assessment show that the proposed dwellings closest to Melksham Road are at a Medium risk of experiencing an adverse noise impact due to road traffic during the daytime and night-time periods.

6.1.2 Therefore, this section details the likely mitigation measures necessary to reduce this risk at proposed dwellings.

BS8233 Assessment of Daytime Noise Levels in Outdoors Living Area

6.1.3 The calculated daytime noise levels, as detailed in Table 4, have been used to determine the noise levels likely in outdoor living areas of proposed dwellings in the vicinity of the noise sources during the daytime period.

6.1.4 Table 9 summarises the measured noise level and the attenuation required to achieve the noise guideline level of 55dB $L_{Aeq, 16hr}$ which is recommended in BS8233, during the daytime in outdoor living areas.

Table 9: Average Daytime Noise Levels in Outdoor Living Areas		
Representative Monitoring Location	Measured Noise Level (dB $L_{Aeq, 16hr}$)	Level of Attenuation Needed to Achieve 55dB $L_{Aeq, 16hr}$ in Outdoor Living Areas
ML1* – North-western site boundary, representative of noise from Melksham Road	63	8dB
ML2 – Eastern site boundary, representative of noise from West Wilts Equestrian Centre	44	0

6.1.5 The proposed dwellings closest to Melksham Road will require mitigation to reduce the impact of road traffic noise in proposed garden areas. The acoustic attenuation scheme is detailed in Section 7 of this report.

Assessment of Daytime Noise Levels in Living Rooms and Bedrooms

6.1.6 The daytime noise levels in noise sensitive rooms of the proposed dwellings have been assessed in accordance with BS8233 for living room and bedroom areas. The daytime noise guideline level within living rooms and bedrooms is 35 dB $L_{Aeq, 16hr}$.

6.1.7 The calculated daytime noise levels have been used to determine the noise levels likely at facades of the dwellings during the daytime period.

- 6.1.8 Before internal noise levels can be calculated, 3dB(A) must be added to the free-field measured levels to allow for the reflection of noise from the proposed facades when the buildings are in place.
- 6.1.9 The calculated noise levels at the facades of the proposed dwellings, together with the level of attenuation required to achieve 35dB L_{Aeq} (16hr) in living rooms and bedrooms is summarised in Table 10.

Table 10: Facade Noise Level at Dwellings Located Closest to Site Boundaries and Level of Attenuation Required to Achieve the Internal Daytime Noise Guideline Level		
Representative Monitoring Location	Noise Level at the Facade of the Property (dB L_{Aeq})	Level of Attenuation Needed to Achieve Noise Guideline Levels in Living Rooms and Bedrooms dB(A)
ML1* – North-western site boundary, representative of noise from Melksham Road	66	31
ML2 – Eastern site boundary, representative of noise from West Wilts Equestrian Centre	47	12

- 6.1.10 The results indicate that noise sensitive rooms, nearest to the north-western boundary, are likely to exceed noise guideline levels with windows open during the daytime. Therefore, sensitive facades of proposed dwellings closest to and facing Melksham Road, will require mitigation to minimise the impact of road traffic noise. Mitigation is discussed in Section 7 of this report.
- 6.1.11 The facades further into the site will be screened by intervening buildings, and therefore the levels of attenuation required will be less than those detailed in Table 10.

Assessment of Night-time Noise Levels in Bedrooms

- 6.1.12 The night-time noise levels in noise sensitive rooms of the proposed dwellings have been assessed in accordance with BS8233 and ProPG for bedroom areas. The guideline noise level within bedroom areas is 30 dB L_{Aeq} 8hour. In addition, individual noise events should not normally exceed 45dB L_{Amax} .
- 6.1.13 The calculated night-time noise levels have been used to determine the noise levels likely at the facades of the dwellings during the night-time period.
- 6.1.14 Before internal noise levels can be calculated, 3dB(A) must be added to the free-field measured levels to allow for the reflection of noise from the proposed facades when the dwellings are in place.

6.1.15 The measured noise levels at the facades of the proposed dwellings, together with the level of attenuation required to achieve 30dB L_{Aeq} and 45dB L_{Amax} in the bedrooms, are summarised in Table 11.

Table 11: Facade Noise Level and Level of Attenuation Required to Achieve the Internal Night-Time Noise Guideline Levels			
Representative Monitoring Location	Noise Level at the Façade of the Property (dB $L_{Aeq, 8hr}$)	Maximum Noise Level at the Façade of the Property (dB L_{Amax})	Level of Attenuation Needed to Achieve the Noise Guideline Levels in Bedrooms (dB(A))
ML1 – North-western site boundary, representative of noise from Melksham Road	57	72	27

6.1.16 The results indicate that the noise sensitive rooms, nearest to north-western boundaries, are likely to exceed noise guideline levels with windows open during the night-time period. Therefore, sensitive facades of proposed dwellings closest to and facing Melksham Road will require façade mitigation, to minimise the impact of road traffic noise. Mitigation is discussed in Section 7 of this report.

6.1.17 The facades further into the site will be screened by intervening buildings. It is considered that the levels of attenuation required will be less than that detailed in Table 11.

7 ACOUSTIC DESIGN STATEMENT

7.1 Daytime Noise Levels in Outdoor Living Areas

- 7.1.1 The noise levels, as detailed in Table 9, indicate that gardens located closest to Melksham Road, represented by ML1, will require mitigation to achieve the guideline daytime noise level of 55dB L_{Aeq}.
- 7.1.2 To achieve guideline noise levels in gardens, it is recommended that gardens are located on the screened side of the dwellings, and localised close boarded fencing is used between gardens and Melksham Road, as required.
- 7.1.3 The height and location of the fencing can be determined during the detailed design stage of the application.

7.2 Daytime Living Rooms and Bedrooms

- 7.2.1 When assessing daytime noise levels in noise sensitive rooms, the noise attenuation provided by the overall building façade should be considered. To mitigate noise levels, the composition of the building façade can be designed to provide the level of attenuation required. Glazing is generally the building element that attenuates noise the least, so the proportion of glazing in a building façade is an important consideration when assessing overall noise attenuation.
- 7.2.2 In the absence of design details for the building facades, it has been assumed that the glazing to noise sensitive rooms would comprise about 25% of the façade area. To calculate the overall attenuation provided by this percentage of glazing in a brick or block façade, a non-uniform partition calculation can be used.
- 7.2.3 The calculation combines the different degrees of attenuation of the wall element and the window element. A façade element comprising a standard modern solid brick or block work construction will typically attenuate by 50-55dB (BS 8233: Table E1.A) whereas standard double glazing will attenuate road traffic noise by 26-29dB(A) (BRE Digest 379 'Double glazing for heat and sound insulation'). The overall noise attenuation provided by this combination is therefore between 32dB(A) and 35dB(A).
- 7.2.4 With windows open, the attenuation provided by the façade will be approximately 13dB(A). This would allow the recommended internal noise guideline levels to be exceeded in some living rooms and bedrooms, which are closest to and facing Melksham Road.

- 7.2.5 On occasion, this may be acceptable to the residents, but when quiet conditions are required, the residents should be able to close windows whilst maintaining adequate ventilation.
- 7.2.6 Therefore, closed windows with standard thermal glazing, and an alternative means of ventilation are required to ensure that internal noise guideline levels are met within living room and bedroom areas in dwellings located closest to and facing Melksham Road if dwellings at least 10m from the site boundary.
- 7.2.7 Dwellings located further into the site and screened by intervening dwellings, are expected to achieve recommended internal noise levels with windows open to maintain whole dwelling ventilation. Noise sensitive rooms located on the screened facades of dwellings are expected to achieve internal guideline noise levels while maintaining background ventilation with open windows.
- 7.2.8 Living rooms and bedrooms located further into the site, screened by intervening dwellings are expected to meet the internal guideline noise levels even with windows open.
- 7.2.9 Glazing and ventilation requirements can be confirmed, once a detailed design layout is available.

7.3 Night-time Bedrooms

- 7.3.1 With windows open, the attenuation provided by the façade will be approximately 13dB(A). This would allow the recommended internal noise guideline levels to be exceeded in some bedrooms, located closest to and facing Melksham Road.
- 7.3.2 On occasion, this may be acceptable to a resident, but when quiet conditions are required, the residents should be able to close windows whilst maintaining adequate ventilation.
- 7.3.3 If proposed dwellings are constructed 10m away from the site boundary, properties represented by ML1*, closest to and facing Melksham Road, are likely to require standard thermal glazing, with windows closed, and an alternative means of ventilation to achieve internal guideline noise levels inside bedrooms.
- 7.3.4 Dwellings located further into the site and screened by intervening dwellings, are expected to achieve recommended internal noise levels with windows open to maintain whole dwelling ventilation. Noise sensitive rooms located on the screened

facades of dwellings are expected to achieve internal guideline noise levels while maintaining background ventilation with open windows.

- 7.3.5 Glazing and ventilation requirements can be confirmed, once a detailed design layout is available.

8 CONCLUSIONS

- 8.1.1 Wardell Armstrong has carried out a noise assessment for the proposed residential development located at land off Melksham Road.
- 8.1.2 The dominant noise source, which will potentially affect the residents of the proposed residential development, is road traffic on Melksham Road, and to a lesser extent industrial noise from the water pumping station to the north of the site.
- 8.1.3 The results of the noise survey and assessment indicate that to meet the guideline value of 55dBL_{Aeq} (16 Hour) in outdoor living areas, mitigation should be provided for those gardens located closest to Melksham Road, in the north-western part of the development.
- 8.1.4 Gardens should be located on the screened sides of dwellings which lie closest to Melksham Road. In addition, localised close boarded fencing should be provided around gardens nearest to the road. The height and location of the fencing can be determined during the detailed design stage of the application.
- 8.1.5 Gardens located further into the site, further away from Melksham Road, will be screened by intervening buildings, therefore the orientation of these will need less careful consideration.
- 8.1.6 During the day and night-time, windows with standard thermal glazing will be sufficient to sufficient to control internal noise levels in sensitive rooms closest to Melksham Road, when dwellings are located 10m away from Melksham Road. An alternative means of ventilation will be required so that the occupant can close the windows when desired whilst maintaining adequate ventilation.
- 8.1.7 Alternatively, to meet the required noise levels in these dwellings, living rooms and bedrooms could be located on the screened side of the proposed buildings, furthest away from Melksham Road. This would allow windows to be open for ventilation in all sensitive rooms across the entire site.
- 8.1.8 Dwellings further into the site would be screened by intervening dwellings, therefore they will achieve the recommended internal noise levels even with open windows on every facade.
- 8.1.9 An overheating assessment has been carried out in accordance with AVO guidance. The Early Stage Overheating Risk Tool identifies that the proposed development will

be at a low risk of experiencing overheating. Therefore, it was not required to consider the overheating risk at the site further.

8.1.10 The assessment of noise levels from the water pumping station shows that they will require no noise mitigation. The proposed receptors are likely to experience no more than a low impact due to noise from the water pumping station, which is the lowest level of impact set out in BS4142.

8.1.11 At this stage, a detailed site layout has not yet been confirmed. Mitigation requirements will need to be confirmed once a detailed design layout is available, at the reserved matters stage.

APPENDICES

APPENDIX A

APPENDIX A

Noise Legislation and Guidance

National Planning Policy Framework

- A.1 In 2021 the 'National Planning Policy Framework' (NPPF) was amended as the current planning policy guidance within England. Paragraph 185 of the NPPF states:

'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;*
- b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity values for this reason;''*

Noise Policy Statement for England

- A.2 With regard to 'adverse impacts' the NPPF refers to the 'Noise Policy Statement for England' (NPSE), which defines three categories, as follows:

- 'NOEL – No Observed Effect Level
This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.
- LOAEL – Lowest Observed Adverse Effect Level
This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level
This is the level above which significant adverse effects on health and quality of life occur'.

- A.3 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are

taken to mitigate and minimise the adverse effects of noise. However, this does not mean that such adverse effects cannot occur.

Planning Practice Guidance - Noise

- A.4 The Planning Practice Guidance (PPG-Noise) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable; however, it has no adverse effect as it does not cause any change in behaviour or attitude.
- A.5 Once noise crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise.
- A.6 Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused.
- A.7 At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. The following Table summarises the noise exposure hierarchy.

Table 1: National Planning Practice Guidance Noise Exposure Hierarchy			
Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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 small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, 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
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

A.8 The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

“It can, where justified, although it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern.”

A.9 British Standard 8233 “Guidance on sound insulation and noise reduction for buildings” 2014, suggests the following guideline noise levels and states that they are based on guidelines issued by the World Health Organisation;

- 35 dB L_{Aeq} (16 hour) during the day time in noise sensitive rooms
- 30 dB L_{Aeq} (8 hour) during the night time in bedrooms
- 45 dB $L_{A_{f,Max}}$ during the night time in bedrooms
- 50 dB L_{Aeq} (16 hour) desirable external noise levels for amenity space such as gardens and patios
- 55 dB L_{Aeq} (16 hour) upper guideline value which would be acceptable in noisier environments.

A.10 In addition, for internal noise levels it states;

“Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

A.11 Furthermore, with regard to external noise, the Standard states;

“However, it is also recognised 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”.

BS8233 Guidance on sound insulation and noise reduction for buildings

A.12 British Standard 8233 “Guidance on sound insulation and noise reduction for buildings” 2014 bases its advice on the WHO Guidelines. In addition, for internal noise levels it states:

“Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

A.13 Furthermore, with regard to external noise, the Standard states:

“For traditional external areas that are used for amenity space such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guidance value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognised 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.”

British Standard 4142:2014+A1:2019 (BS4142), Method for rating and assessing industrial and commercial sound:

A.14 BS4142 is used to rate and assess sound of an industrial and/or commercial nature including:

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

A.15 The standard is applicable to the determination of the following levels at outdoor locations:

- rating levels for sources of sound of an industrial and/or commercial nature; and
- ambient, background and residual sound levels, for the purposes of:
 - 1) Investigating complaints;
 - 2) Assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
 - 3) Assessing sound at proposed new dwellings or premises used for residential purposes.

- A.16 The purpose of the BS4142 assessment procedure is to assess the significance of sound of an industrial and/or commercial nature.
- A.17 BS4142 refers to noise from the industrial source as the 'specific noise' and this is the term used in this report to refer to noise which is predicted to occur due to activities associated with Ridgewood Industrial Park. The 'specific noise' levels, of the existing industrial premises that have been measured are detailed in Section 4 of this report.
- A.18 BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level (L_{A90}). Section 4 provides details of the background noise survey undertaken.
- A.19 Certain acoustic features can increase the significance of impacts over that expected from a simple comparison between the specific noise level and the background noise level. In particular BS4142 identifies that the absolute level of sound, the character, and the residual sound and the sensitivity of receptor should all be taken into consideration. BS4142 includes allowances for a rating penalty to be added if it is found that the specific noise source contains a tone, impulse and/or other characteristic, or is expected to be present. The specific noise level along with any applicable correction is referred to as the 'rating level'.
- A.20 The greater the increase between the rating level over the background noise level, the greater the magnitude of the impact. The assessment criteria given by BS4142 are as follows:
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
 - A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
 - The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
- A.21 During the daytime, BS4142 requires that noise levels are assessed over 1-hour periods. However, during the night-time, noise levels are required to be assessed over 15-minute periods.
- A.22 Where the initial estimate of the impact needs to be modified due to context, BS4142 states that all pertinent factors should be taken into consideration, including:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise

A.23 ProPG Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

A.24 A two-stage process is suggested:

- Stage 1 – Initial Noise Risk Assessment
- Stage 2 – Detailed assessment (Acoustic Design Statement), required where the Stage 1 risk is identified above negligible.

The guidance reflects the Government's overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance - Noise and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisors, on achieving good acoustic design in and around new residential developments.

AVO: Acoustics, Ventilation and Overheating Residential Design Guide

A.25 The AVO guide recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating. The application of the AVO Guide is intended to demonstrate good acoustic design in accordance with ProPG. A two-stage assessment approach is advised as:

- Stage 1: Site Risk Assessment
- Stage 2: Detailed Assessment of Adverse Effect

A.26 The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage. It also assists in educating clients, environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

APPENDIX B

Appendix B

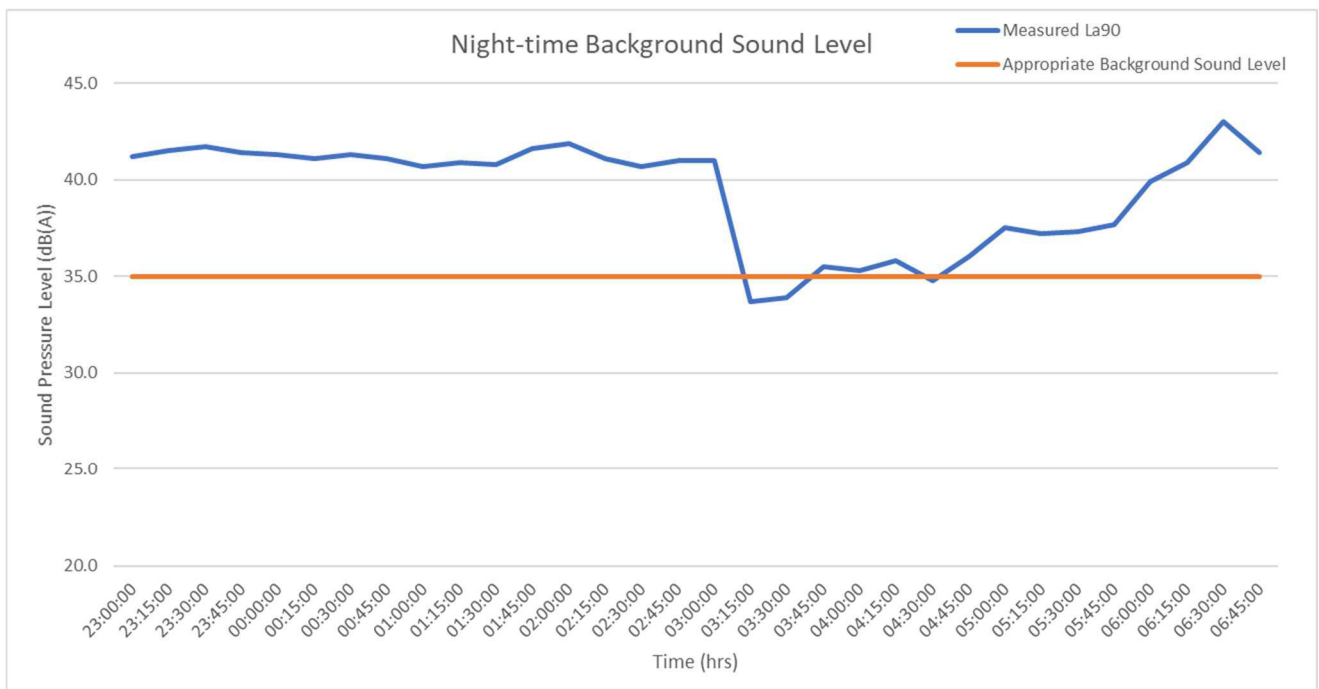
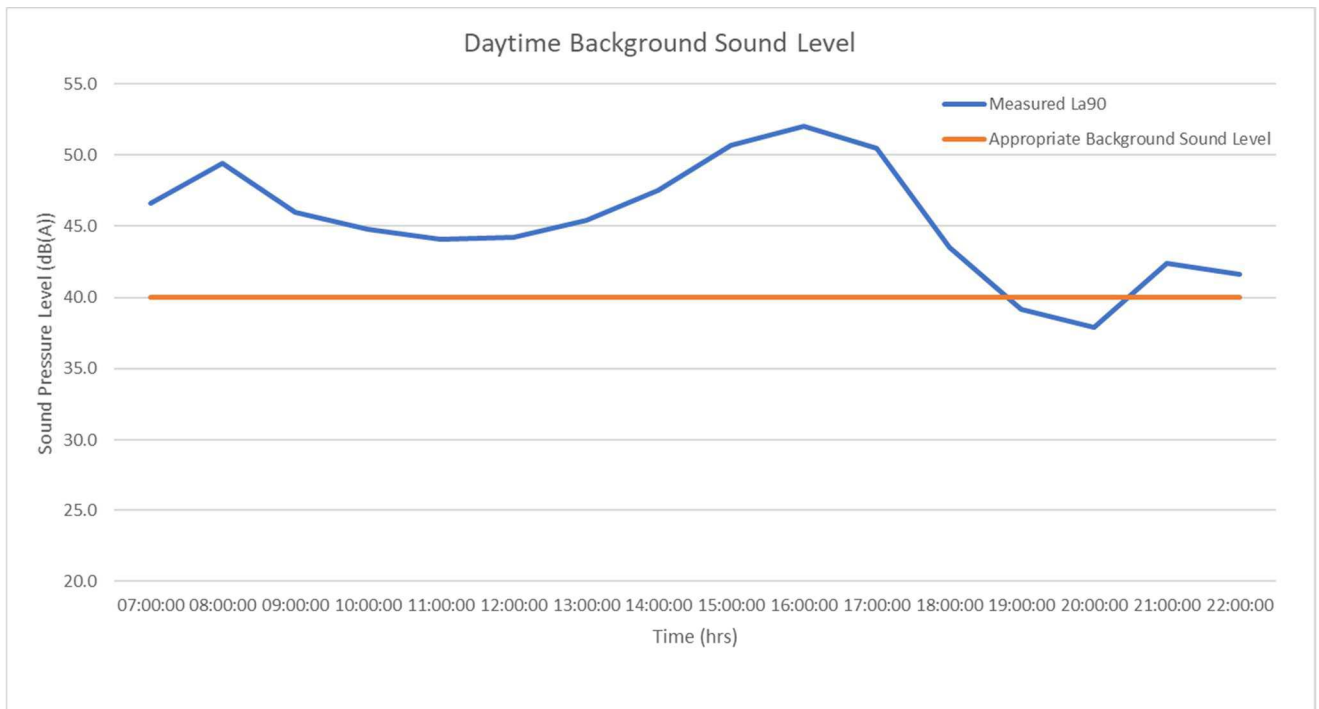
Noise Monitoring Results

Monitoring Location 1 – Northern border of site, approximately 2m from Melksham Road						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
20/01/2022 – Daytime (12:37-23:00)						
1300-1400	67.9	40.0	82.1	45.4	73.5	Unattended
1400-1500	69.5	41.1	83.0	47.5	74.6	
1500-1600	77.2	38.3	105.9	50.7	75.3	
1600-1700	70.7	41.6	82.7	52.0	75.7	
1700-1800	70.7	40.2	85.6	50.5	75.6	
1800-1900	69.3	37.2	89.6	43.5	74.4	
1900-2000	66.6	35.4	81.1	39.2	72.1	
2000-2100	64.4	36.1	81.0	37.9	67.3	
2100-2200	64.9	39.8	83.9	42.4	66.8	
2200-2300	63.4	40.8	82.3	41.6	60.8	
20-21/01/2022 Night-time (2300-0700)						
2300-2315	60.5	40.8	81.7	41.2	51.0	Unattended
2315-2330	54.8	41.2	80.3	41.5	43.7	
2330-2345	54.8	41.4	78.5	41.7	45.0	
2345-0000	53.5	41.1	78.1	41.4	43.3	
0000-0015	54.4	40.7	77.9	41.3	42.9	
0015-0030	58.7	40.7	79.8	41.1	48.6	
0030-0045	58.1	41.0	79.2	41.3	47.8	
0045-0100	55.7	40.6	80.7	41.1	43.0	
0100-0115	41.1	40.5	41.8	40.7	41.3	
0115-0130	57.5	40.4	81.0	40.9	45.0	
0130-0145	48.9	40.1	75.4	40.8	42.2	
0145-0200	56.8	41.3	78.8	41.6	44.4	
0200-0215	55.3	41.5	78.4	41.9	44.9	
0215-0230	54.0	40.9	80.8	41.1	42.5	
0230-0245	56.7	40.1	79.9	40.7	46.4	
0245-0300	41.6	40.9	43.1	41.0	41.9	
0300-0315	41.4	40.7	43.1	41.0	41.6	
0315-0330	58.7	32.8	79.0	33.7	51.1	
0330-0345	56.7	32.1	79.0	33.9	49.1	
0345-0400	55.3	35.0	77.9	35.5	43.0	
0400-0415	57.7	34.8	82.0	35.3	45.0	
0415-0430	59.1	35.3	81.3	35.8	48.8	
0430-0445	53.0	34.3	77.2	34.8	41.0	
0445-0500	59.2	35.5	81.7	36.0	47.5	
0500-0515	62.4	36.4	81.1	37.5	56.5	
0515-0530	62.6	36.6	79.7	37.2	56.5	
0530-0545	63.6	36.6	82.6	37.3	56.5	
0545-0600	63.4	37.2	82.3	37.7	58.4	
0600-0615	64.6	38.2	82.6	39.9	64.6	
0615-0630	65.3	38.1	82.3	40.9	67.5	
0630-0645	66.9	40.0	83.3	43.0	71.8	
0645-0700	67.9	39.1	81.4	41.4	73.4	
21/1/2022 – Daytime (07:00-12:31)						
0700-0800	70.4	42.0	82.5	46.6	75.9	Unattended
0800-0900	71.2	42.6	83.1	49.4	76.4	
0900-1000	70.0	43.5	85.3	46.0	75.5	
1000-1100	69.5	41.9	83.1	44.8	75.1	

1100-1200	69.3	42.4	84.7	44.1	74.6	
1200-1300	68.9	41.8	81.3	44.2	74.3	
Monitoring Location 2 – Eastern site boundary, approximately 360m from Equestrian Centre						
Time	L _{Aeq} (dB)	L _A min (dB)	L _A max (dB)	L _{A90} (dB)	L _{A10} (dB)	Comments
21/1/2022 –Daytime (11:06 – 12:17)						
11:10-12:10	43.9	37.6	57.2	39.8	45.9	Attended

APPENDIX C

APPENDIX C



APPENDIX D

EARLY STAGE OVERHEATING RISK TOOL Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply.

Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes.



KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING

KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map	South east	4	2
	Northern England, Scotland & NI	0	
	Rest of England and Wales	2	
#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	3	0
	Grtr London, Manchester, B'ham	2	
	Other cities, towns & dense sub-urban areas	1	

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context	1	1
---	---	---

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant	Day - reasons to keep all windows closed	8	4
	Day - barriers some of the time, or for some windows e.g. on quiet side	4	
	Night - reasons to keep all windows closed	8	4
	Night - bedroom windows OK to open, but other windows are likely to stay closed	4	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme	1	1
---	---	---

#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels	1	0
---	---	---

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples	3	0
#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures	3	0

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance	1	1
---	---	---

#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans	>2.8m and fan installed	2	0
	> 2.8m	1	

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space	>65%	12	0
	>50%	7	
	>35%	4	

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per #6		Full	Part	0
	>65%	6	3	
	>50%	4	2	
	>35%	2	1	

#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation	Single-aspect	3	0
	Dual aspect	0	

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance	Openings compared to Part F purge rates			0
	Single-aspect Dual aspect	= Part F	+50%	+100%
		minimum	3	4
		required	2	3

TOTAL SCORE **7** = Sum of contributing factors: **10**

minus Sum of mitigating factors: **3**

High

12

Medium

8

Low

score >12:

Incorporate design changes to reduce risk factors and increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12:

Seek design changes to reduce risk factors and/or increase mitigation factors AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8:

Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

DRAWINGS



KEY

- Site Boundary
- Noise Monitoring Locations

Notes:

Boundaries are indicative.
Aerial imagery shown for context purposes only.

REVISION	DETAILS			DATE	DRAWN	CHKD	APPD

GLADMAN DEVELOPMENTS LIMITED

PROJECT
MELKSHAM ROAD, HOLT

DRAWING TITLE
NOISE MONITORING LOCATION PLAN

DRG No. GM12008-001		REV A
DRG SIZE A3	SCALE 1:2,500	DATE 30/03/2022
DRAWN BY EF	CHECKED BY PK	APPROVED BY MD



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