LAND AT BRIDGE ROAD, IMPINGTON

TECHNICAL NOTE – NOISE AND VIBRATION CONSTRAINTS

Project	Land at Bridge Road, Impington

[redacted]

Executive Summary

Main Points for consideration	Required	Further Details
Is noise and vibration a significant constraint?	Yes	Noise from road traffic on the A14. No sources of vibration have been identified.
Are there masterplan considerations?	Yes	Consideration should be given to standoffs and the orientation of dwellings.
Is mitigation likely to be required?	Yes	Consideration to orientation of dwellings, with gardens located on the screened side of dwellings. Localised acoustic fencing and uprated glazing and ventilation are likely to also be required.
Is further work required at feasibility stage?	No	N/A
Is further work required to accompany the planning submission?	Yes	Noise Survey and Assessment

1.0 Introduction

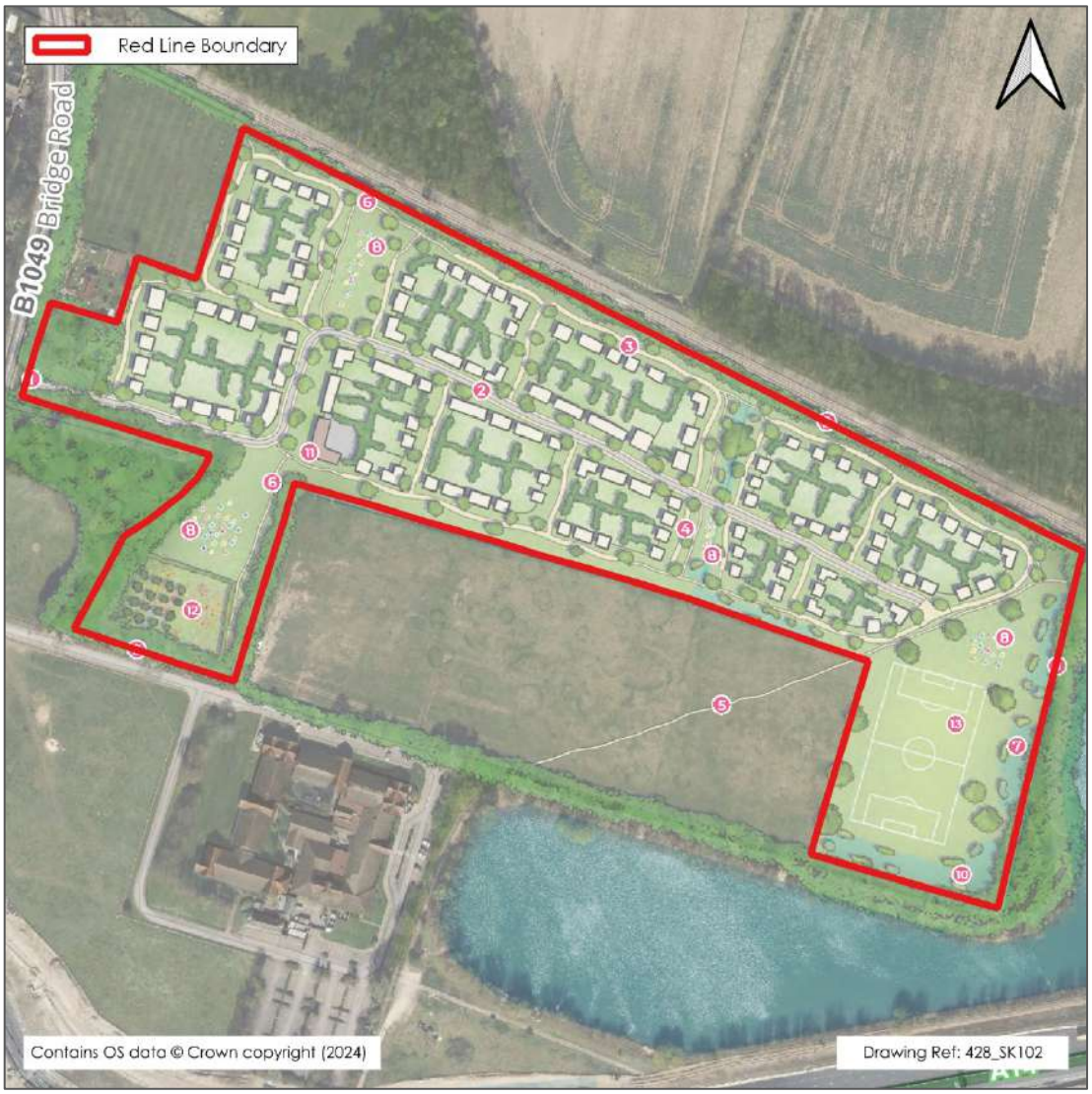
1.1 This statement details a preliminary desk-based noise appraisal for a proposed residential development at land at Bridge Road, Impington. Its purpose is to support proposed future development on the site, through identifying noise constraints and opportunities, and the overall site suitability for residential use from a noise perspective. This technical note provides the results of the constraints review and recommendations for further assessment work required to support any future planning applications.

Site Setting

1.2 The proposed development site is located to the south-east of Impington and comprises agricultural land. The site is bordered to the north by the Cambridge Guided Busway Bridleway, agricultural land, and the Histon Football Club. To the east, the site is bordered by Cawcutts Lake. To the south, the site is bordered by a Holiday Inn, with the A14 beyond. To the west, the site is bordered by Bridge Road with existing dwellings beyond. The site location is shown below in **Figure 1.1**, and the illustrative masterplan is shown in **Figure 1.2**.

Figure 1.1: Site Location

Figure 1.2: Illustrative Masterplan



2.0 Relevant Standards and Guidelines

National Planning Policy Framework (NPPF)

2.1 Published in September 2023, and most recently updated in December 2023, this document sets out the Government's planning policies for England and supersedes the previous NPPF published in 2021. It makes the following reference to noise in the section entitled Conserving and enhancing the natural environment:

> *"180. Planning policies and decisions should contribute to and enhance the natural and local environment by:*
>
> *[…]*
>
> *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions*

such as air and water quality, taking into account relevant information such as river basin management plans."

2.2 It also makes the following references to noise in the Section entitled Ground conditions and pollution:

> *"191. 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[69];*
>
> *b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.*
>
> [69] See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010)."

And

> *"193. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."*

BS 8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings

2.3 This standard provides guidance for the control of noise in and around buildings. The guidance provided within the document is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

2.4 The guidance provided includes appropriate internal and external noise level criteria which are applicable to dwellings for steady external noise sources. It is stated that it is desirable that the internal ambient noise level does not exceed the following criteria set out in **Table 2.1**.

Table 2.1: Summary of Internal Ambient Noise Levels to be achieved in Habitable Rooms when Assessed in Accordance with BS 8233

Activity	Location	Period	
		07:00 to 23:00 Hours, i.e. Daytime	23:00 to 07:00 Hours, i.e. Night-time
Resting	Living Room	35 dB $L_{Aeq,\ 16\ Hour}$	-
Dining	Dining Room/area	40 dB $L_{Aeq,\ 16\ Hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,\ 16\ Hour}$	30 dB $L_{Aeq,\ 8\ Hour}$

2.5 Whilst BS 8233:2014 recognises that a guideline value may be set in terms of SEL or L_{AFmax} for the assessment of regular individual noise events that can cause sleep disturbance during the night-time, a specific criterion is not stipulated. Accordingly, reference has been made in this assessment to the World Health Organisation (WHO) 1999: Guidelines for Community Noise below.

2.6 With respect to external amenity space such as gardens and patios it is stated that it is desirable that the 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. It is then confirmed that higher external noise criteria may be appropriate under certain circumstances such as within city centres urban areas, and locations adjoining the strategic transportation network, where it may be necessary to compromise between elevated noise levels and other factors such as convenience of living, and efficient use of land resource.

World Health Organisation (WHO) 1999: Guidelines for Community Noise

2.7 The L_{AFmax} criterion in BS8233 is largely concordant with the World Health Organisation (WHO) guidance: 1999: Guidelines for community noise. This document draws upon guidance from Vallet and Vernay, which states:

> *"For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45 dB L_{AFmax} more than 10-15 times per night"*

Sport England Design Guidance Note – Artificial Grass Pitch (AGP) Acoustics – Planning Implications, 2015

2.8 The above guidance document expands on the general technical advice already available from Sport England. It provides details of acoustic implications associated with such facilities and follows on from an acoustic research programme involving detailed analysis of relevant noise guidance documents and site testing in a range of locations.

2.9 It proposes appropriate noise criteria and assessment methods and outlines practical measures that can be applied to reduce noise in particularly sensitive areas.

2.10 It refers to the World Health Organisation (WHO) document Guidelines for Community Noise (1999) which provides guidance for outdoor living areas that states that to avoid 'moderate annoyance' during the daytime and evening the noise level should not exceed 50dB $L_{Aeq,T}$. WHO guidelines for residential development are typically calculated

over a 16-hour daytime period. For an artificial grass pitch, a 16-hour assessment period may not truly reflect the noise impact as it considers times of use and non-use. It is suggested an appropriate assessment period is for one hour, $L_{Aeq,1h}$ as this is typically the period for a community sports session on an AGP.

2.11 The document identifies that, from measurement data, a typical free-field noise level of 58dB $L_{Aeq,1h}$ at a distance of 10 metres (m) from the side-line halfway marking has been determined as representative for noise from an AGP. The document goes on to state that, when a site is in an open location, noise levels of 50dB $L_{Aeq,1h}$ can be achieved at a distance of 40m at 1.5m above local ground height.

2.12 The most significant noise levels are generally from voices of the players, however the document recognises that impact noise from balls hitting perimeter fencing is more noticeable. The document recommends a number of mitigation measures that can be implemented to reduce this impact.

3.0 Summary of Baseline Conditions

3.1 A high-level desktop review was undertaken in January 2024 in order to determine the existing noise environment on the Site. The following noise sources have been identified in the local area:

- Road traffic on the A14, Bridge Road and the surrounding road network, including the Cambridge Guided Busway.
- Histon Football Club.

3.2 **Figure 3.1** shows the location of the noise sources identified in the local area.

Figure 3.1: Noise Sources Identified Close to the Site

Operational Phase

3.3 In order to quantify road traffic noise levels across the proposed development site, the latest available DEFRA road traffic noise map[1] has been reviewed. Whilst the mapping is produced at a strategic level and therefore not accurate enough to design against, it does provide an indication of likely noise levels from major road traffic sources.

3.4 **Figure 3.2** shows the 2024 DEFRA daytime (07:00 – 23:00) road traffic contours, and **Figure 3.3** shows the 2024 DEFRA night-time road traffic contours at the Site. DEFRA grid heights are set to 4m above local ground height.

[1] Extrium.co.uk. England Noise and Air Quality Viewer. Available at <http://www.extrium.co.uk/noiseviewer.html> [accessed January 2024]

Figure 3.2: DEFRA 2024 Daytime Road Traffic Noise Map, $L_{Aeq,16h}$

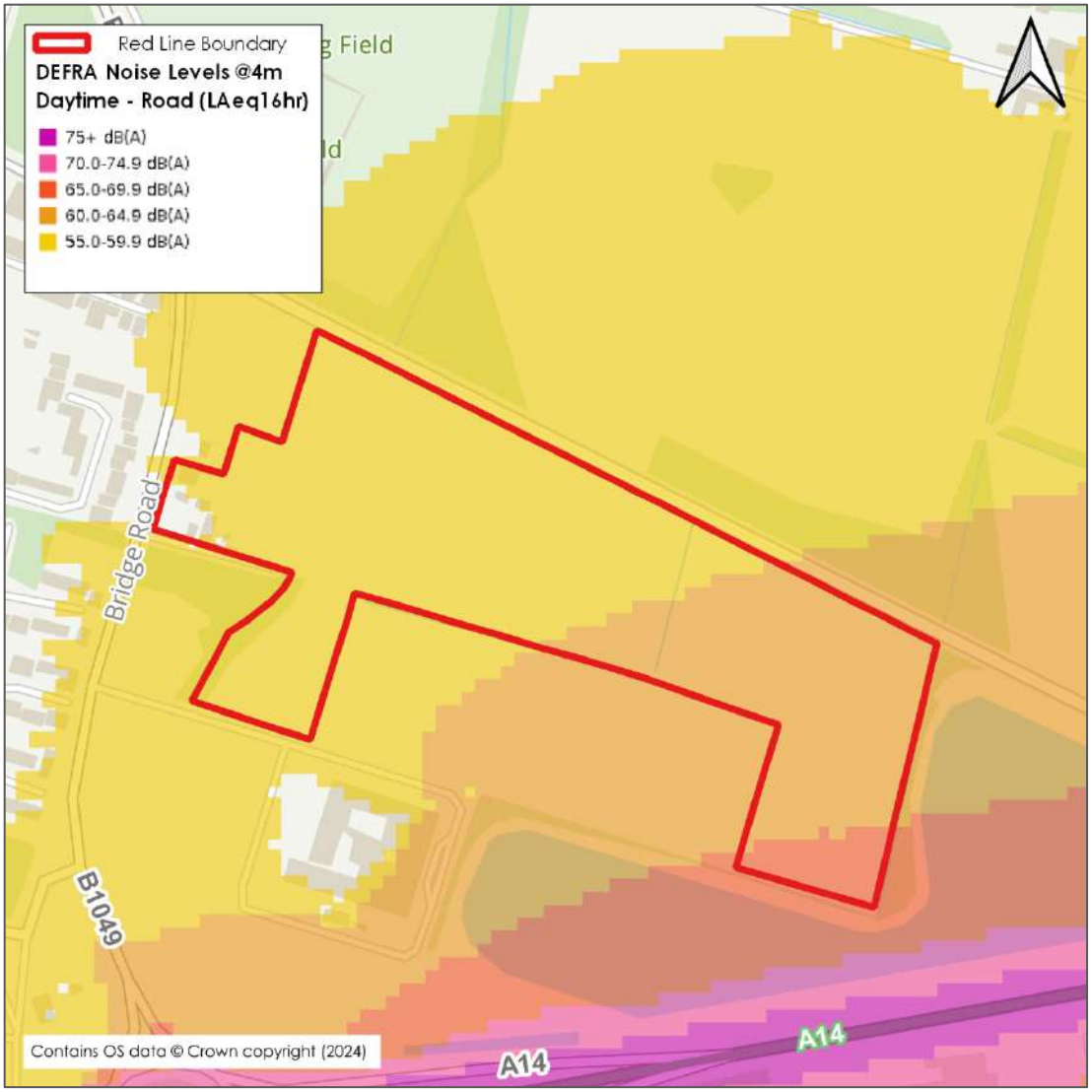
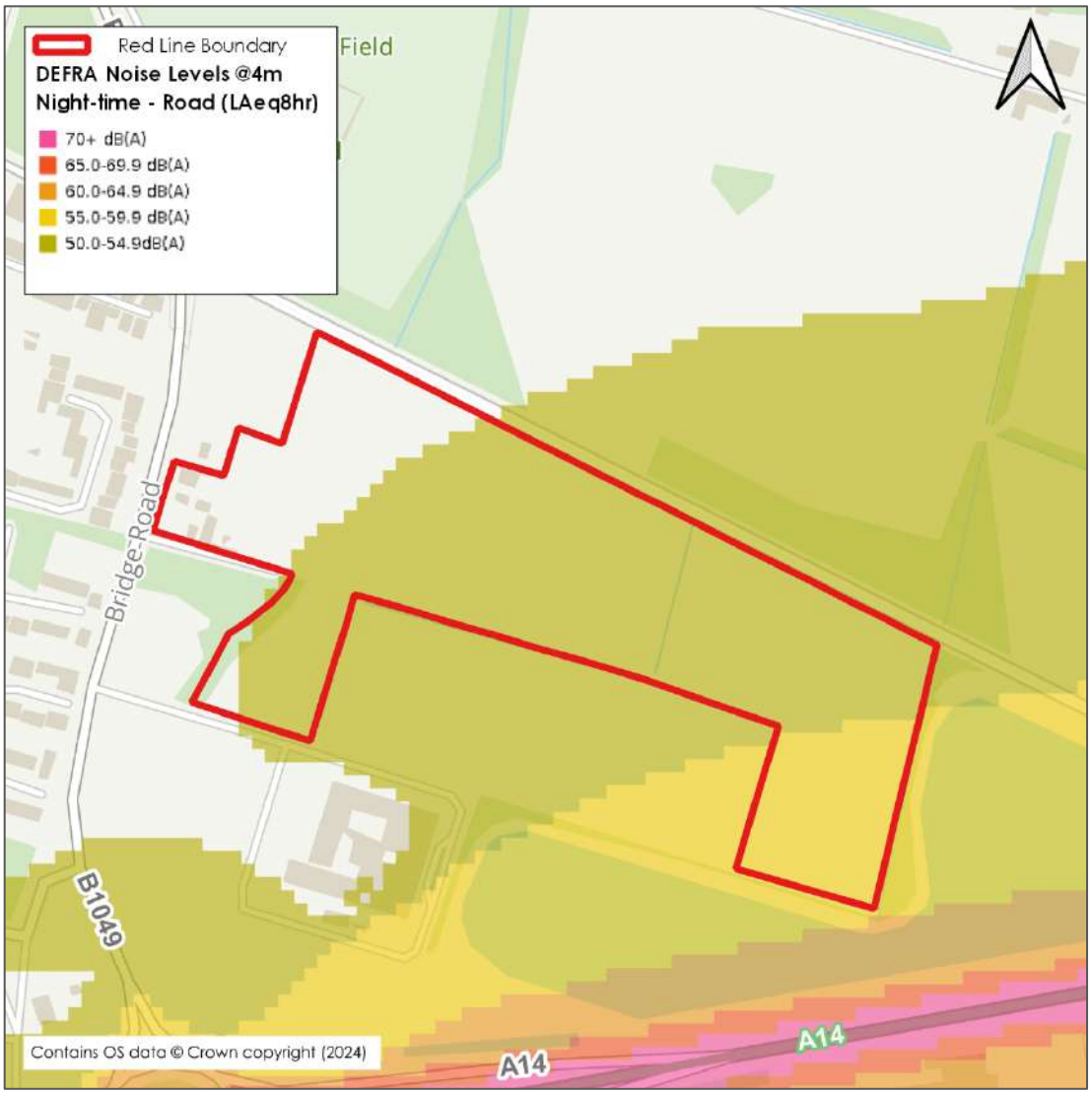


Figure 3.3: DEFRA 2024 Night-time Road Traffic Noise Map, $L_{Aeq,8h}$



3.5 DEFRA noise mapping is not available for Bridge Road and a review of the planning portal indicates that there are no nearby planning applications which have been supported by a noise assessment, where baseline noise levels may be available.

Cambridge Guided Busway

3.6 DEFRA noise mapping is also not available for the Cambridge Guided Busway. A review of online information indicates that buses run between approximately 05:30 and 00:45, with multiple buses expected to pass the site per hour.

Histon Football Club

3.7 A review of online information indicates that the club operates on Tuesday from 18:00 to 22:30, and Saturday from 13:00 to 16:00, however this information has not been confirmed by the club. Histon Football Club's website indicates that they host events such as the Histon Football Club horse race night, however limited information is available on the duration or regularity of these events.

4.0 Potential Constraints to Development

Construction Phase

4.1 The noise and vibration levels generated during the construction phase may cause an impact at nearby sensitive receptors. However, this is likely to be a short-term, temporary impact, and can be controlled through a suitably worded construction environmental management plan.

Operational Phase

Traffic Noise

4.2 **Figure 3.2** indicates that daytime noise levels from road traffic across the majority of the site range from 55.0 to 64.9 dB $L_{Aeq,16h}$, with a small area to the south-east boundary within the 65.0 to 69.9 dB $L_{Aeq,16h}$ range. Therefore, the majority of the site would be above the upper guideline value of 55dB $L_{Aeq,16h}$ as recommended by BS8233 for outdoor living areas. The worst affected areas are located in the south-west of the site closest to the A14, which is currently identified as a proposed sports pitch.

4.3 **Figure 3.3** indicates that night-time noise levels from road traffic across the vast majority of the site are in the range of 50.0 to 54.9 dB $L_{Aeq,8h}$. The south-western portion of the site is indicated to be in the 55.0 – 59.9 dB $L_{Aeq,8h}$ range, however this area is currently not indicated as being for residential use. It is not possible to quantify the L_{AFmax} night-time values at this stage.

4.4 Assuming a 15dB loss through a partially opened window, this would result in the internal noise levels of up to 35dB $L_{Aeq,16h}$ and 30dB $L_{Aeq,8h}$ as recommended in BS8233, being exceeded during the daytime and night-time periods, respectively.

Noise from Cambridge Guided Busway

4.5 Noise data is not available for the Cambridge Guided Busway, however, along nearby stretches of the bus route to the west of the site there are existing houses at a similar distance to those indicated in **Figure 1.2**. Therefore, it is not anticipated that this will be a significant constraint to development from a noise perspective.

Noise from Histon Football Pitch

4.6 To assess the potential noise impact from Histon Football Club, a high-level desktop assessment, taking into account the context of the surrounding environment, has been undertaken based on the typical noise level detailed within the Sport England Design Guidance Note.

4.7 Sport England Guidance provides a typical free-field noise level of 58dB $L_{Aeq,1h}$ derived from measurements undertaken 10m from the side-line halfway marking at a number of sporting activities taking place on AGPs. The document also states that noise levels of 50dB $L_{Aeq,1h}$ can be achieved at a distance of 40m at 1.5m above local ground height.

4.8 The nearest proposed receptor indicated on the illustrative masterplan (shown in **Figure 1.2**) are located approximately 75m south of the southernmost edge of the pitch, and it is considered that the noise level is likely to be approximately 49dB $L_{Aeq,1h}$ at the nearest

façade of the nearest proposed receptor based on a distance attenuation of -3dB per doubling of distance from the edge of the halfway line, which does not take into account any localised screening effects. This is below the lower guideline value for outdoor living areas of 50dB $L_{Aeq,16h}$ as recommended in BS8233 and WHO. Although the typical noise level is calculated 10m from the halfway line, the typical noise level has been assumed at 10m from the end of the sports pitch, closest to the receptors, to provide a worst-case scenario.

Noise Associated with Proposed Sports Pitch

4.9 Noise from the proposed sports pitch has been assessed using the methodology detailed above. The location of the proposed pitch is indicated in **Figure 1.2**.

4.10 The nearest proposed receptor indicated on the illustrative masterplan (shown in **Figure 1.2**) are located at a distance less than 20m to the northmost edge of the pitch, and it is considered that the noise level is likely to be approximately 55dB LAeq,1h at the nearest proposed receptor, which does not take into account any localised screening effects. This meets the upper guideline value of 55dB $L_{Aeq,16h}$ for outdoor living areas of 55dB $L_{Aeq,16h}$ as recommended in BS8233 and WHO.

4.11 When assuming a 15 dB reduction through a partially open window, this results in an internal noise level of 40dB $L_{Aeq,1h}$ which exceeds the internal noise criteria of 35 dB $L_{Aeq,16h}$ for the daytime. Mitigation will therefore be required for the dwellings located closest to the proposed sports pitch.

4.12 The closest existing receptor is a Holiday Inn located approximately 250m to the south-west of the proposed pitch location. It is considered that the noise level is likely to be approximately 44dB $L_{Aeq,1h}$ to the north-eastern edge of the Holiday Inn building as a result of noise from the proposed sports pitch. When assuming a 15 dB reduction through a partially open window, this results in an internal noise level of 29dB $L_{Aeq,1h}$ which is below the internal noise criteria of 35 dB $L_{Aeq,16h}$ for the daytime. Therefore, it is considered that mitigation would not be required to reduce noise from the proposed pitch at the Hotel.

Impact Noise Associated with Proposed Sports Pitch

4.13 Generally, the most significant operational noise on an AGP is the voices of players, however impact noises, such as balls hitting goal backboards and perimeter boards, have the potential to generate higher noise levels. In addition, there can be a difference in the character of that noise in relation to the prevailing existing ambient noise environment.

4.14 Such impact noise can be found to be significantly reduced by the careful design and selection of perimeter fencing. Therefore, it is recommended that, if any fencing is required around the perimeter of the areas, weldmesh fencing is used to enclose them, securely clamped with resilient fixings to avoid vibrations.

5.0 Likely Mitigation and Further Assessment Work

5.1 The development itself could screen existing sections of the village (to the north west of the redline boundary) from the A14 to the south, and therefore could provide a betterment to the existing noise climate at these locations. There may also be an

opportunity to contribute towards environmental enhancement by utilising any excess site materials (where applicable) to create ground bunds around the site.

External Noise Levels

5.2 The noise contours shown in **Figure 3.2** indicate that the upper target noise levels for outdoor living areas of 55 dB $L_{Aeq,16h}$, may be exceeded by up to 15 dB on the southern boundary due to road traffic noise.

5.3 For proposed dwellings located closest to the A14, it is recommended that gardens are located on the screened side of dwellings. In addition, one of the following options are also likely to be required:

- Gaps between dwellings most exposed to the A14 are kept to a minimum to avoids noise creep into the gardens behind e.g. through semi-detached plots and terraces.
- Introduce a standoff between the road and the nearest proposed dwellings. This could include locating less noise-sensitive uses such as the proposed sports pitch on the south west boundary where local noise levels are considered the highest.
- Install an acoustic barrier/bund along the southern perimeter of the development.
- Install localised acoustic barriers around garden areas.

5.4 For areas closest to the Cambridge Guided Busway, Bridge Road, and the proposed sports pitch, careful consideration of Site layout may be required to minimise the requirements of mitigation. However, localised mitigation measures may be suitable in controlling noise where appropriate site design is not possible due to other factors.

Internal Noise Levels

5.5 To ensure that internal noise levels are achieved at proposed dwellings located closest to the A14, a scheme of uprated glazing and acoustically treated ventilation is likely to be required.

5.6 For proposed dwellings located closest to Bridge Road, the guided bus way and the proposed pitch on site and for those dwellings located further into the site, it is likely that uprated ventilation will be required to ensure that recommended internal noise levels are achieved.

Further Work

5.7 A noise impact assessment, including a baseline noise survey is likely to be required to support any planning application for the scheme. The assessment would include consultation with the LPA to understand their specific criteria for an assessment and would allow more targeted advice to be provided with regard to specific mitigation measures and their effectiveness.

6.0 Summary

6.1 For dwellings located closest to the dominant sources of noise, careful consideration will need to be given to the following;

- Site layout.
- Orientation of buildings, in particular placing gardens on the screened side of dwellings.
- Specific boundary mitigation such as a barrier and/or bund.

6.2 It is considered that, with appropriate consideration to site design, mitigation measures and glazing/ventilation choices noise could be adequately mitigated. It is likely that a noise survey and assessment will be required to support the planning application for the scheme.