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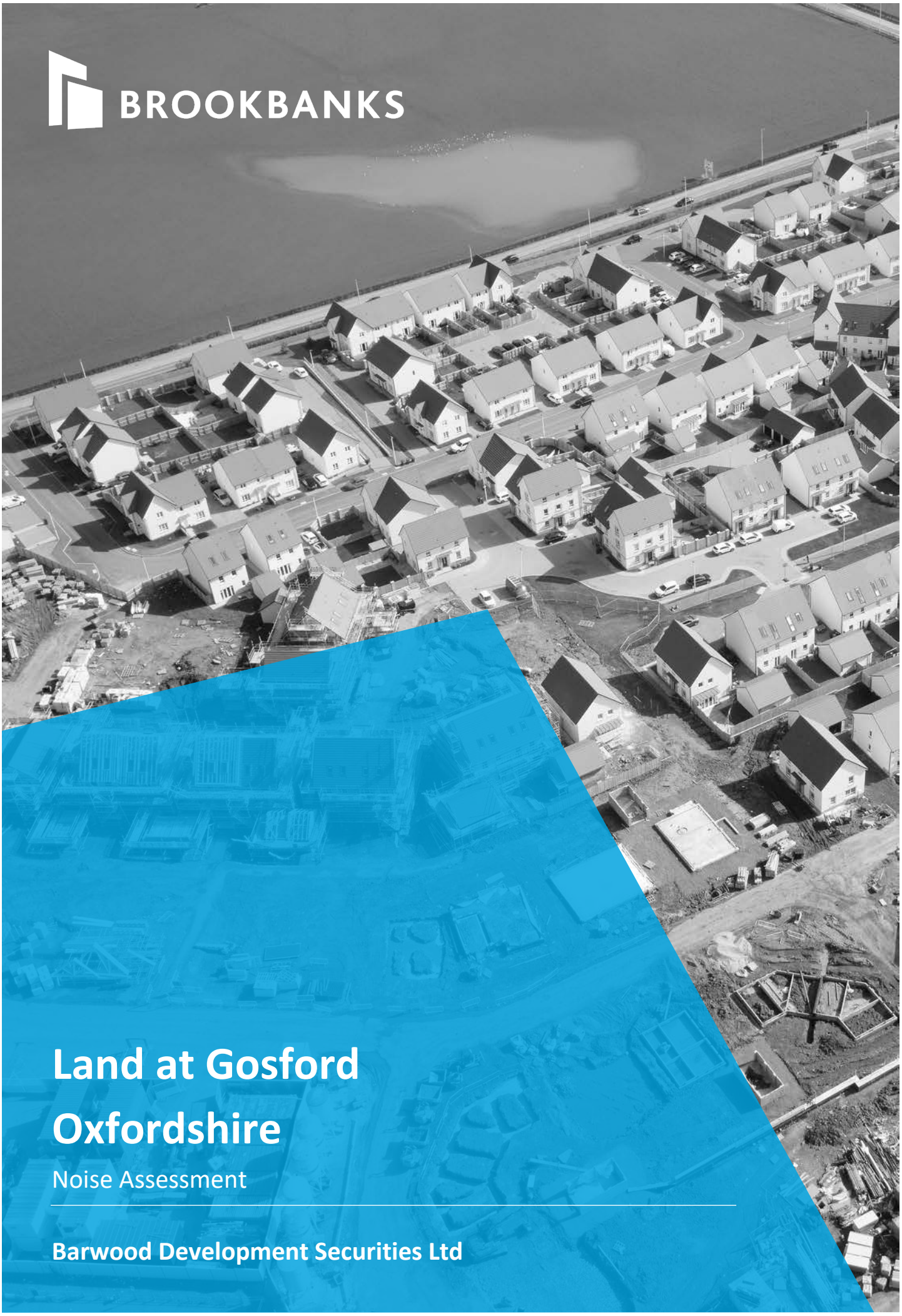

Land at Gosford
Oxfordshire

Noise Assessment

Barwood Development Securities Ltd

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Contents

1 Scheme Overview 4
2 National and Local Planning Policy Background 6
3 Consultation 10
4 Baseline Conditions 11
5 SoundPLAN Model 12
6 Residential Assessment 13
7 Conclusion 17

Figures

Figure 1-1: Development Site 5
Figure 4-1: Existing noise contours 11
Figure 6-1: Future noise contours with development 14
Figure 6-2: Future noise contours with development and noise screening 15

Tables

Table 2-1: BS8233 recommended noise levels 9
Table 6-1: Daytime Façade Modelled Noise Levels (dB) 15
Table 6-2: Night time Façade Modelled Noise Levels (dB) 16

Appendices

Appendix A - Noise Contour Plots

1 Scheme Overview

Introduction

1.1 Brookbanks is appointed by Barwood Development Securities Ltd to produce a Noise Assessment in support of an outline planning application for the development of up to 370 homes, public open space (including play areas and woodland planting), sports pitches and pavilion, drainage and engineering works, with all matters reserved (appearance, landscaping, layout and scale) except for vehicular and emergency accesses to Bicester Road.

1.2 This report has regard to the generated noise from vehicular traffic adjacent to the Application Site. This noise assessment will be used to determine what measures, if any are required to achieve a suitable noise environment for the Application Site.

1.3 Human subjects, under laboratory conditions, are generally only capable of noticing changes in steady noise levels of no less than 3 dB(A). Additionally, environmental noise rarely reaches the sound pressure levels associated with hearing impairment. However, noise can cause annoyance and therefore the potential impact needs to be assessed.

1.4 The following sections of this report will consider the noise environment adjacent to the Application Site in accordance with national noise guidance with the barrier assumed in place.

Site Location

1.5 The proposed site is located to the west of Bicester Road with the A34 located to the east. Open land is located to the north and south. The residential area of Kidlington is located to the west of Bicester Road.

1.6 Oxford is located circa eight kilometres to the south of the development site where there is a range of retail, employment, leisure, and public transport facilities available. The site is located circa 18 kilometres to the north of Abingdon and 12 kilometres south of Bicester, which provides additional employment and retail opportunities.

1.7 The location of the site in its wider geographical context is shown in **Figure 1-1**.

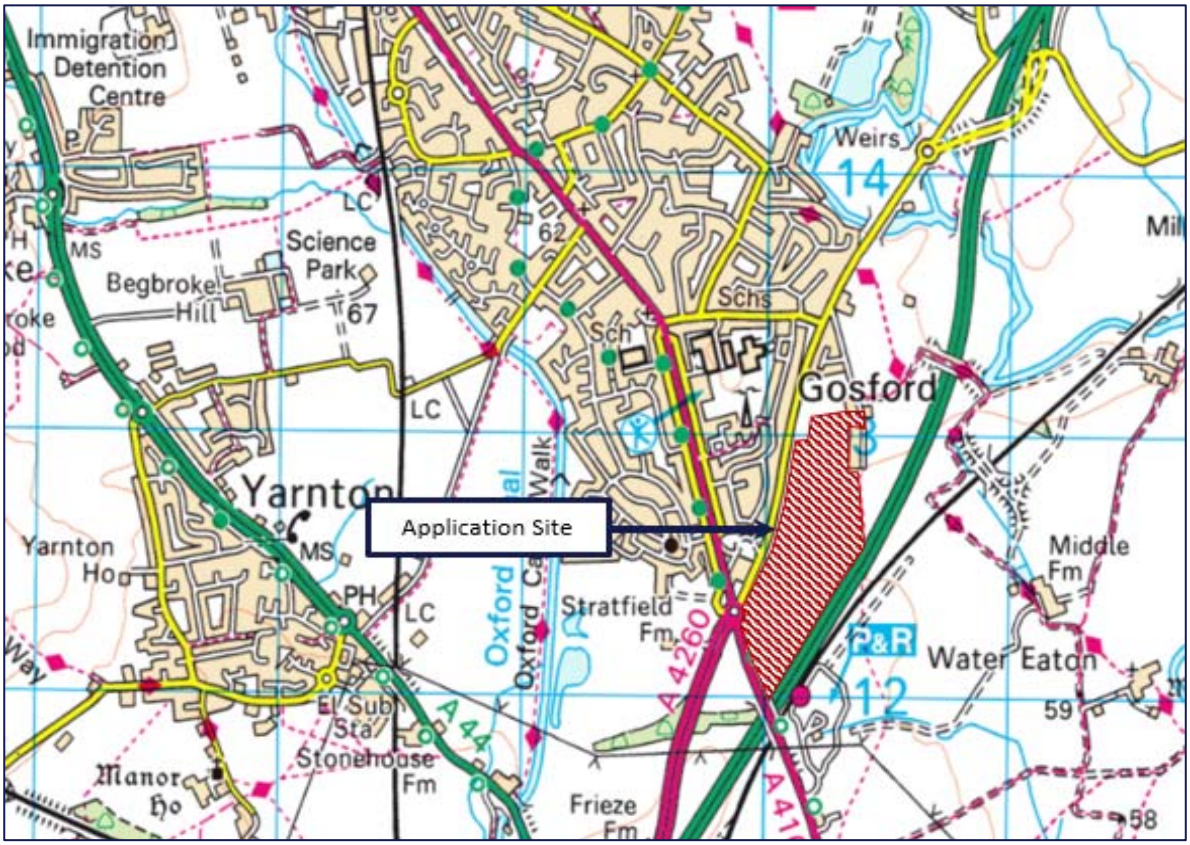

Figure 1-1: Development Site

Development Timescales

1.8 The timescales for development delivery are dependent on many factors, including the planning process and future market demand for housing. However, it is anticipated that the proposed development would commence onsite circa 2023. The development will be constructed over several years, with completion expected 2028/2029.

Assessment Background

1.9 To support the production of the Illustrative Materplan, initial assessments have been carried out to confirm the noise environment across the Application Site. The initial assessments confirmed noise from traffic sources was the dominant noise source, primarily the A34 and Bicester Road. The early findings support the Development Brief, produced by Cherwell District Council, which identifies the need for noise screening along the eastern flank of the Application Site.

1.10 The initial assessments run with several iterations of noise barrier height identified that a 6m high noise barrier would be sufficient to provide an acceptable noise environment across the Application Site. Given the height required, the noise barrier will consist of a 3m high earth bund, constructed with 1:3 slopes together with a 3m fence.

1.11 The purpose of this report is to review the noise environment across the site, highlight the necessary mitigation and to demonstrate that acceptable noise levels can be achieved both internally and externally across the Application Site.

2 National and Local Planning Policy Background

National Planning Policy Framework

2.1 The National Planning Policy Framework (NPPF) sets out the Government's National Planning Policies for England and how these can be applied by local communities when developing their local plans or deciding planning application to best reflect the needs and priorities of the local communities. Current planning law requires Local Authorities to determine planning applications in accordance with the local development plan unless there are material considerations which require them to reach a different decision.

2.2 Paragraph 180 indicates that Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- mitigate and reduce to a minimum potential adverse impact resulting from noise from new development and avoid noise giving rise to significant adverse impacts on health and the quality of life
- identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason

Noise Policy Statement for England

2.3 The Noise Policy Statement for England of March 2010 (Defra 2010) provides a more overarching policy statement on the approach to noise in England. The NPSE provides guidance on the management of noise from sustainable development without placing unreasonable cost or time restraints on sustainable developments.

2.4 The explanatory note of NPSE defines the following terms:

"There are two established concepts from toxicology that are currently being applied to noise impacts. They are:

- *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."*

2.5 The NPSE does not provide a numerical value for the SOAEL, stating at paragraph 2.22:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

2.6 The first aim of the NPSE is:

"Avoid significant adverse impact on health and quality of life"

2.7 To meet the first aim of the NPSE the resultant noise levels as a result of the proposed development should be below the Significant Observed Adverse Effect Level (SOAEL) at the noise sensitive properties.

2.8 The second aim of the NPSE is:

"Mitigate and minimise adverse impacts on health and quality of life"

2.9 To meet the second aim of the NPSE the resultant noise levels as a result of the proposed development should be below the Significant Observed Adverse Effect Level (SOAEL) but above the Lowest Observed Adverse Effect Level (LOAEL) at the nearest noise sensitive properties.

2.10 Third Aim of the NPSE is where possible, the noise levels as a result of the proposed development at the nearest residential property should be lower than the existing noise levels improving the noise climate for the local community.

National Planning Practice Guidance NPPG

2.11 The National Planning Practice Guidance (NPPG) was first published in February 2014. The section entitled "Noise" provides the following general advice and relates to paragraph 123 of the NPPF.

2.12 The main objective is to:

"Identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation."

2.13 A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the NPPG.

2.14 The guidance identifies that the subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. These factors include:

- The source and absolute level of the noise together with the time of day it occurs.
- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise.
- The spectral content of the noise (i.e. whether the noise contains particular high or low frequency content) and the general character of the noise.

2.15 In relation to how noise can be mitigated, this is dependent on the type of development being considered and the character of the proposed location. In general, for noise making developments, there are four broad types of mitigation:

- Engineering: reducing the noise generated at source and/or containing the noise generated.
- Layout: where possible, optimising the distance between the source and noise-sensitive receptors and/or incorporating good design to minimise noise transmission using screening by natural or purpose-built barriers, or other buildings.
- Using planning conditions/obligations to restrict activities allowed on the site at certain times and/or specifying permissible noise levels differentiating as appropriate between different times of day, such as evenings and late at night.
- Mitigating the impact on areas likely to be affected by noise including through noise insulation when the impact is on a building.

2.16 There are further considerations relating to mitigation of noise on residential developments. The noise impact may be partially off-set if the residents of those dwellings have access to:

- A relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;
- A relatively quiet external amenity space for their sole use or a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings;
- A relatively quiet, protected, external publicly accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minutes walking distance).

PR7a Land South East of Kidlington Development Brief (Draft Jan 2022)

2.17 The Cherwell Local Plan 2011-2031 identifies Land South East of Kidlington as one of six strategic housing sites. The Development Brief provides guidance for the planning application. The Development Brief has been jointly prepared between Cherwell District Council, Oxfordshire County Council, landowners and key stakeholders.

2.18 The Development Brief includes a review of the site's context and the site specific development constraints and opportunities. The overall vision is indicated below.

The development site will become an extension to Kidlington that will be fully integrated and connected with the surrounding built environment. It will provide an attractive residential neighbourhood, with high quality, publicly accessible and well-connected green infrastructure and a modern, highly functioning outdoor sports facility.

2.19 The Development Brief identifies;

The principles of good acoustic design are to be followed in the layout and internal design of properties in the south eastern part of the character area, to mitigate the noise arising from the A34 and railway. It is anticipated that an acoustic bund will be required adjacent to the A34 to provide noise mitigation. The design of the bund is to incorporate appropriate native species planting to minimise the visual impact of the bund, with planting either on the bund itself or in a planted corridor adjacent to the bund, and is to ensure that the existing public right of way is retained or if necessary, rerouted in a well-overlooked alignment. The design is to be agreed with CDC's landscape architect.

Noise pollution arising from the Bicester Road should be mitigated by following the principles of good acoustic design. For example, it is assumed that houses at the western boundary of the site should face onto the source of the noise to shield gardens and provide mitigation to rest of the development site.

BS8233:2014: Sound Insulation and Noise Reduction for Buildings

2.20 BS8233:2014 gives recommendations for the control of noise in and around buildings and suggests appropriate criteria and internal noise limits for habitable rooms of residential dwellings.

2.21 The standard goes onto to provide details of the approach to be taken when assessing the design in terms of planning:

- Assess the site, identify significant existing and potential noise sources, measure or estimate noise levels and evaluate layout options
- Determine design noise levels for spaces in and around the buildings
- Determine sound insulation of the building envelope, including the ventilation strategy
- Identify internal sound insulation requirements
- Identify and design appropriate noise control measures
- Establish quality control and ensure good workmanship

2.22 In accordance with the requirements of BS8233:2014, the following internal and daytime noise limits will need to be met within sensitive rooms of the residential dwellings:

Activity	Location	07:00 to 23:90	23:00 to 07:00
Resting	Living room	35dB $LA_{eq\ (16\ hour)}$	-
Dining	Dining room	40dB $LA_{eq\ (16\ hour)}$	-
Sleeping / Daytime resting	Bedroom	35dB $LA_{eq\ (16\ hour)}$	30dB $LA_{eq\ (8\ hour)}$
External Amenity Space	Gardens	55dB $LA_{eq,\ T}$	-

Table 2-1: BS8233 recommended noise levels

2.23 In considering the application of the outdoor criteria, it is important to take account of the feasibility of achieving such a level. A review of 'Health effect-based noise assessment methods: A review and feasibility study' (National Physics Laboratory report CMAM16 HMSO) reported the following:

"Perhaps the main weakness is that they fail to consider the practicality of actually being able to achieve any of the stated values. From the recent national survey of noise exposure carried out in England and Wales that around 56% of the population are exposed to daytime noise levels receding 55dB. The percentage exposed above the guideline values could not be significantly reduced without drastic action to virtually eliminate road traffic noise from the vicinity of houses. The social and economic consequences of such action would be likely to be far greater than any environmental advantages of reducing the proportion of the population annoyed by noise. There is no evidence that anything other than a small minority of the population expose at such noise levels find them to be particularly onerous in the context of their daily lives."

2.24 Due to the difficulty in satisfying the external criteria, the BS provides an over-arching consideration of how to treat outdoor areas:

"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."

3 Consultation

3.1 As part of the assessment process, the Environmental Health Department, Neil Whitton, within Cherwell District Council have been consulted regarding the proposals. This confirmed that traffic noise is the dominant noise source.

3.2 The discussion confirmed that the noise environment should be assessed against BS 8233 Guidance on Sound Insulation and Noise Reduction for Buildings. Specifically, the assessment will consider the following criteria:

- Day time resting: 35dB LAeq (16 hour)
- Sleeping: 30dB LAeq (8 hour)
- External space: 55dB LAeq (16 hour)

3.3 The assessment will use the computer software package SoundPLAN to determine the future boundaries, with the future year being guided by the associated Transport assessment and based on CRTN.

4 Baseline Conditions

4.1 As indicated previously, the proposed site is located to the east of Bicester Road with the A34 located to the eastern boundary. The traffic noise arising from the A34 and Bicester Road is the dominant noise source and will potentially have an impact on the site.

4.2 The current noise conditions are presented below.

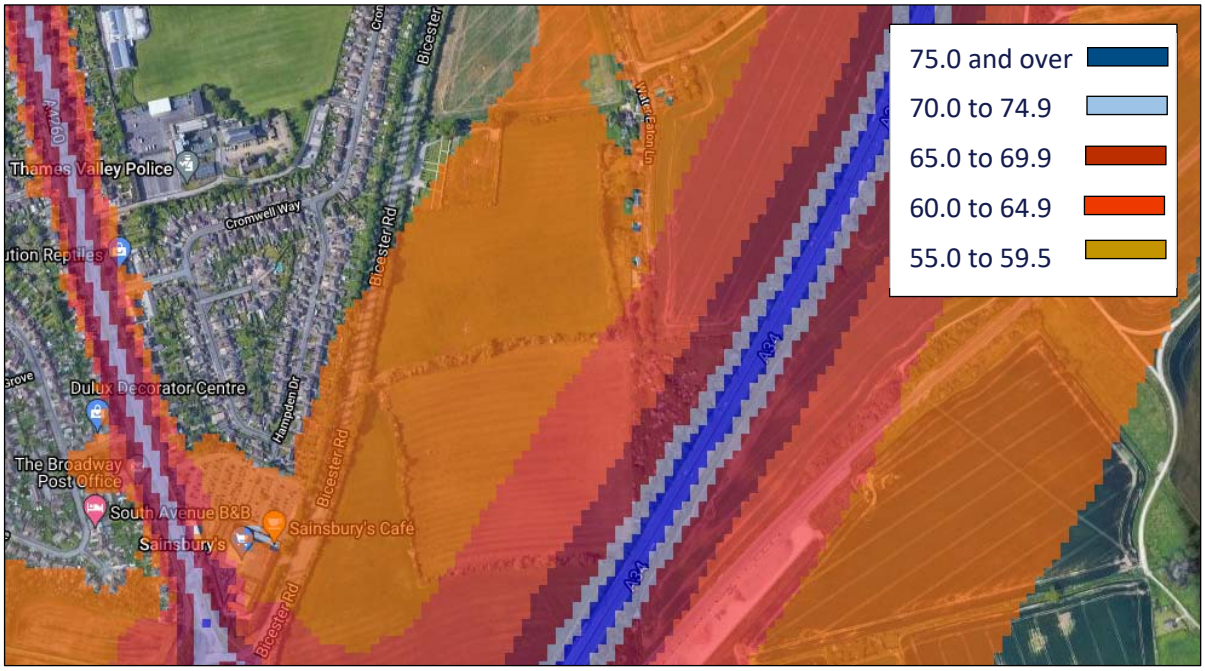

Figure 4-1: Existing noise contours

4.3 The existed noise contours confirm that traffic noise from the A34 is the most dominant noise source, confirming that the site will experience noise levels in excess of 55dB, exceeding the recommended BS8233 external noise levels without any intervention.

5 SoundPLAN Model

5.1 In order to predict the future noise environment across the site, a 3D noise model has been generated through the SoundPLAN computer software package. This was established through the following steps:

- Production of a 3D ground profile
- Confirming location of existing highways
- Defining existing traffic levels
- Confirming future traffic levels
- Confirming location of development

5.2 The 3D SoundPLAN model is then used to predict noise levels across the site.

6 Residential Assessment

6.1 Through consultation with Cherwell District Council, it has been agreed that suitability of the Application Site in relation to noise will be based on the thresholds identified in BS8233. The SoundPLAN 3D noise model has been used to determine the future year ground floor and first floor façade noise levels together with external levels.

6.2 Traditional brick built façades having standard double glazing attenuates the façade noise levels by 33db. Based on the assessment contained in the Defra Report NANR116 (Open/Closed Window Research – Sound Insulation through Ventilated Domestic open Windows) a window that is partially open to provide background ventilation provides approximately 15 dB. Therefore, based on the thresholds contained in Table 2b, acceptable internal noise levels will be achievable with the following façade noise levels:

- Daytime resting with windows closed – 68dB LAeq (16 hour)
- Daytime resting with windows open – 50dB LAeq (16 hour)
- Night time sleeping with windows closed – 63dB LAeq (8 hour)
- Night time sleeping with windows open – 45dB LAeq (8 hour)

6.3 Where façade noise levels exceed the above criteria, habitable rooms (living rooms and bedrooms) may require suitable ventilation systems as an alternative to opening the windows, which could include acoustic trickle ventilators or acoustic air bricks.

BS8233:2014 Assessment of External Noise Levels

6.4 BS8233 indicates that for traditional external areas that are used for amenity space, such as gardens and patios, an upper guideline value of 55 dB LAeq,T is acceptable during the daytime. However, BS8233 also recognises that the guideline values are not achievable in all circumstances, such as city centres or urban areas adjoining the strategic transport network.

6.5 BS8233 identifies that in such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but external noise should not be prohibitive on development delivery.

6.6 A review of the noise environment across the site, as presented below, has indicated that the external noise levels will exceed 55 dB within the residential area of the site.

Figure 6-1: Future noise contours with development

6.7 This demonstrate that the 65db contour extends to the first row of housing adjacent the A34, with façade levels circa 67db. Along Bicester Road, the housing provides sufficient noise screening and shields the rear gardens. The above contour demonstrates that buildings will provide screening but as acknowledged by the Development Brief, gaps in housing will allow the noise seepage into the rear amenity spaces. In order to protect the amenity space, the 6m high screening has been considered and modelled.

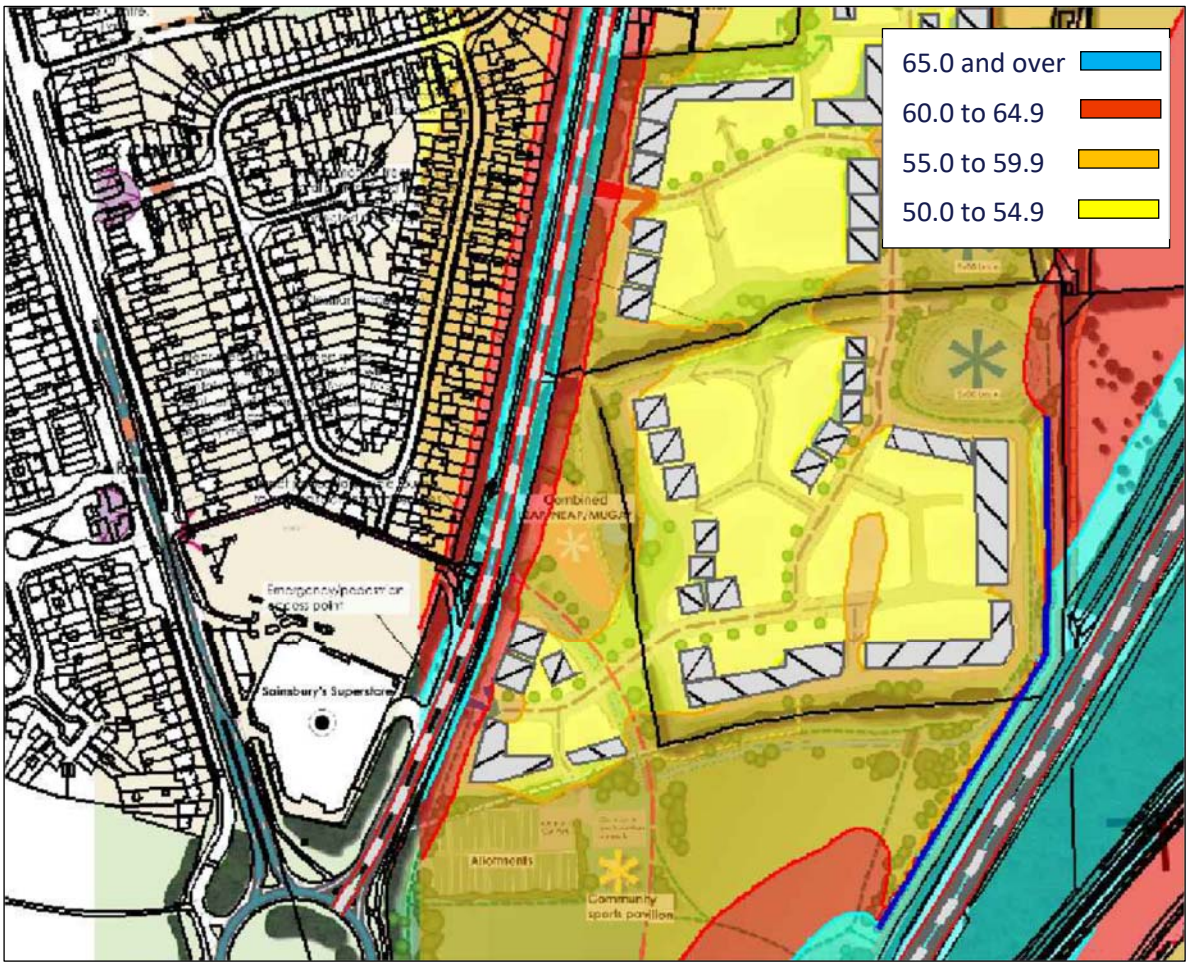

Figure 6-2: Future noise contours with development and noise screening

6.8 The provision of the noise screening provides the necessary protection for the external amenity space.

BS8233:2014 Assessment of Day Time Noise Levels in Living Rooms

6.9 The daytime façade levels predicted by the SoundPLAN model are indicated in **Table 6-1** together with internal levels.

Location	Façade noise level	Internal noise level – closed windows	Internal noise level – open windows
Property adjacent to A34	58.8	25.8	43.8
Property adjacent to Bicester Road	59.5	26.5	44.5

Table 6-1: Daytime Façade Modelled Noise Levels (dB)

6.10 The above assessment clearly demonstrates that with closed windows the BS8233 internal noise levels will be met. However, opening windows for ventilation purposes will increase noise levels. Therefore, alternative means of ventilation for habitable rooms that sight lines onto Bicester Road or the A34 will be necessary.

6.11 It is considered appropriate to consider the use of air brick ventilation and / or trickle vents on the properties fronting the A34 or Bicester Road.

BS8233:2014 Assessment of Night-Time Noise Levels in Bedrooms

6.12 The night-time façade levels predicted by the SoundPLAN model are indicated in **Table 6-2** together with internal levels.

Location	Façade noise level	Internal noise level – closed windows	Internal noise level – open windows
Property adjacent to A34	56.0	23.0	41.0
Property adjacent to Bicester Road	57.4	24.4	42.4

Table 6-2: Night time Façade Modelled Noise Levels (dB)

6.13 The above assessment clearly demonstrates that with closed windows the BS8233 internal noise levels will be met. However, opening windows for ventilation purposes will increase noise levels. Therefore, alternative means of ventilation for habitable rooms that sight lines onto Bicester Road or the A34 will be necessary.

6.14 It is considered appropriate to consider the use of air brick ventilation and / or trickle vents on the properties fronting the A34 or Bicester Road.

7 Conclusion

7.1 This noise assessment has been carried out at a proposed residential scheme on Land at Gosford. A review of the existing noise environment has confirmed that traffic is the dominant noise source, as indicated in the Development Brief.

7.2 The external noise levels across the site have been assessed and modelled. This demonstrates that the external amenity levels exceed 55db. The housing does provide screening benefits however, gaps within the building frontage will allow the noise levels to seep into the wider development. The external amenity area closest to the A34 of the application site will be protected by the provision of a 6m high noise barrier, consistent of a 3m earth bund and a 3m acoustic fence. Housing layout along the Bicester is demonstrated on its own to provide protection to rear amenity space.

7.3 An assessment has been made in accordance with BS8233 which has shown that acceptable internal noise levels can be achieved when windows are closed. Open windows would increase internal noise levels to exceed the BS 8233 thresholds. On that basis, it is suggested that alternative means of ventilation is provided for habitable rooms that have sight lines onto the A34 and Bicester Road.

7.4 This report has demonstrated that the target internal noise levels for bedroom and living/dining areas in accordance with internal ambient levels from the guidance in BS8233:2014 can be achieved.

Appendix A - Noise Contour Plots

Original Drawing Size A3

Construction Design and Management (CDM)
Key Residual Risks

Contractors entering the site should gain permission from the relevant land owners and/or principle contractor working on site at the time of entry. Contractors shall be responsible for carrying out their own risk assessments and for liaising with the relevant services companies and authorities. Listed below are Site Specific key risks associated with the project.

1) Overhead and underground services
2) Street Lighting Cables
3) Working adjacent to water courses and flood plain
4) Soft ground conditions
5) Working adjacent to live highways and railway line
6) Unchartered services
7) Existing buildings with potential asbestos hazards

NOTES:

1. Do not scale from this drawing.
2. All dimensions are in metres unless otherwise stated.
3. Brookbanks Consulting Ltd has prepared this drawing for the sole use of the client. The drawing may not be relied upon by any other party without the express agreement of the client and Brookbanks Consulting Ltd. Where any data supplied by the client or from other sources has been used, it has been assumed that the information is correct. No responsibility can be accepted by Brookbanks Consulting Ltd for inaccuracies in the data supplied by any other party. The drawing has been produced based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
4. No part of this drawing may be copied or duplicated without the express permission of Brookbanks Consulting Ltd.

Signs and symbols

- Line
- Wall
- Emission line
- Surface

Levels in dB(A)

<= 45	
45	50
50	55
55	60
60	65
> 65	

B	Noise model amended	CDW	AE	DS 14.02.22
A	Noise model amended	CDW	AE	DS 21.01.22
-	First Issue	LF	AE	DS 23.11.20

Status	Status Date
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GG	AE	16.11.2020

Scale	Number	Rev
NTS	10669-NM-003	B

Barwood Land

Land At Kidlington
Oxfordshire

Daytime Noise Levels
Future Year with Development
and 6m High Noise Mitigation

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Original Drawing Size A3

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GG	AE	16.11.2020

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NTS	10669-NM-003	B

Barwood Land

Land At Kidlington
Oxfordshire

Daytime Noise Levels
Future Year with Development
and 6m High Noise Mitigation

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