

Noise Baseline Technical Report (AECOM)

Silfield Garden Village

Noise Baseline Technical Report

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Quality information

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Executive Summary

Based on available noise data for the site and acoustic reports produced for a site to further to the west and north of the A11, it is considered that there would be no overriding constraints to the proposed development as shown in Drawing No SIL001-021 with respect to acoustic conditions provided that certain acoustic mitigation measures are incorporated within the scheme. These measures could include provision of an acoustic barrier along the site boundary where residential properties are proposed, and provision of a suitable façade design for the residences.

1. Introduction

This report reviews the information available in the public domain with regards to noise and vibration at the site as shown in drawing No SIL001-024 (appended). This includes publicly available noise mapping data and baseline noise and vibration monitoring reports carried out for relevant local planning applications.

The assessment seeks to identify the potential noise and vibration related issues associated with the development including relevant national, regional and local policies which would need to be taken into consideration and concludes with a summary of constraints, risks and opportunities for the site and recommendations for possible further assessment and mitigation measures that may be required.

2. Noise Policy Guidelines

National Policy

National Planning Policy Framework (NPPF) - 2019

The aim of the NPPF in terms of noise and vibration is to prevent both “new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of..... noise pollution...” (paragraph 170).

Section 15 of the NPPF is concerned with protecting the natural environment, including the matters that should be considered for planning decisions in relation to ground conditions and pollution. This includes ensuring “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 other adverse impacts resulting from noise from new development and avoid noise giving rise to significant adverse impacts on health and quality of life; and
- Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.” (Paragraph 180).

These policies must be applied in the context of Government policy on sustainable development.

Noise Policy Statement for England (NPSE) - 2010

The NPSE seeks to clarify the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The statement applies to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise.

The NPSE sets out the long-term vision of the government’s noise policy, which is to “promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development”.

This long-term vision is supported by three aims:

- “Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvements of health and quality of life.”

The ‘Explanatory Note’ within the NPSE provides further guidance on defining ‘significant adverse effects’ and ‘adverse effects’ using the concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;

- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and
- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

With reference to the SOAEL, the NPSE states:

“It is recognised that 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.”

For situations where noise levels are between the LOAEL and SOAEL, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur.

Planning Practice Guidance - 2019

The Planning Practice Guidance (PPG) “advises on how planning can manage potential noise impacts in new development” and provides guidelines that are designed to assist with the implementation of the NPPF.

The PPG states that local planning authorities should take account of the acoustic environment and in doing so consider:

- “whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.”

Factors to be considered in determining whether noise is a concern are identified including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative effects.

Local Planning Policy

South Norfolk Local Plan - Development Management Policies Document (2015)

The Development Management Policies Document (DMPD) includes the following;

Policy DM 3.13 Amenity, noise and quality of life

(1) Development should ensure a reasonable standard of amenity reflecting the character of the local area. In all cases particular regard will be paid to avoiding:

- a. Overlooking and loss of private residential amenity space
- b. Loss of day light, overshadowing and overbearing impact
- c. Introduction of incompatible neighbouring uses in terms of noise, odour, vibration, air, dusts, insects, artificial light pollution and other such nuisances.

Planning permission will be refused where proposed development would lead to an excessive or unreasonable impact on existing neighbouring occupants and the amenity of the area or a poor level of amenity for new occupiers.

(2) In considering applications which may result in an increase in noise exposure, account will be taken of the operational needs of the proposed and neighbouring businesses, the character and function of the area including background noise levels at different times of day and night and the need to protect areas of rural tranquillity.

(3) Development will not be permitted where the proposed development would generate noise or artificial light which would be significantly detrimental to the amenity of nearby residents or the occupants of other noise sensitive uses. Proportionate mitigating measures including limiting conditions will be used to reduce the potential noise or artificial light impact to an appropriate level whenever practical to do so.

Joint Core Strategy for Broadland, Norwich and South Norfolk (Adopted March 2011, amendments adopted January 2014)

The Joint Core Strategy (JCS) sets out the long-term vision and objectives for the area, including strategic policies for steering and shaping development. Whilst it does not specifically mention noise, Policy 1: Addressing climate change and protecting environmental assets, notes that;

“The environmental assets of the area will be protected, maintained, restored and enhanced and the benefits for residents and visitors improved.

Development and investment will seek to expand and link valuable open space and areas of biodiversity importance to create green networks. Where there is no conflict with biodiversity objectives, the quiet enjoyment and use of the natural environment will be encouraged and all proposals should seek to increase public access to the countryside”.

Other Relevant Guidance

World Health Organisation Community Noise Guidelines (1999)

The World Health Organisation (WHO) ‘Community Noise Guidelines’ recommend external daytime and evening environmental noise limits and internal night-time limits to avoid sleep disturbance.

British Standard 8233:2014

BS 8233 ‘Sound Insulation and Noise Reduction for Buildings - Code of Practice’ provides criteria for the assessment of internal noise levels for various uses including dwellings and commercial properties. It also provides recommendations for external amenity areas such as gardens and balconies.

Professional Practice Guidance: Planning and Noise (2017)

The Institute of Acoustics, the Association of Noise Consultants, and the Chartered Institute of Environmental Health have jointly produced Professional Practice Guidance (ProPG) which focusses on noise-sensitive development. The ProPG has been produced to provide acoustics practitioners with guidance on a recommended approach to the management of noise within the planning system in England. ProPG provides planning guidance for the consideration of new residential development that will be exposed predominantly to airborne noise from transport sources. The document provides advice on how guidance within BS 8233:2014 and WHO Guidelines for Community Noise may be applied to improve in the consistency and quality of plan-making and decision-taking in relation to acoustic matters.

Supplementary Document 2 ‘Good Acoustic Design’ which accompanies the main ProPG document provides a hierarchy of noise management measures that Local Planning Authorities should encourage, including the following, in descending order of preference:

- i. Maximising the spatial separation of noise source(s) and receptor(s).
- ii. Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.
- iii. Using existing topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.
- iv. Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.
- v. Using the layout of the scheme to reduce noise propagation across the site.

- vi. Using the orientation of buildings to reduce the noise exposure of noise-sensitive rooms.
- vii. Using the building envelope to mitigate noise to acceptable levels.

3. Existing and Future Noise Environment

The noise environment at the site is influenced by traffic sources, in particular from the A11 trunk road, but also from traffic on Silfield Road and Sutton Lane and train noise from the rail line to the west. The rail line runs between Cambridge and Norwich.

No information is available in respect of future noise levels but in order for traffic noise levels from the A11 to increase by 3dBA would require two-way traffic flows to double. It is considered that such an increase of traffic on the A11 is unlikely in the short term so noise from the A11 will remain similar to current levels.

It is understood any scheme to develop the site would involve creation of a new junction off the A11 and entail creation of new roads through the site. The impact of these changes to the road network are not considered in this constraints review but would require consideration in the layout of the site for any future planning application.

4. Baseline Noise Levels

A noise survey was undertaken close to the site area in November 2010 to inform a planning application for a site to the north of the A11 and either side of Silfield Road¹. Measurements were made at two locations: P1 (approximately 19m from the A11 and to the east of Silfield Road) and P2 (approximately 16m from the A11 and to the west of Silfield Road). The measured noise levels were reported as follows:

Table 1. A11 Noise Levels

	Daytime	Night-time	
	L _{Aeq,16hr}	L _{Aeq,8hr}	L _{Amax}
P1	74dB	66dB	80dB
P2	80dB	74dB	88dB

Further measurements were undertaken for a planning application (Reference 2012-0371 – Land to the east and west of Rightup Lane). Noise levels close to the A11 were typically 78dB L_{Aeq,T} and 82 to 92dB L_{Amax}. Noise levels were also reported at 25m from the rail line due to individual train pass-bys. These are as follows:

Table 2. Train Noise Levels

Train Class	Time	Number	SEL dBA at 25m
158	1025-1602	13	78.5
170 (decelerating)	1053-1550	6	72
170 (accelerating)	1115-1618	6	79.6
Freight	1619	1	88

Noise data for the A11 is also available from a publicly accessible website <http://www.extrium.co.uk/noiseviewer.html>.

Figure 1 presents the current daytime L_{Aeq} noise levels and Figure 2 the night-time L_{Aeq} noise levels.

¹ Land North of the A11 at Park Farm, Silfield Road. Up to 500 dwellings. Developer: Pelham Holdings Ltd. South Norfolk District Council planning application reference number: 2011/0505.

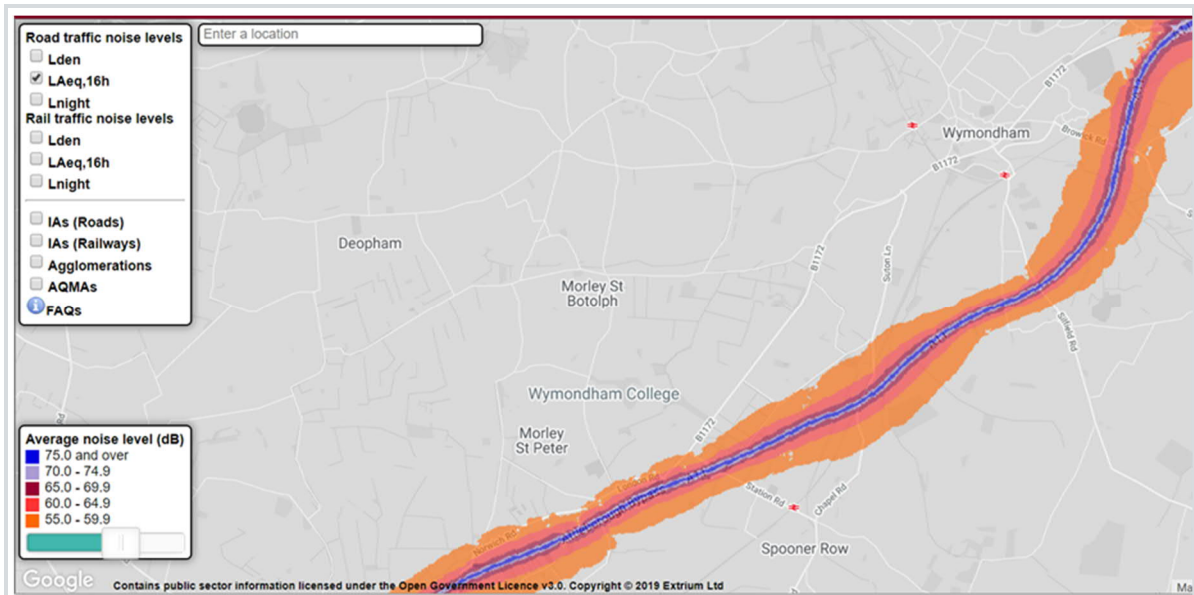


Figure 1. Daytime Noise Levels



Figure 2. Night-time Noise Levels

5. Noise Criteria

British Standard (BS) 8233:2014 'Guidance on sound insulation and noise reduction for buildings' provides recommended criteria for internal ambient noise levels when rooms are unoccupied, dependent on their intended use. Table 3 presents the desirable internal noise levels that should not be exceeded in new residential developments.

Table 3. Target indoor ambient noise levels (BS 8233)

Activity	Location	Daytime (07:00 to 23:00)	Night-time (23:00 to 07:00)
Residential			
Resting	Living room	35 dB $L_{Aeq,T}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16h}$	30 dB $L_{Aeq,8h}$

Regular individual noise events at night have the potential to disturb the sleep of inhabitants in dwellings. BS 8233 states that: "A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night".

The World Health Organisation (WHO) Guidelines for Community Noise provides guidance on noise levels for single noise events that may cause sleep disturbance by stating: "To avoid sleep disturbance, indoor guideline values for bedrooms are 45 dB L_{Amax} for single sound events".

Furthermore the Professional Planning Guidance: Planning and Noise (ProPG) states that "In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night".

BS 8233 also provides recommendations for noise levels in external amenity areas. 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.

6. Opportunities and Risk

Road Traffic Noise

Noise levels along the A11 are very high. To achieve acceptable internal noise levels in dwellings would require sound reduction of up to 45dBA if constructed within 16m of the road. Whilst this would be achievable with high performance double or secondary glazing, mechanical ventilation would be likely to be required. Daytime noise levels would need to be around 60dB L_{Aeq} for thermal double glazing (4-16-4) and non-acoustic trickle vents to provide a suitable level of sound reduction. This level of noise currently extends approximately 140m into the site.

Noise levels with windows open would be unacceptable for anything but short term 'purge' ventilation. Based on a typical sound reduction of 10-15dB through a partially open window, it would not be possible to rely on open windows for ventilation or cooling purposes where external noise levels exceed around 47dB L_{Aeq} during the day and 42dB L_{Aeq} /57dB L_{Amax} at night (although some relaxation of this may be acceptable if overheating only occurs for limited periods).

The following Table considers a living room in a typical brick built dwelling with standard punched windows.

Table 4. Preliminary Facade Requirements

Glazing type	Glazing Configuration (glass/airgap/glass)(mm)	Ventilation	Maximum external noise level	Approximate Distance from A11
Standard double glazing (Rw 31dB)	4/16/4	Non acoustic trickle vent	60dB L_{Aeq}	140m
Standard double glazing (Rw 31dB)	4/16/4	Acoustic trickle vent	65dB L_{Aeq}	60m
Moderate performance glazing (Rw 38dB)	6/16/6.8 (lam)	Mechanical ventilation	70dB L_{Aeq}	30m
High performance (Rw 41dB)	6/16/10.8 (lam)	Acoustic trickle vent	70dB L_{Aeq}	30m

The distance of 140m in the Table above is taken from the online noise map where the 60dBA noise contour is approx. at the junction of Swallow Drive and Robin Grove. Closer to Silfield Road where the A11 is in the deepest part of the cutting the 60dBA contour is approx. 100m from the A11. At the other end of the site the 60dBA contour is approx. 180m from the A11, where Wymondham Road is crossed by the railway.

The 55dBA contour extends 200-400m into the site. This is the noise recommended as the upper guideline level for external residential amenity. A 3 metre barrier at 15m from the A11 should provide sound reduction of around 14dBA at 30m from the A11 at ground level. A 3 metre barrier should therefore just reduce levels down to the upper guideline level. The foregoing assumes flat ground. Where the A11 is in a cutting, the 3m barrier would provide more benefit, approx. 20dBA sound reduction assuming the cutting is around 3 metres deep, i.e. if the A11 is 3 metres below the site ground level.

This amount of sound reduction would mean the glazing and ventilation requirements of the dwellings at 30m from the A11 is reduced to standard glazing and vents (at ground level). The same 3m barrier would provide 8dBA sound reduction at 4 metres above ground level (bedroom window height). It should therefore be possible for the bedrooms to have standard double glazing but they would need acoustic trickle vents.

All of the above assumes windows remain closed and ventilation is via trickle vents only. If windows need to be opened for additional ventilation e.g. for cooling, internal noise levels would be exceeded.

It is worth highlighting the hierarchy of noise management highlighted in the ProPG guidance which lists façade design as the least preferred measure for mitigation. Other methods of noise management should be given priority.

Careful consideration should be given to site layout and orientation of buildings. Preference should be given to locating least noise sensitive buildings close to the A11. Consideration should also be given to using buildings as noise barriers where possible. It should be noted, any gaps between buildings will reduce the effectiveness of this approach.

Building layouts can be designed so that the less sensitive rooms are on the noisiest façade. This can include bathrooms, corridors, stair and lift cores. Kitchens should not normally be considered to be non-noise sensitive, particularly if they lead to a living area.

Given the hierarchy of mitigation in ProPG, it would be considered good acoustic practise to introduce the acoustic barrier which will result in reduced noise levels across the site, rather than relying on facade treatment alone. From Figure 1 above, the 55dBA noise contour extends between approximately 200m and 400m into the site. Beyond this distance, ambient levels would be acceptable for external amenity areas. Some form of acoustic barrier would be required to reduce the noise levels for areas closer to the A11. This could comprise a solid timber or concrete barrier or an earth bund. Initially a barrier of around 3 metres is recommended. An earth bund may be preferable from aesthetic view point but would require a larger footprint than a fence or wall. There are a number of proprietary 'green barriers' which would require a smaller footprint yet still be visually less obtrusive.

Having reviewed a report submitted to discharge planning conditions² in respect of the residential development further to the east which spans Silfield Road to the north of the A11 (Ref 2011/0505/O and 2015/1649), the local planning authority will require an acoustic barrier along the site boundary with the A11 where residential properties are proposed as is indicated in the most recent masterplan.

Train Noise

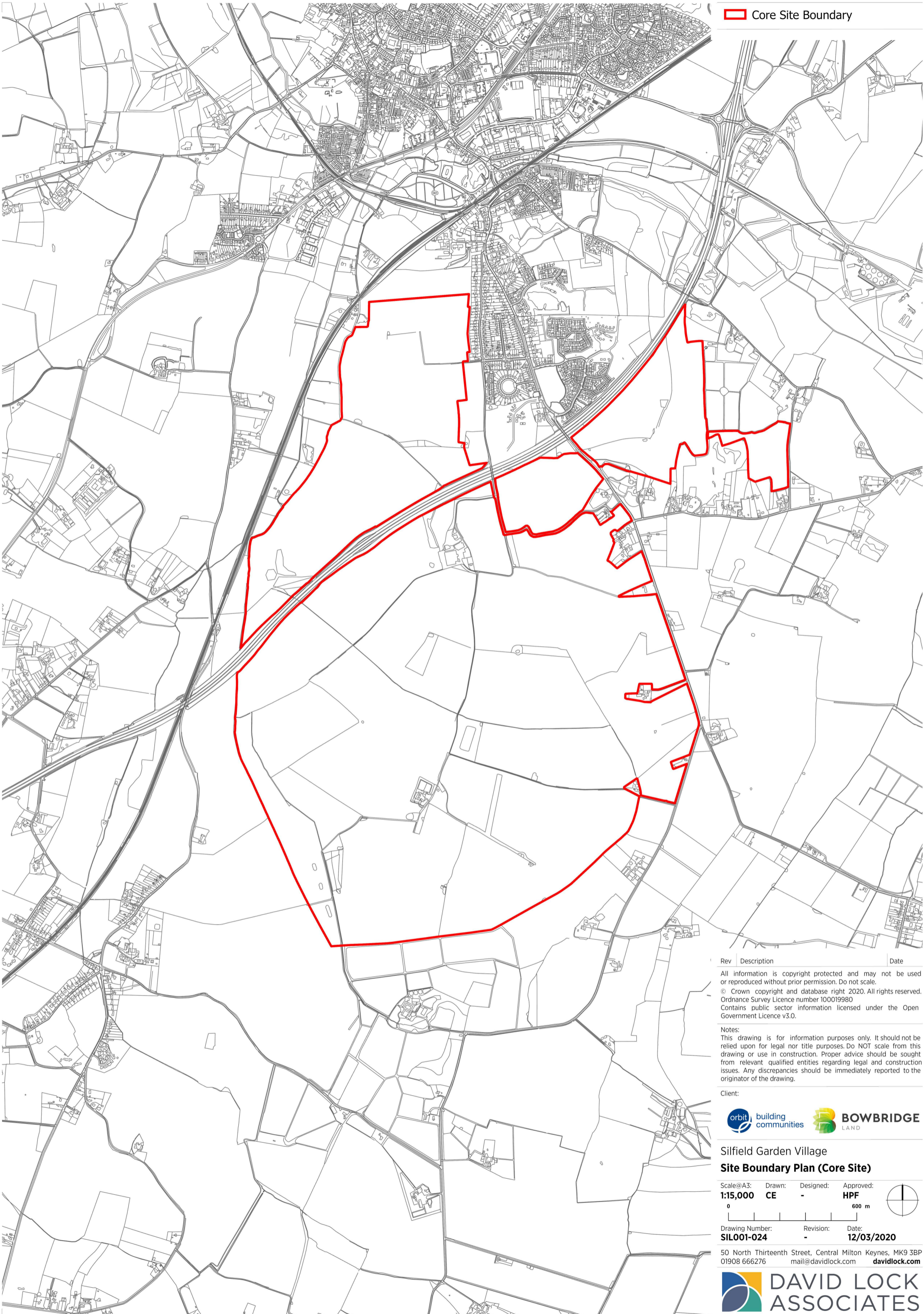
Based on the measured SEL noise at 25m from the rail line, the calculated LAeq,6hr noise level is 50dB within the site boundary. This should not result in any adverse noise impacts and acceptable internal noise levels should be readily achievable. However, the existing baseline information does not provide the L_{Amax} noise levels due to train pass-bys and these would still need to be considered for sleep disturbance.

7. Conclusion

² Report No 70016945, Land North of the A11, Wymondham, Noise Assessment – WSP June 2016

A combination of acoustic barriers along the A11, consideration of site layout and building orientation should result in acceptable acoustic conditions for the site. This could be assessed further with noise modelling of the masterplan.

Core Site Boundary



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Client:



Silfield Garden Village
Site Boundary Plan (Core Site)

Scale@A3: 1:15,000
Drawn: CE
Designed: -
Approved: HPF
0 600 m



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